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Effect of educational attainment on the preferred number of children among women in Kenya: Evidence from the 2022 Kenya demographic health survey dataset

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ABSTRACT

This research paper discusses how educational attainment influences the desired number of children in Kenyan women using the recent Kenya Demographic Health Survey (2022) data. The theory applied in this study was the Human Capital Theory (HCT). The research design was a cross-sectional research design because the authors examined the data of 32,152 women aged 15-49 years and 42,022 households in Kenya. Validated questionnaires were used to collect data, which was pre-tested and reviewed by experts. The analysis was conducted by univariate (descriptive), bivariate (correlation), and multivariate (multiple linear regression) analysis, factoring in variables like age, wealth, and use of contraceptives. Findings of the regression model have shown that increasing educational attainment leads to a significant decrease in the preferred number of children of 0.15 children per school year of education (P<.001), even with the controlled variables. Univariate analysis revealed that the sample had a mean of 2.41 children, 8.7 years of schooling, and a mean age of 29 years. Bivariate analysis revealed that educational attainment and the number of children had a significant negative relationship ($r = -0.438$, $p < .001$), and age and marital status had a positive relationship with fertility. Even after controlling for the confounders, it was confirmed that higher education was a significant source of the preferred number of children decreasing by 0.15 per additional year ($\beta = -0.2679$, $p = 0.001$). Diagnostic tests proved that the statistical assumptions held. These results are in line with the international evidence that education enables women to become strong, enabling them to have more reproductive health knowledge and have low fertility preferences. The article highlights the importance of education in the development of preferences of family size and the facilitation of informed reproductive decisions. It suggests that more funding should be devoted to the education of women to contribute to sustainable population development and gender equity in Kenya.

Keywords: Educational Attainment, Fertility Preferences, Family Planning, Kenya Demographic and Health Survey, Reproductive Health

I. INTRODUCTION

Education plays a key role in determining individuals' attitudes and behavior towards reproductive health and family size. It has been proven that higher education, particularly among women, correlates with lower levels of fertility and higher educated fertility preferences (Berrington & Pattaro, 2014). Education tends to liberate women, enabling them to access information and knowledge that allows them to make the right decisions regarding their reproductive health, such as the age of marriage, the number of children they wish to have, and birth spacing. In Kenya, significant progress has been made in promoting access to education at various levels, including increased enrollment rates and improved educational attainment among the population. However, disparities persist, particularly in rural and disadvantaged communities, where educational quality is a significant issue (Johannes, 2010).

The ideal number of children among women in developed countries is a widespread phenomenon influenced by various socio-economic, cultural, and individual factors. Overall, the higher the level of education, the lower the number of children per woman (Gietel-Basten et al., 2022). Advanced education levels are often associated with delayed childbearing. Individuals pursuing advanced education typically invest more years developing their careers and themselves before they become mothers. This delay is equivalent to fewer children during the course of a woman's reproductive years. Australia has seen increasing levels of education attained over time, particularly among women, as

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noted by Uddin (2016). Increasingly, more people are pursuing tertiary education, with more obtaining university qualifications or vocational qualifications. In fact, the country boasts an inverted population pyramid that indicates that the population of adults exceeds the population of youths.

China had a strong impact on reducing the birth rate and the perception of the number of children in a family. Even after the policy was softened to permit two children, couples still had a preference for fewer children because they had habits deeply ingrained and due to economic reasons. According to Zhang (2017), the transition towards a two-child policy back in 2016 was geared towards addressing the aging and declining labor force. However, the response has been slower, with couples citing financial constraints and not desiring more children. The concept of fertility desire among female women in Middle Eastern countries like Qatar and Jordan also takes shape under a combination of cultural heritage, economic context, and social changes (Department of Statistics, 2024; Ministry of Development Planning and Statistics, 2020). Even though traditional values continue to assign great importance to large families, increasing female education and participation in the labor force are driving the trend of decreasing family sizes (Lari et al., 2021).

South Africa Department of Health et al., (2019) confirmed that women who are educated are likely to marry later and to have fewer children. Even though work and education are very important determinants of fertility desires, society and culture have expectations. South Africa has varying cultural practices and histories that shape the ideal family sizes. Some communities believe in large families and perceive these families as a source of social support and economic. But as women become more available to higher education and employment, these cultural norms also begin to change over time (Moultrie & Timaeus, 2003). In developing countries, educational attainment among women varies from rural to urban regions and from poor to wealthy families. Ushe (2011) contends that cultural and religious beliefs closely favor high family sizes in countries like Nigeria.

The population of Kenya has been increasing at an extremely high rate until recently, and the estimates put it at a population of more than 50 million people (KNBS, 2019). However, as this expansion has occurred, the overall fertility rate (TFR) has continued to decrease over the years, with an average of about 8 children per woman in the 1970s to about 4 children per woman in recent years. According to Kibet and Mutai (2018), this is a result of the multiplicity of factors that include urbanization and access to better family planning interventions, as well as shifting socio-cultural norms. Of interest is how the number of children in the families of the more educated members of the family has drastically declined. The Kenya Demographic and Health Survey (KDHS) of 2022 offers good evidence on fertility intentions of women in Kenya. According to the survey, the Total Fertility Rate of Kenya is now 3.4 children per woman which is a tremendous decline over the last few decades (KNBS et al., 2023).

1.1 Statement of the Problem

The statistics presented by the 2022 KDHS show that fertility preferences of Kenyan families have changed, particularly the number of children in the family, the preferred sex of a child, and the birth spacing. The overall fertility rate in 2022, according to the report, is 3.4 children per woman compared to 3.9 children per woman in 2014. Other statistics (KNBS et al., 2023) depict that the education levels of the Kenyans have improved and that most Kenyans are joining higher levels of education. This is because the proportion of women lacking any education has decreased, from 13 percent in 2003 to 6 percent in 2022. At the same time, the proportion of women with a higher education level than secondary education rose to 19 (KNBS et al., 2023). Kibet and Mutai (2018), examined how schooling affected the differentials in fertility in Kenya. They argued that education led to a decline in fertility, but more so among women than among men. This reveals the necessity to address the issue of gender inequality in education to achieve drastic decreases in levels of fertility. The previous researches indicate that education, especially the education of girls, is one of the methods of lowering the fertility rate to achieve sustainable development in Kenya. There is, however, no certainty that the shifts are being induced by the educational attainment of couples and this is the reason why this study has been conducted.

1.2 Research Objective

To determine the effect of educational attainment on the preferred number of children among women in Kenya.

1.3 Research Hypothesis

$H0_1$: Educational attainment does not significantly affect the preferred number of children among women in Kenya.

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II. LITERATURE REVIEW

2.1 Theoretical Review

The theory applied in this study was the Human Capital Theory (HCT). The theory presupposes that education increases the productivity and revenue-generating capacities of people, which affects most of their life topics, such as family size and the decision to have children and at what stage (Becker, 1964). The interdependence between education and fertility desires in Kenya should be understood in a country where the impact of fertility levels on socioeconomic growth is significant and the level of education is very heterogeneous.

The Human Capital Theory suggests that the greater the level of education, the later childbearing can be deferred since an individual puts investment in his career and other forms of human capital as a priority. A study conducted by Bankole and Malarcher in the year 2010 revealed that women with a higher education in countries like Kenya and other sub-Saharan countries delay bearing children and bear fewer children than their less educated counterparts. It is known that the level of education can affect fertility preferences because of the alteration of the priorities and the life goals of a person.

Through education, citizens and especially women are empowered with information and knowledge where family planning and reproductive health are concerned. Bongaarts (2010) believes that informed people possess more information regarding the use of contraceptives and reproductive rights, giving them the freedom to decide whether they would like to be fertile or not. In Kenya, where the availability of healthcare information and services to family planning varies across regions, education may play a very important role in shaping the attitude of individuals on contraception and size of the family they desire.

2.2 Empirical Review

Education is an important factor in social and economic progress at both personal and country levels (Patrinos, 2023). Earlier researchers have attributed the advancement of the world to changing trends in Education. There has been a pioneering theoretical correlation between education and development by theorists. Particularly, the fertility transition theory preconditions that in societies undergoing economic development and modernization, levels of fertility decline. Education also plays an important role in this transition because it mobilizes individuals, particularly women, by providing them with access to information, health care, and economic empowerment. Empirical evidence emphasizes that education provides women with skills and knowledge that support informed choice-making regarding family size.

Higher levels of education are generally correlated with increased economic security and increased freedom to postpone childbearing and have fewer offspring. Education has the propensity of offering exposure to appropriate sexual education and availability of modern contraceptives and whereby women are in charge of their reproductive life. This result is confirmed by more recent researchers, including McCarthy and Grodsky (2021), who demonstrate that a more educated woman will tend to have a conception of effective contraception methods and hence prefer smaller families. On numerous occasions, it has been determined that the education of women has been put in place to serve as a significant predictor of Kenyan fertility behavior.

Following the examination of the 1993 data collected by KDHS, Feyisetan and Bankole (2002) found that, educated women were more likely to delay marriage, use contraception and bear fewer children than their less educated counterparts. The increased levels of female education can be credited with the increased social trends of gender equity, economic growth, and health improvement. An example is the World Bank (2020) report that stated that the higher the educational levels of women are, the lower the fertility and the more sustainable the economic growth of a country. The macro-level confirms this, as well as the micro-level ones like Bongaarts (2010), which established the fact that the individual level of education reduces fertility rates; therefore, it makes the demographic transition to a smaller family size and decreased population growth easier. Empirical studies of the connection between the number of children that women prefer and the socioeconomic conditions of African countries determine the presence of strong regional and situational differences.

In recent years, empirical studies have emphasized the understanding of the influence of economic status, education, health care access, and cultural beliefs on the fertility choice of women. Female education and economic development are closely related and positively correlated with low fertility, as Canning et al. (2015) support. They propose their research based on evidence of many African countries that, with increasing education and employability of women, they prefer fewer children because the opportunity costs of having and raising children increase. Economic factors, such as family income and work availability, have a major impact on the fertility preference of women.

According to a study by Odusola et al. (2017), women in wealthier families or those with stable jobs will choose to have small families. This is highly evident in the towns where child-rearing and living expenses are more. The same research also concluded that women with better economic autonomy will be focused on professional life and self-development and they will want to have a small number of children. Alternatively, extended families are desirable in the

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countryside where farming is the main source of livelihood, as they are required to work, thus the higher desired fertility. Africa is a strong example of how education can determine the number of children women want.

Bongaarts et al. (2017) found that the more educated a woman is, the fewer children they have. This is blamed on various reasons such as increased awareness and contraceptive usage, increased career opportunities and their understanding of the economic and health consequences of large families. As an example, one of the studies conducted in Ethiopia by Worku et al. (2016) reported that female respondents with secondary or higher education were far more likely to want small families than that of uneducated ones. It is reinforced by the policies of countries promoting the education of girls, which, by the way, reduces the level of fertility. The availability of healthcare and cultural beliefs is also important in influencing the fertility choices of women.

Much of Africa, especially in rural areas, remains dominated by traditional cultural values that value large family sizes. Nevertheless, according to Cleland et al. (2018), there is a gradual change of such values, especially among young and urban women who are gradually becoming exposed to modern values and lifestyle requirements. Second, healthcare access, especially reproductive health care, has a great impact on fertility-related choices. The study of Ezeh et al. (2017) established itself in the investigation that has proven to be fruitful in countries such as Kenya and Nigeria, whose access to family planning has resulted in a significant reduction in the size of the desired family. Women are able to have better chances to decide on their fertility using modern contraceptives, and reproductive health education enables women to make informed choices regarding their fertility, taking into account their socioeconomic status. Gender differences in education in Kenya are not yet eliminated, and they influence fertility behavior considerably.

III. METHODOLOGY

The cross-sectional research design was employed because it allows for the gathering of information at a single point in time to study a specific phenomenon (Spector, 2019). The study used the KDHS dataset, which was conducted in 2022, encompassing both urban and rural communities in all 47 counties in Kenya. This study only used data collected from women only. A nationally representative sample of 32,156 women aged 15–49 in 42,022 households was interviewed. The age bracket of 15-49 was considered the reproductive age for women. Family planning choices were also included to be controlled.

Questionnaires were used as the main data collection instrument. The pretest included classroom training and field practice for interviewers and biomarker technicians. The questionnaire that was used in the 2022 KDHS was validated using a rigorous methodology that involved pre-tests, expert review, and field tests. The questionnaire was well structured by relying on the existing DHS templates that have, with time, been tested and validated in many countries. Data was analyzed at univariate, bivariate, and multivariate levels. Univariate analysis involved basic descriptives for the study variables, bivariate analysis involved use of pair-wise correlation, while multivariate analysis involved the use of multiple linear regression to test the hypothesis.

IV. FINDINGS & DISCUSSION

4.1 Univariate Statistics

Univariate analysis provided an overview of the distribution of key variables. The mean number of children ever born (v201) was 2.41 ($\sigma = 2.36$), indicating moderate fertility levels. Educational attainment (v133) averaged 8.70 years ($\sigma = 4.35$), reflecting a range from no education to higher education. The mean age of respondents (v012) was 29.14 years ($\sigma = 9.55$). Table 1 summarizes these statistics.

Table 1

Univariate Statistics for Variables in the Analysis

Variable	**Variable Label**	**Obs**	**x̄**	**σ**	**Min**	**Max**
v201	total children ever born	32 156	2,41	2,36	0	15
v133	education in single years	32 156	8,70	4,35	0	24
v012	respondent's current age	32 156	29,14	9,55	15	49
Variable	**Nominal-scale Variable**	**Freq.**	**%**	**Cum.%**		
v190	wealth index combined					
	1=poorest	7 073	22	22		
	2=poorer	5 742	17,86	39,85		
	3=middle	6 345	19,73	59,58		
	4=richer	7 160	22,27	81,85		
	5=richest	5 836	18,15	100		
v312a	status of contraceptive use					
	1=no contraception	18 694	58	58,14		

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	2=traditional contraception methods	1 620	5	63,17		
	3=modern contraception methods	11 842	37	100		
v025a	place of residence					
	0=urban	12 386	39	38,52		
	1=rural	19 770	61	100		
v714	respondent currently working					
	0=currently not working	16 681	51,88	51,88		
	1=currently working	15 475	48,12	100		
v502	1=never in union	10 048	31,25	31,25		
	2=currently in union/living with a man	18 312	56,95	88,2		
	3=formerly in union/living with a man	3 796	11,8	100		
Note. Obs=Observation; Min=Minimum; Max=Maximum; Freq.=Frequency; Cum=Cumulative						

4.2 Bivariate Statistics

Bivariate analysis assessed correlations between the preferred number of children and independent variables. Educational attainment was negatively correlated with the preferred number of children (r = -0.438, $p < .001$), suggesting that higher education is associated with fewer preferred children. Age showed a strong positive correlation (r = 0.701, $p < .001$), while wealth index, contraceptive use, residence, working status, and marital status were also significantly correlated with v201 ($p < .05$), except for the number of sexual partners. Table 2 presents the correlation matrix. Note. Pair-wise correlation: ≤0.35 = Weak correlation; 0.36-0.67 = Moderate correlation; 0.68-0.89=Strong correlation; ≥0.90 = Very strong correlation; Adapted from "Interpretation of Correlation Coefficient, " by R. Taylor, 1990, *Journal of Diagnostic Medical Sonography, 6*(1), p. 37.

Table 2

Pair-Wise Correlation Matrix: Total Children Ever Born, Education Attainment in Single Years, and Control Variables

Variable	**Variable**		**v201**	**v133**	**v012**	**v190**	**v766b**	**v312a**	**v025a**
v201	total children ever born		1						
v133	education in single years	[a]	-0,438	1					
		[b]	<.001						
v012	respondent's current age	[a]	0,701	-0,125	1				
		[b]	<.001	<.001					
v190	wealth index combined	[a]	-0,261	0,542	0,036	1			
		[b]	<.001	<.001	<.001				
v766b	number of sex partners, including spouse, in the last 12 months	[a]	0,010	0,008	0,030	0,029	1		
		[b]	0,182	0,320	0,000	0,000			
v312a	status of contraceptive use	[a]	0,162	0,180	0,207	0,129	0,061	1	
		[b]	<.001	<.001	<.001	<.001	<.001		
v025a	type of place of residence	[a]	0,160	-0,231	0,018	-0,625	-0,021	-0,014	1
		[b]	<.001	<.001	0,001	<.001	0,007	0,015	
v714	respondent currently working	[a]	0,174	0,202	0,391	0,211	0,051	0,271	-0,080
		[b]	<.001	<.001	<.001	<.001	<.001	<.001	<.001
v502a	currently/ formerly/ never in union	[a]	0,502	-0,180	0,569	-0,039	0,035	0,227	-0,003
		[b]	<.001	<.001	<.001	<.001	<.001	<.001	0,619

[a] Pearson correlation coefficient; [b] *p*-values (α=.05)

4.3 Multivariate Statistics

Two multiple linear regression models were estimated to determine the impact of educational attainment on the preferred number of children. Table 3 shows the findings of a multiple linear regression analysis of the impact of educational attainment (v133) on the total number of children ever born (v201) among 32,156 women aged 15-49 years, two models, in which Model 1 includes only the education variable, and Model 2 is used to include other control factors, including age (v012), wealth index (v190), contraceptive use (v312a), place of residence (v025a), employment status (

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In the first model, education is found to negatively influence several children born (coefficient = -0.237, p <.001, β = -0.44). In other words, every additional year of education lowers the number of children born by about 0.237.

In Model 2, this effect weakens but remains significant (coefficient = -0.15, p < .001, β = -0.2679), with age (β = 0.5667) and being currently in union (β = 0.2145) showing strong positive associations with total number of children ever born. The wealth index reveals a decreasing trend in fertility as wealth increases, with the richest quintile having the largest negative effect (coefficient = -0.8265, p < .001). Model 1 has an R^2 of 0.1917, explaining 19.17% of the variance in total number of children ever born, and the root mean squared error (RMSE) of 2.13 suggests a moderate fit. Model 2 has an R2 of 0.6624, explaining 66.24% of the variance in the total number of children ever born, and the RMSE of 1.73 suggests a moderate fit, as shown in Table 3. Note. Coef=Coefficient; RMSE=Standard deviation of the regression model (the closer to zero, the better the fit); Std.Err.=Standard Error; ref=reference.

Table 3

Multiple Linear Regression Coefficients of the Effect of Education Attainment on Total Number of Children Ever Born

		Model 1 (v201)				**Model 2 (v201)**			
Variable	Variable label	Coef	Std.Err.	*p*	β	Coef	Std.Err.	*p*	β
v133	education in single years	-0,237	0,00	<.001	-0,44	-0,15	0,00	<.001	-0,2679
v012	respondent's current age					0,14	0,00	<.001	0,5667
v190	wealth index combined								
	1=poorest (ref.)								
	2=poorer					-0,22	0,03	<.001	-0,0354
	3=middle					-0,44	0,03	<.001	-0,0748
	4=richer					-0,69	0,03	<.001	-0,122
	5=richest					-0,83	0,03	<.001	-0,1348
v312a	status of contraceptive use								
	1=no contraception (ref.)								
	2=traditional contraception					0,14	0,04	<.001	0,0132
	3=modern contraception					0,25	0,02	<.001	0,052
v025a	place of residence								
	0=urban (ref.)								
	1=rural					-0,01	0,02	0,667	-0,0018
v714	respondent currently working								
	0=not working(ref.)								
	1=currently working					-0,10	0,02	<.001	-0,0218
v502a	currently/ formerly/ never in union								
	1=never in union (ref.)								
	2=currently in union with a man					1,02	0,02	<.001	0,2145
	3=formerly in union with a man					0,47	0,03	<.001	0,0637
Constant		4,48	0,03	<.001		-0,67	0,04	<.001	
Model Statistics									
n		32156				32156			
Prob > F		<.001				<.001			
R^2		0,1917				0,6624			
Root Mean Squared Error (RMSE)		2,13				1,73			

4.4 Postestimation Diagnostic Tests

Model diagnostics for the multiple linear regression were conducted.

4.4.1 Normality Test

The assumptions underlying the linear regression are that the errors should be normally distributed. Technically, normality is necessary only for hypothesis tests to be valid. Estimation of the coefficients only requires that the errors be identically and independently distributed. Another assumption of the regression model is that residuals behave normally. Residuals are the difference between the observed values (Yhat) and the predicted values (X). In practice, normality does not represent much of a problem when dealing with really big samples. Figure 1 shows the kernel density estimate graph that helps check for normality in the residuals.

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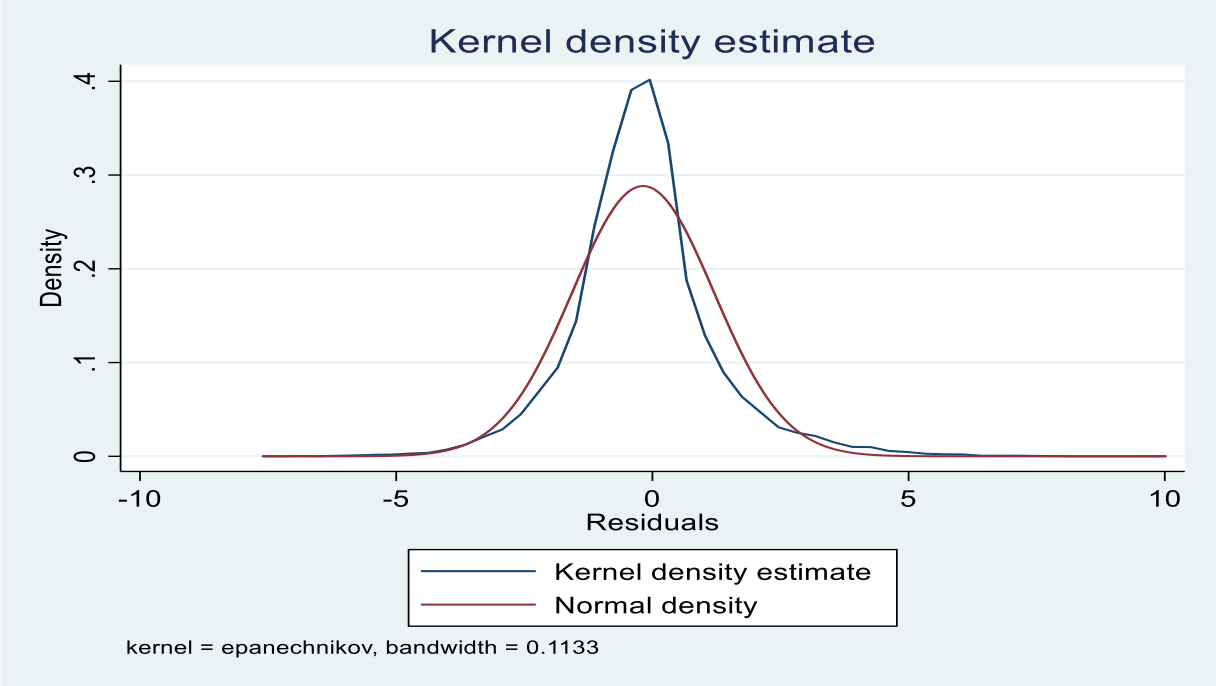

Figure 1
Kernel density estimate for normality test

The residuals appear to follow a normal pattern, suggesting that the model is fine.

4.4.2 Testing for Linearity

The relationships between the predictors and the outcome variable should be linear. For an assessment of the model, a scatter plot was run, and Figure 2.

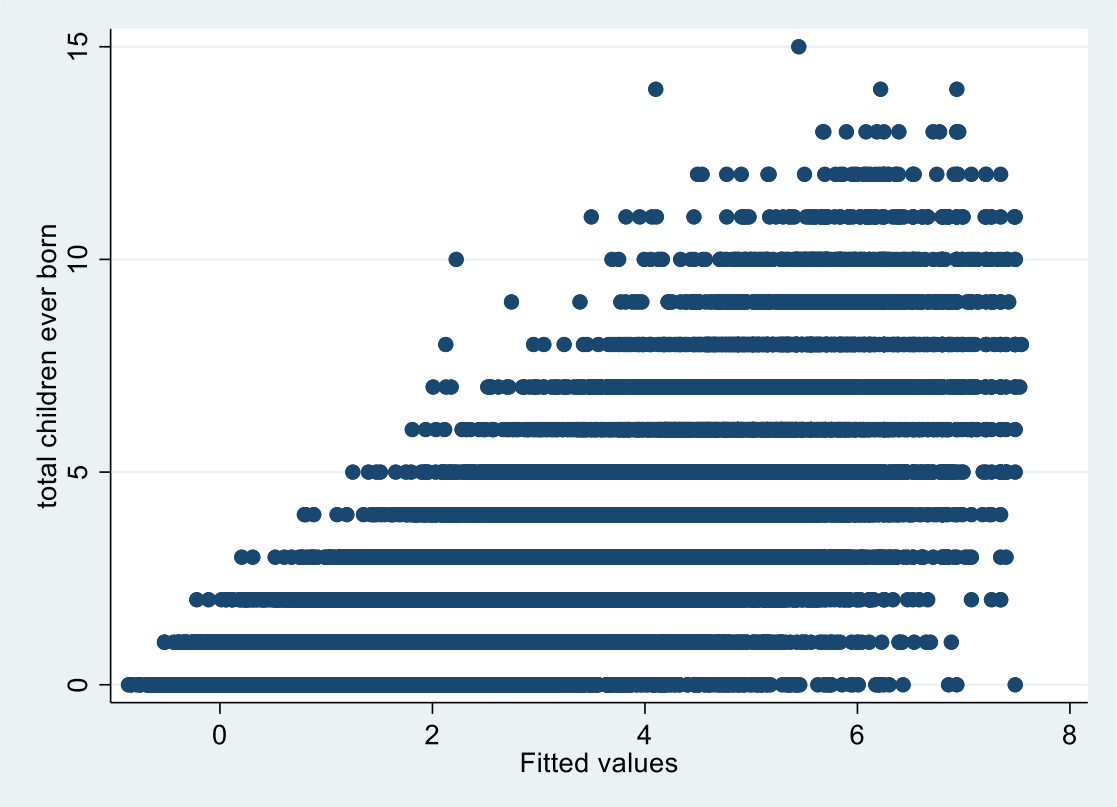

Figure 2
A Scatter Plot

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A 45-degree pattern is expected in the data. The y-axis is the observed data, and the x-axis is the predicted data (Yhat). In this case, the model appears to be fine.

4.5 Test of Hypothesis

The null hypothesis was that the educational attainment of women does not have a significant effect on the preferred children among women in Kenya. The output of Model 2 ($p < .001$) showed that the effect of education on preferred children was significant and negative, and the null hypothesis was therefore rejected.

Table 3

Test of Hypothesis

Testing for the effect of v133 on v201	
(1)	v133 = 0
	F(1, 32143) = 3184.32
	Prob > F = <.001

4.6 Discussion

The results show that increased education levels greatly lower the preferred number of children among women in Kenya, as it is also the case in the literature. Wekesah et al. (2019) found that educated women in Kenya tend to have smaller families due to economic reasons and the availability of reproductive health services. These findings are in line with the negative impact of education ($\beta = -0.264$), where the annual increase in education decreases fertility preferences by an average of 0.143 children.

The positive influence of age is significant (r 0.574), which is caused by cultural and biological factors because older women might have more fertility preferences because they have an established family or have a social pressure to give birth (Muganda, 2021). Consumer behavior based on wealth index revealed that wealthier households have fewer children, which is in line with Gietel-Basten et al. (2022), who indicated that rich women in sub-Saharan Africa usually embrace the low fertility norms because of the lifestyle and economic constraints.

The use of contraceptives, especially implants and injections, was connected with increased preferred children, which is possibly because of the successful family planning that enables women to plan bigger families (Pkaremba, 2024). The unimportance of residence ($p = 0.775$) can be compared with other researchers (Kibet & Mutai, 2018), who reported that rural women choose bigger families because they have to work in agriculture, indicating that circumstances vary in Kenya.

The wealth index reveals a decreasing trend in fertility as wealth increases, with the richest quintile having the largest negative effect (coefficient = -0.8265, $p < .001$). These results are inconsistent to the findings by Odusola et al. (2017), who found that women in wealthier families or those with stable jobs will choose to have small families. This is highly evident in the towns where child-rearing and living expenses are higher. The same researchers also concluded that women with better economic autonomy will be focused on professional life and self-development, and they will want to have a small number of children.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The researchers established a strong negative correlation between educational level and desired number of children among Kenyan women between the age of 15 and 49. The research establishes that the educational attainment has a strong influence on fertility preference of women in Kenya. The more the education, the fewer the children are preferred. Age, wealth, contraceptive use, residence, and marital status are some of the factors which mediate these effects, though education has been found to be an important determinant in all the results. The results imply that education gives women knowledge, autonomy and access to reproductive health resources that allow them to make informed choices on fertility.

5.2 Recommendations

An increased population implies that there are more people to feed. The outcomes have demonstrated that education makes the number of children go down. Thus, it is advisable that families put more money into education. Family planning consumes so much money, yet education appears to be a better alternative; therefore, it is recommended that more resources should be invested in education.

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REFERENCES

Bankole, A., & Malarcher, S. (2010). Removing barriers to adolescents' access to contraceptive information and services. *Studies in Family Planning, 41*(2), 117–124.

Becker, G. S. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago Press.

Berrington, A., & Pattaro, S. (2014). Educational differences in fertility desires, intentions, and behaviour: A life course perspective. *Advances in Life Course Research, 21*, 10–27.

Bongaarts, J. (2010). The causes of educational differences in fertility in Sub-Saharan Africa. *Population Council Working Papers, 5*(2), 1–23.

Bongaarts, J., Cleland, J., Townsend, J. W., Bertrand, J. T., & Gupta, M. D. (2017). *Family planning programs for the 21st century: Rationale and design*. Population Council.

Canning, D., Raja, S., & Yazbeck, A. S. (2015). *Africa's demographic transition: Dividend or disaster?* World Bank Publications.

Cleland, J., Harbison, S., & Shah, I. H. (2018). Unmet need for contraception: Issues and challenges. *Studies in Family Planning, 45*(2), 105–122.

Department of Statistics, Jordan. (2024). *Jordan population and family health survey 2023 (Final report)*. https://dhsprogram.com/pubs/pdf/FR388/FR388.pdf

Ezeh, A. C., Bongaarts, J., & Mberu, B. U. (2012). Global population trends and policy options. *The Lancet, 380*(9837), 142–148.

Feyisetan, B. J., & Bankole, A. (2002). Education and fertility in sub-Saharan Africa: Individual and community effects. *Demography, 39*(2), 233–250.

Gietel-Basten, S., Rotkirch, A., & Sobotka, T. (2022). Changing the perspective on low birth rates: Why simplistic solutions won't work. *BMJ, 379*, e072670. https://doi.org/10.1136/bmj-2022-072670

Johannes, E. (2010). Women's education in Sub-Saharan Africa: Obstacles facing women and girls' access to education: The case of Kenya. *Kenya Studies Review, 1*(2), 57–71.

Kenya National Bureau of Statistics (KNBS), Ministry of Health (MOH), National AIDS Control Council (NACC), Kenya Medical Research Institute (KEMRI), National Council for Population and Development (NCPD), & ICF. (2023). *Kenya demographic and health survey 2022*. https://dhsprogram.com/pubs/pdf/FR383/FR383.pdf

Kenya National Bureau of Statistics. (2019). *2019 Kenya population and housing census: Volume I – Population by county and sub-county*. Kenya National Bureau of Statistics.

Kibet, L., & Mutai, R. (2018). Rural-urban differences in fertility preferences in Kenya. *African Journal of Reproductive Health, 22*(4), 45–53.

Lari, N., Awadalla, A., Al-Ansari, M., & Elmaghraby, E. (2022). Determinants of female labor force participation: Implications for policy in Qatar. *Cogent Social Sciences, 8*(1), 2130223.

McCarthy, J., & Grodsky, E. (2021). Women's education and fertility: Evidence from 26 Sub-Saharan African countries. *Journal of Population Economics, 34*(1), 225–250.

Ministry of Development Planning and Statistics. (2020). *Qatar social statistics*.

Moultrie, T. A., & Timaeus, I. M. (2003). Fertility and living arrangements in South Africa. *Journal of Southern African Studies, 29*(1), 143–158.

Muganda, J. (2021). Education and fertility in sub-Saharan Africa: A meta-analysis of DHS data. *Studies in Family Planning, 52*(2), 127–141. https://doi.org/10.1111/sifp.12153

Odusola, A. F., Cornia, G. A., Bhorat, H., & Conceição, P. (2017). *Income inequality trends in sub-Saharan Africa: Divergence, determinants, and consequences.* United Nations Development Programme.

Opiyo, C. O., & Levin, M. J. (2008). Fertility levels, trends, and differentials in Kenya: How does the own-children method add to our knowledge of the transition? *African Population Studies, 23*(2), 189–205.

Patrinos, H. A. (2023, February 2). Why education matters for economic development. *World Bank Blogs*. https://blogs.worldbank.org/en/education/why-education-matters-economic-development

Pkaremba, L. C. (2024). *Analysis of contraceptive use, discontinuation and switching among homeless women in Kenya: A case of Nairobi County* (Doctoral dissertation, University of Nairobi).

South Africa Department of Health, Statistics South Africa, South African Medical Research Council, & ICF. (2019). *South Africa demographic and health survey 2016*. https://dhsprogram.com/pubs/pdf/FR337/FR337.pdf

Spector, P. E. (2019). Do not cross me: Optimizing the use of cross-sectional designs. *Journal of Business and Psychology, 34*(2), 125–137.

Uddin, G. A. (2016). *Population changes and implications for economic growth and the environment in Australia* (Doctoral dissertation, University of Southern Queensland).

Ushe, M. U. (2011). Role of traditional African moral values in the development of Nigeria. *Journal of Sociology, Psychology and Anthropology in Practice, 3*(2), 1–13.

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Wekesah, F. M., Nyanjau, L., & Kibachio, J. (2018). Individual and household-level factors associated with presence of multiple non-communicable disease risk factors in Kenyan adults. *BMC Public Health, 18*(Suppl 3), 1220. https://doi.org/10.1186/s12889-018-6055-8

Worku, A., Tessema, G. A., & Zeleke, A. A. (2016). Trends and determinants of contraceptive use among young married women (age 15–24) based on the 2000, 2005, and 2011 Ethiopian Demographic and Health Surveys: A multivariate decomposition analysis. *PLOS ONE, 10*(12), e0142550.

World Bank. (2020). *World development report 2020: The role of education in economic development*. World Bank.

Zhang, J. (2017). The evolution of China's one-child policy and its effects. *Journal of Economic Perspectives, 31*(1), 141–160. https://doi.org/10.1257/jep.31.1.141

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Comparison of handcrafted features extraction techniques for traffic sign recognition

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ABSTRACT

Traffic Sign Recognition (TSR) is a critical computer vision task for the advancement of Autonomous Driver Assistance Systems (ADAS) and autonomous vehicles, directly impacting road safety. While deep learning dominates current research, handcrafted feature extraction techniques remain relevant due to their interpretability, lower computational demands, and suitability for embedded systems. This paper presents a systematic empirical evaluation and comparison of five predominant handcrafted feature extraction methods: Histogram of Oriented Gradients (HOG), Scale-Invariant Feature Transform (SIFT), Bag of Words (BoW), Local Binary Patterns (LBP), and Gabor Filters for traffic sign recognition. The techniques are assessed on the German Traffic Sign Recognition Benchmark (GTSRB) using three classifiers: Support Vector Machine (SVM), Random Forest, and Decision Tree. Experimental results demonstrate that the choice of feature extractor and classifier significantly impacts performance, with HOG combined with an SVM classifier achieving the highest accuracy (95.2%). The study provides a clear performance hierarchy, revealing that HOG and LBP offer the best balance of accuracy and computational efficiency for this domain. We conclude that the optimal selection of a handcrafted feature extraction strategy is problem-dependent and provide concrete recommendations for implementing effective and efficient TSR systems.

Keywords: Bag of Visual Words (BoW), Computer Vision, Feature Extraction, Gabor Filters, Handcrafted Features, Histogram of Oriented Gradients (HOG), Local Binary Patterns (LBP), Machine Learning, Scale-Invariant Feature Transform (SIFT), Traffic Sign Recognition (TSR)

I. INTRODUCTION

Traffic sign recognition (TSR) research is attracting enormous attention and is considered an important element of Automatic Driver Assistant System (ADAS) and autonomous vehicles (Saadna & Behloul, 2017). Autonomous vehicle's ability to promptly and accurately detect and recognize a traffic sign is considered as a matter of human life (Almaskati et al., 2023). Traffic signs convey crucial information that could be missed out by drivers due to many factors including distractions and tiredness. Drivers driving in unfamiliar places may pay less attention to traffic signs; making automatic detection and recognition of traffic signs an important aspect towards improving road safety. Traffic Sign Recognition is the process of automatically detecting, localizing and recognizing (classifying) a traffic sign. It involves accurately detection of a traffic sign amidst dynamic status of the road and correctly recognizing the traffic sign, within a reasonable time. This requires TSR systems to not only be accurate but also fast because it can be catastrophic for TSR system to correctly recognize a traffic sign after the vehicle has already significantly passed the sign. TSR can be done in two different ways; using machine learning and deep learning.

The importance of traffic sign recognition (TSR) in improving road safety and enabling autonomous driving technologies has made it one of the most studied topics in computer vision. Two concurrent trends have dominated the conversation globally: the continuous relevance of handmade feature extraction techniques and the emergence of deep learning algorithms, which today achieve state-of-the-art performance on benchmarks like GTSRB. According to Maletzky et al. (2023), deep learning-based techniques, specifically Convolutional Neural Networks (CNNs), have shown accuracies of over 98% on the GTSRB dataset. However, these techniques are very resource-dependent, requiring high energy consumption, strong GPUs, and huge datasets, which restricts their use on low-power or embedded devices (Omid-Zohoor et al., 2018). Because they are interpretable, computationally lighter, and more flexible in limited settings, handcrafted features like Histogram of Oriented Gradients (HOG), Scale-Invariant Feature Transform (SIFT), Bag of Words (BoW), Local Binary Patterns (LBP), and Gabor filters have seen a resurgence in popularity due to this conflict between accuracy and computational efficiency.

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Compared to Europe, the US, and Asia, where there are several benchmarks and industrial deployments, TSR research is still comparatively underdeveloped at the regional level (Africa) (Ellahyani & El Ansari, 2021). Variable lighting and weather conditions, faded or damaged signs, non-standardized signage, and inadequate traffic infrastructure upkeep are some of the particular difficulties that African environments provide that have a direct impact on recognition accuracy. These circumstances highlight how crucial it is to have reliable feature extraction methods that perform effectively in less-than-ideal circumstances. Furthermore, there has been little development of localized datasets that capture the actual heterogeneity of African roads; instead, the majority of TSR studies in Africa have depended on imported datasets like GTSRB. Because of this disparity, it is challenging to determine if current feature extraction techniques can be directly used or require modification.

Road safety continues to be a significant economic and public health concern in Kenya. According to Kiran et al. (2009), human error, a lack of compliance with traffic regulations, and inadequate road infrastructure are the main causes of Kenya's high traffic accident rates, which rank among the highest in Sub-Saharan Africa. Thus, trustworthy TSR systems may help both human drivers and semi-autonomous systems, thereby lowering the number of accidents. However, there hasn't been much study on TSR in Kenya, and the majority of computer vision applications concentrate on medical imaging, facial recognition, and agriculture rather than intelligent transportation. The absence of empirical assessments of handcrafted feature extraction techniques in Kenyan road settings, where signs are frequently obscured by dust, vegetation, or commercial signage, is a significant gap. The paper discusses how machine learning techniques can be applied to images with the aim of extracting handcrafted features.

1.1 Statement of the Problem

The necessity for dependable Traffic Sign Recognition (TSR) systems has increased due to the quick development of autonomous cars and Advanced Driver-Assistance Systems (ADAS), as a malfunction could have catastrophic safety repercussions. Because of their interpretability, reduced processing requirements, and efficiency in resource constrained embedded systems, handcrafted feature extraction techniques continue to be very relevant even if deep learning approaches now dominate contemporary research (Almaskati et al., 2023). Nevertheless, there is a notable lack of useful advice for academics and developers on how to choose suitable handcrafted features. For the particular problem of traffic sign recognition, there is a lack of comparative documentation regarding the computational tradeoffs and performance of well-known methods such as HOG, SIFT, LBP, BoW, and Gabor filters. Without a clear, empirical analysis of these methods on a standardized benchmark, developers face challenges in selecting the optimal feature extraction strategy that balances accuracy, speed, and implementation complexity for their specific application requirements. This study addresses this gap by systematically evaluating and comparing these five handcrafted feature extraction techniques to provide a definitive performance hierarchy and practical recommendations.

1.2 Research Objective

To conduct a comprehensive empirical evaluation and comparison of five handcrafted feature extraction techniques for traffic sign recognition.

II. LITERATURE REVIEW

2.1 Theoretical Review

Domain knowledge is used to extracted features from images for handcrafted methods (Wali, 2015), (Fu & Huang, 2010), (Kiran et al., 2009). Handcrafted features that can be extracted from traffic sign images are shape, color, texture and spatial feature. This section discusses the four features in details.

2.1.1 Shape Features

These features capture the shape of the traffic sign, such as the number of corners (Maletzky et al., 2023), the length of the sides, and the area of the sign. The number of corners in a traffic sign can be a useful feature for classification. For example, stop signs typically have four corners, while yield signs typically have three corners. The length of the sides of a traffic sign can also be a useful feature for classification. For example, speed limit signs typically have longer sides than warning signs. When it comes to area, the area of a traffic sign can also be a useful feature for classification. For example, larger signs are typically more important than smaller signs. The circularity of a traffic sign is the ratio of the area of the sign to the area of a circle with the same perimeter. Circular signs, such as stop signs, tend to have a higher circularity than non-circular signs. The compactness of a traffic sign is the ratio of the area of the sign to the square of the perimeter. Compact signs, such as yield signs, tend to have a higher compactness than non-compact signs. The convexity of a traffic sign is a measure of how smooth the edges of the sign are. Convex signs, such as stop signs, tend to have a higher convexity than non-convex signs. Finally, the symmetry of a traffic sign is a measure of how evenly the sign is divided into two halves. Symmetric signs, such as stop signs, tend to have a higher symmetry

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than non-symmetric signs (Maletzky et al., 2023). Therefore, shape features have an important role in the classification of traffic signs.

2.1.2 Color Features

Color features are based on the color of the traffic sign. They are one of the most common types of features used for traffic sign recognition. There are many different ways to extract color features from images (Maletzky et al., 2023). Some common features include Red Green Blue (RGB) features that involves extracting the red, green, and blue (RGB) values of each pixel in the image. Hue, Saturation Value (HSV) features is more robust to variations in illumination than RGB features. It involves extracting the Hue, Saturation, and Value (HSV) values of each pixel in the image. Another feature that can be extracted is the YCbCr features. These features are more robust to variations in illumination than HSV features. It involves extracting the luminance (Y), chrominance blue (Cb), and chrominance red (Cr) values of each pixel in the image. Histogram features can also be extracted from an image. These features involve extracting the histogram of the colors in the image. The histogram is a plot of the number of pixels in the image that have each color value. Lastly, color moments involve extracting the moments of the color distribution in the image. The moments are a set of statistical measures that can be used to describe the distribution of the colors in the image tune (Khalid et al., 2014) and (Azhar et al., 2015). Notably, color features can be effective for traffic sign recognition, but they can also be sensitive to variations in illumination and viewpoint. Additionally, they can be difficult to design and implement.

2.1.3 Texture Features

These features capture the texture of the traffic sign, such as the smoothness, roughness, and coarseness of the surface. Texture features are based on the texture of the traffic sign. (Maletzky et al., 2023) and (Khalid et al., 2014) notes that they are a type of features that is less sensitive to variations in illumination and viewpoint than color features. There are many different ways to extract texture features from images. Some common methods include Gabor filters are type of filter that is sensitive to specific frequencies and orientations of texture. They can be used to extract features that are invariant to changes in illumination and viewpoint. Haralick features are a set of statistical measures that can be used to describe the texture of an image. They are often used in combination with other features, such as color features. Finally, Local binary patterns (LBP) texture descriptor that measures the contrast between neighboring pixels. It is a simple yet effective texture descriptor that can be used with a variety of machine learning algorithms. Therefore, texture features can play a major role in TRS.

2.1.4 Spatial Features

These features capture the spatial relationships between different parts of the traffic sign, such as the distance between the edges of the sign (Khalid et al., 2014), or the position of the text in the sign. Spatial features are based on the spatial relationships between the pixels in the image. They are a type of feature that is less sensitive to variations in illumination and viewpoint than color and texture features. Some common methods include Edge features which are based on the edges in the image. Edges are discontinuities in the intensity or color of the image. They can be used to extract features that are invariant to changes in illumination and viewpoint. Corner features are based on the corners in the image. Corners are points where two edges meet. They can be used to extract features that are invariant to changes in illumination and viewpoint. Shape features are based on the shape of the object in the image. They can be used to extract features that are invariant to changes in illumination and viewpoint. Spatial features can be effective for traffic sign recognition, but they can also be difficult to design and tune.

2.2 Empirical Review

Texture, shape, color and spatial hand felt features of an image are the basis of Feature Extraction and Classification (FEC). (Azhar et al., 2015), (Omid-Zohoor et al., 2018), (Jaiswal & Banka, 2017) and (Sugimura et al., 2016) gives examples of different methods that are used for feature extraction in FEC including Histogram of Oriented Gradients (HOG), Scale-Invariant Feature Transform (SIFT), Bag-of-Words (BOW), Local Binary Patterns (LBP) and Gabor filters. According to (Omid-Zohoor et al., 2018) and (Jaiswal & Banka, 2017), the extracted features are arranged and prepared into a format that can be used as an input to a machine learning algorithm such as random forest, logistics regression, K- nearest neighbor, and support vector machine.

Histogram of Oriented Gradients (HOG) algorithm was first introduced by Navneet Dalal and Bill Triggs in 2005 in their paper titled "Histograms of Oriented Gradients for Human Detection" (Jaiswal & Banka, 2017). Since its introduction, the HOG algorithm has been extensively studied and applied in various fields such as pedestrian detection, facial expression recognition, vehicle detection, and texture classification (Jaiswal & Banka, 2017). Notably, in 2005, Dalal and Triggs demonstrated the effectiveness of the HOG algorithm in detecting pedestrians in real-world images. They compared the performance of the HOG algorithm with other feature descriptors such as SIFT and showed that the HOG algorithm outperforms other feature descriptors in terms of accuracy and speed. (Wang & Schmid, 2013) proposed

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a multi-scale HOG algorithm that can handle objects of different sizes. They achieved better performance in detecting small objects by using a finer grid for feature extraction in small scales. (Mikolajczyk & Schmid, 2005), proposed a HOG-based method for detecting salient objects in images. (Mikolajczyk & Schmid, 2005) used the HOG algorithm to extract features and combined them with saliency maps to improve the performance of salient object detection.

Scale-Invariant Feature Transform (SIFT) algorithm was introduced by David Lowe in 1999 in his paper titled "Object recognition from local scale-invariant features" (Omid-Zohoor et al., 2018). SIFT algorithm has been widely studied and applied in various fields such as object recognition, 3D reconstruction, and image retrieval (Sugimura et al., 2016). Mikolajczyk and Schmid (2005) proposed a method for detecting and recognizing objects in images using SIFT key points and an SVM classifier. They achieved good performance in detecting and recognizing objects in cluttered Images. Sadeghi et al (2018) proposed a modified SIFT algorithm that uses local contrast normalization to improve the robustness of SIFT features to illumination changes. They achieved better performance in object recognition under varying lighting conditions. Luus et al (2015) proposed a deep learning-based method for feature extraction that combines the strengths of SIFT and deep convolutional neural networks (CNNs). They achieved state-of-the-art performance in object recognition on several benchmark datasets. SIFT effectiveness and robustness to scale, rotation, and affine distortion have been demonstrated in various applications, and modifications have been proposed to improve its performance.

The Bag-of-Words (BoW) model is a method for image and text classification in computer vision and natural language processing (Park et al., 2014). The BoW model has shown to be effective in various image classification tasks, such as Image recognition, object recognition, and face recognition (Ellahyani & El Ansari, 2021). In particular, the BoW model has been used in conjunction with classifiers such as support vector machines (SVMs) and random forests to achieve state-of-the-art performance in various benchmarks (Park et al., 2014), (Ellahyani & El Ansari, 2021) and (Zhao, 2013). The BoW model has also been applied in text classification tasks, where it represents each document as a bag of its constituent words. In this case, the BoW model creates a dictionary of words by collecting all unique words from the documents in the dataset (Park et al., 2014). Then, it represents each document as a histogram of the frequencies of the words in the document, where the words are the dictionary entries. The BoW model has been used in conjunction with classifiers such as Naive Bayes and SVMs to achieve state-of-the-art performance in various benchmarks. BoW model is a powerful and flexible method for feature extraction and classification in both image and text domains (Zhao, 2013).

Local Binary Patterns (LBP) was first introduced by Ojala et al. in 1996 as a simple yet effective texture descriptor, and since then, it has been extensively studied and applied in various computer vision applications (Kuo & Chiu, 2012). In texture classification, the LBP descriptor has been used in conjunction with classifiers such as SVMs and KNN to achieve good performance on standard texture datasets such as the Brodatz texture dataset (Nanni & Lumini, 2012). In object recognition, the LBP descriptor has been applied in conjunction with other feature descriptors such as SIFT and HOG on standard object recognition datasets such as the PASCAL VOC dataset (Peng et al., 2014). The Extended Local Binary Patterns (ELBP) descriptor (Zhang et al., 2013) extends the LBP operator by considering the circularly symmetric patterns, while the Rotation-Invariant Local Binary Patterns (RI-LBP) descriptor (Zhang et al., 2013) ensures the invariance of the LBP descriptor to rotation by encoding the local texture information using rotation-invariant patterns. LBP descriptor is a simple yet highly effective method for texture analysis and recognition in computer vision.

Gabor filters, named after physicist Dennis Gabor are based on the principle of decomposing an image into its constituent frequencies and orientations, similar to the human visual system (Ojala et al., 1996). Gabor filters have been extensively studied and applied in various computer vision applications one different datasets such as the Caltech 101 and Caltech 256 (Singh, 2016). Gabor filters have also been used in biometric applications such as face recognition and iris recognition, where they have been shown to be effective in capturing the local texture information of the face or iris. The Dual-Tree Complex Wavelet Transform (DT-CWT) (John et al., 2017) extends the Gabor filter by using a wavelet decomposition of the image, while the Log-Gabor filter (John et al., 2017) is a variant of the Gabor filter that is designed to be more efficient in terms of computational complexity. Gabor filter is a powerful tool for image and signal processing in computer vision

III. METHODOLOGY

3.1 Research Design and Approach

The performance of five popular handcrafted feature extraction techniques—Histogram of Oriented Gradients (HOG), Scale-Invariant Feature Transform (SIFT), Bag of Words (BoW), Local Binary Patterns (LBP), and Gabor Filters—in the context of traffic sign recognition (TSR) was systematically assessed and compared in this study using a quantitative experimental research design. The necessity to present actual data on the precision, effectiveness, and trade-offs of different techniques under controlled circumstances served as the driving force for the design.

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The method coupled careful performance evaluation with various classifiers with experimentation on benchmark datasets. The German Traffic Sign Recognition Benchmark (GTSRB), an internationally known standard for TSR research, was chosen because of its complexity, diversity in illumination, occlusion, and picture resolution. It comprises 51,840 annotated traffic sign images in 43 categories.

3.2 The Dataset

The Germany Traffic Sign Detection Benchmark was used to carry out experiments on the five handcraft feature extractors. It has 51,840 traffic sign images that are grouped into 43 classes. These images are made up of different sizes, have varying occlusion and illumination making the dataset perfect for the comparison experiment. 80 percent of the images were used in training of the models and 20 percent for testing the performance of the model.

3.3 Experiment Procedure

The following section discusses how the experiment was carried out with the aim of comparing the five handcraft feature extractors. The experiment was done using python 3, windows 10, sklearn and CV libraries. Visual Studio IDE was used to conduct the experiment. All images were resized to 64 by 64 pixels before the process of feature extraction started. In order to normalize illumination and improve contrast, contrast limited adaptive histogram equalization was applied to the images. This process made features more robust to changes in light. Lastly, segmentation was done on the images with the aim of isolating the sign from the image. The classifier that will be used for training and testing the five handcraft features require a feature vector as a parameter. Therefore, each image was processed and the resulting feature vector was stored in as a set. Three classifiers were used to train and evaluate the feature sets that were extracted in section 3.2.1. These classifiers are Support Vector Machine, Random Forest and Decision Tree. All the three classifiers are part of the sklearn python library. Evaluation was done using accuracy, precision, recall and F1-Score. Validation was done using stratified k-fold with 4 folds and confusion matrix.

3.4 Justification of Design

This study's experimental research strategy is suitable since it allows for the controlled, repeatable testing of various feature extraction methods in consistent settings. Cross-validation and a combination of various classifiers guarantee that the study's conclusions are not skewed toward any one approach. Moreover, the GTSRB dataset offers a globally recognized standard by which the findings can be contrasted with earlier international research and used to guide local applications in Kenya.

IV. FINDINGS & DISCUSSION

4.1 Comparison of Handcrafted Features

Handcrafted features that can be extracted from an image are compared int the literature review and summarized in the table 1 outlining strength and weakness of each of these features.

Table 1

Summaries the Four Features stating the Advantages and Disadvantages

Feature	Strength	Weakness	Author
Color features	Easy to understand and interpret Can be used with a variety of machine learning algorithms Can be robust to variations in illumination to some extent	Can be sensitive to variations in viewpoint May not be able to capture all of the important information in the image	(Fu & Huang, 2010) and (Maletzky et al., 2023)
Texture features	Less sensitive to variations in illumination and viewpoint than color features Can be used to capture more information about the texture of the traffic sign	Can be difficult to design and tune May not be able to capture all of the important information in the image	(Fu & Huang, 2010) and (Kiran et al., 2009)
Spatial features	Less sensitive to variations in illumination and viewpoint than color and texture features Can be used to capture more information about the shape of the traffic sign	Can be difficult to design and tune May not be able to capture all of the important information in the image	(Kiran et al., 2009)
Shape features	Can be more robust to variations in illumination and viewpoint than color and texture features Can be used to capture more information about the shape of the traffic sign	Can be difficult to design and tune May not be able to capture all of the important information in the image	(Fu & Huang, 2010)

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Although color features are easy to use and make use of the sign's color information, they are extremely sensitive to changes in lighting and perspective. Texture characteristics are more resilient to changes in perspective and illumination than color features. They also study surface patterns while spatial features are less impacted by environmental factors and capture interactions between pixels; however, their effectiveness depends on proper design. Shape aspects which emphasize geometric qualities like corners and contours that provide high resilience to visual changes, they also pose serious design difficulties. Even if each feature type has unique benefits for traffic sign identification overall, they are nonetheless limited by the same design complexity and information loss risk.

4.2 Feature Extraction and Classification Techniques

The section compares the feature extraction techniques that can be applied on an image.

Table 2

Summary of feature Extraction and Classification

Technique	Strength	Weakness	Author
Histogram of Oriented Gradients	Effective for capturing shape and texture information in images. Robust to changes in illumination and background clutter.	May struggle with complex background textures and cluttered scenes. Sensitivity to variations in object appearance and viewpoint	(Jaiswal & Banka, 2017) (Wang & Schmid, 2013) and (Mikolajczyk & Schmid, 2005)
Scale-Invariant Feature Transform	Provides distinctive and invariant local features robust to scaling, rotation, and affine transformations. Well-suited for object recognition and image matching tasks.	Computational complexity increases with the number of key points and descriptors. Requires careful parameter tuning for optimal performance.	(Omid-Zohoor et al., 2018) and (Luus et al., 2015)
Bag-of-Words	Efficient representation of image features using visual word histograms. Suitable for classification and retrieval tasks in large-scale image datasets.	Loss of spatial information due to histogram aggregation. Limited ability to capture fine details and geometric information.	(Ellahyani & El Ansari, 2021) (Zhao, 2013) and (Kuo & Chiu, 2012)
Local Binary Patterns	Simple and computationally efficient texture descriptor. Effective for texture classification and segmentation tasks.	Limited discriminative power compared to more complex descriptors. May struggle with complex texture patterns and variations.	(Nanni & Lumini, 2012) (Peng et al., 2014) and (Ojala et al., 1996)
Gabor Filters	Sensitive to texture variations and edges in images. Useful for tasks such as texture analysis, segmentation, and edge detection.	Parameter selection and tuning can be challenging. Computationally intensive, especially for large filter banks and image sizes.	(Banik et al., 2022), (Singh, 2016) and (John et al., 2017)

HOG is highly effective for capturing shape and texture information while demonstrating robustness to illumination changes, though it can struggle with cluttered backgrounds. SIFT provides excellent invariance to scale and rotation transformations, making it ideal for recognition tasks, but at the cost of high computational complexity. Bag-of-Words offers efficient representation for large-scale datasets through histogram aggregation, but sacrifices spatial information and fine details. LBP is computationally simple and effective for texture analysis, though it has limited discriminative power for complex patterns. Gabor Filters are sensitive to texture and edge variations, useful for detailed analysis, but require significant parameter tuning and computational resources. Each method presents a trade-off between descriptive power, computational efficiency, and implementation complexity.

4.3 Experimental Results

The first experiment main aim was to compare the features of the five feature descriptors. A grayscale image was used as an unput to the functions that extracts features. Figure 1 and 2 shows the extracted features for each extractor.

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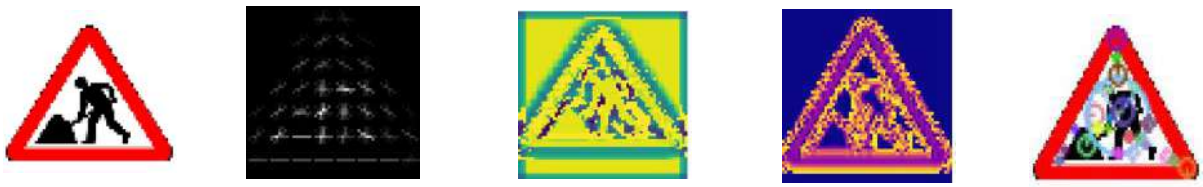

Original Image HOG LBP Gabor filters SIFT

Figure 1
Visualization of Handcrafted Features Extracted from a sample Traffic Sign

From left to right: Preprocessed grayscale input image, HOG feature visualization, LBP texture map, and Gabor filter response magnitude.

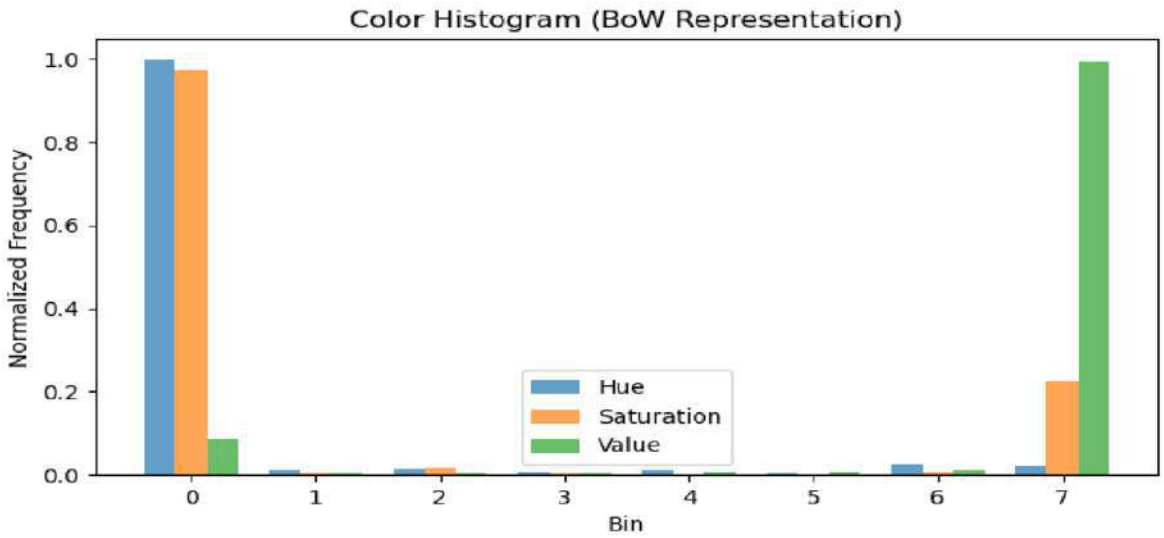

Figure 2
Visualization of Handcrafted Features Extracted from a Sample Traffic sign using Bag of Words

The second experiment was creation and evaluation of the model. Testing results on how the five feature extractors performed when subjected to three classifies are summarized by table 1, 2 and 3 below.

Table 3
Comparison for LBP, LDP, HOG and LD-HOG on GTSDB dataset using SVM

Feature Extractor	Precision	Recall	F1- Score
HOG	96	95	93
SIFT	92	92	95
BoW	93	92	91
LBP	97	89	94
Gabor filter	82	85	83

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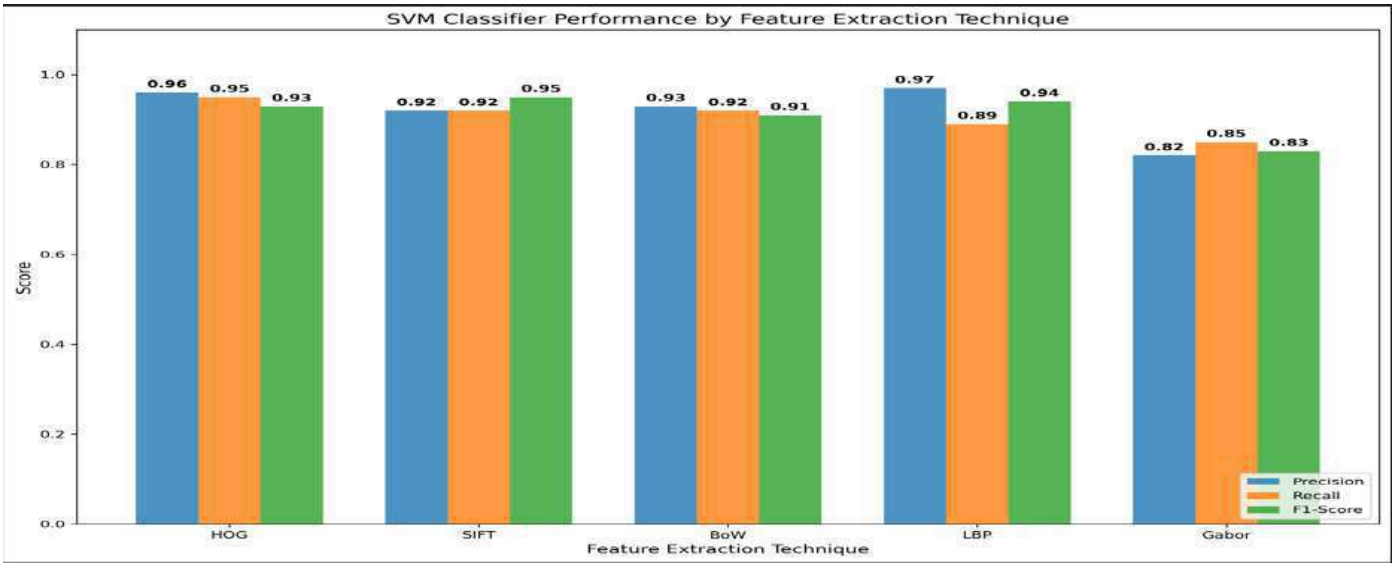

Figure 3
Visualization of Performance of Feature Extractors using SVM

HOG demonstrated strong and balanced performance with high precision and recall, confirming its robustness for capturing the defining shapes of traffic signs. SIFT achieved the highest overall F1-Score while LBP attained the highest precision, indicating minimal false positives, its lower recall suggests a weakness in detecting all true signs. The Bag-of-Words model delivered solid results, reflecting its general-purpose nature, whereas Gabor Filters performed significantly worse than all other methods.

Table 4
Comparison for LBP, LDP, HOG and LD-HOG on GTSDB dataset using Random Forest

Feature Extractor	Precision	Recall	F1- Score
HOG	89	89	89
SIFT	83	90	86
BoW	88	82	86
LBP	90	92	89
Gabor filter	78	80	81

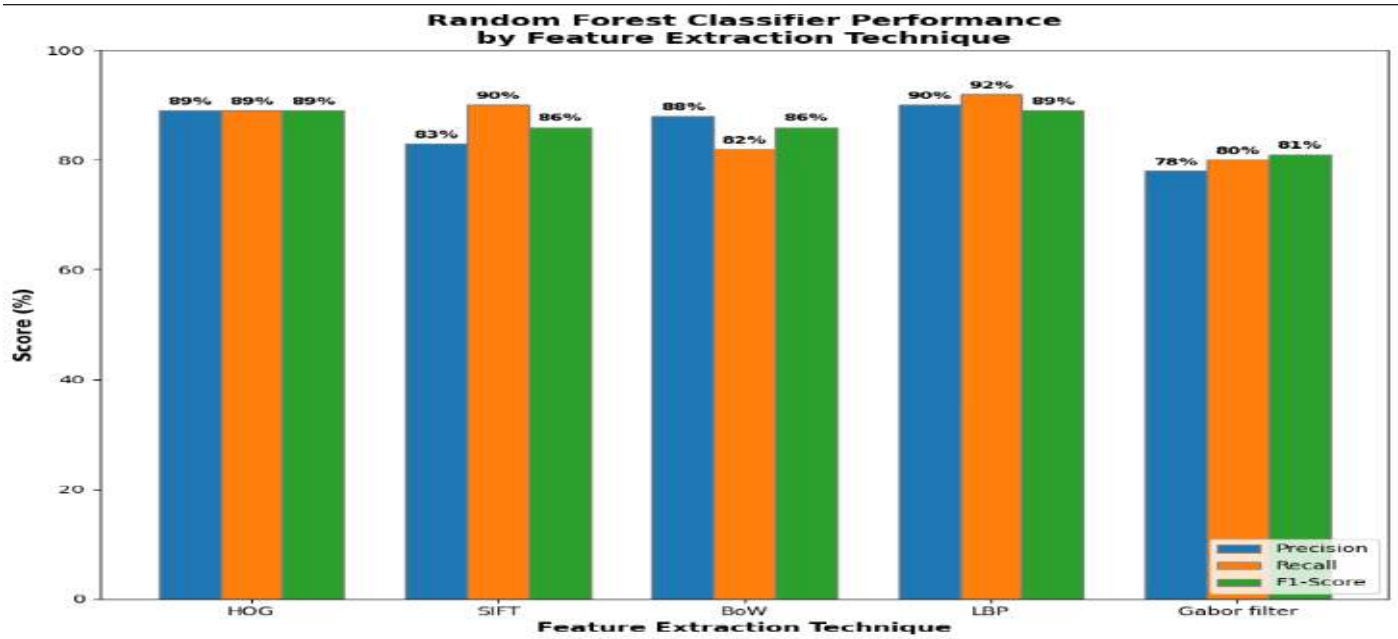

Figure 4
Visualization of Performance of Feature Extractors using Random Forest

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Based on the results, LBP emerges as the top-performing feature extractor for the Random Forest classifier, achieving the highest combined scores with excellent precision (90%) and the best recall (92%), resulting in a strong F1-Score of 89%. HOG also performs robustly, demonstrating perfect balance across all three metrics (89% each), indicating consistent and reliable predictions. SIFT and BoW deliver comparable overall performance (F1: 86%), but with a key difference: SIFT is better at finding all relevant signs (high recall: 90%), while BoW is better at ensuring its predictions are correct (high precision: 88%). Finally, Gabor Filters are the least effective by a significant margin across all metrics (Precision: 78%, Recall: 80%, F1-Score: 81%), confirming they are not well-suited for this task compared to the other methods.

Table 5

Comparison for LBP, LDP, HOG and LD-HOG on GTSDB dataset using Decision Tree

Feature Extractor	Precision	Recall	F1- Score
HOG	76	76	76
SIFT	72	73	76
BoW	70	69	67
LBP	74	72	75
Gabor filter	68	70	69

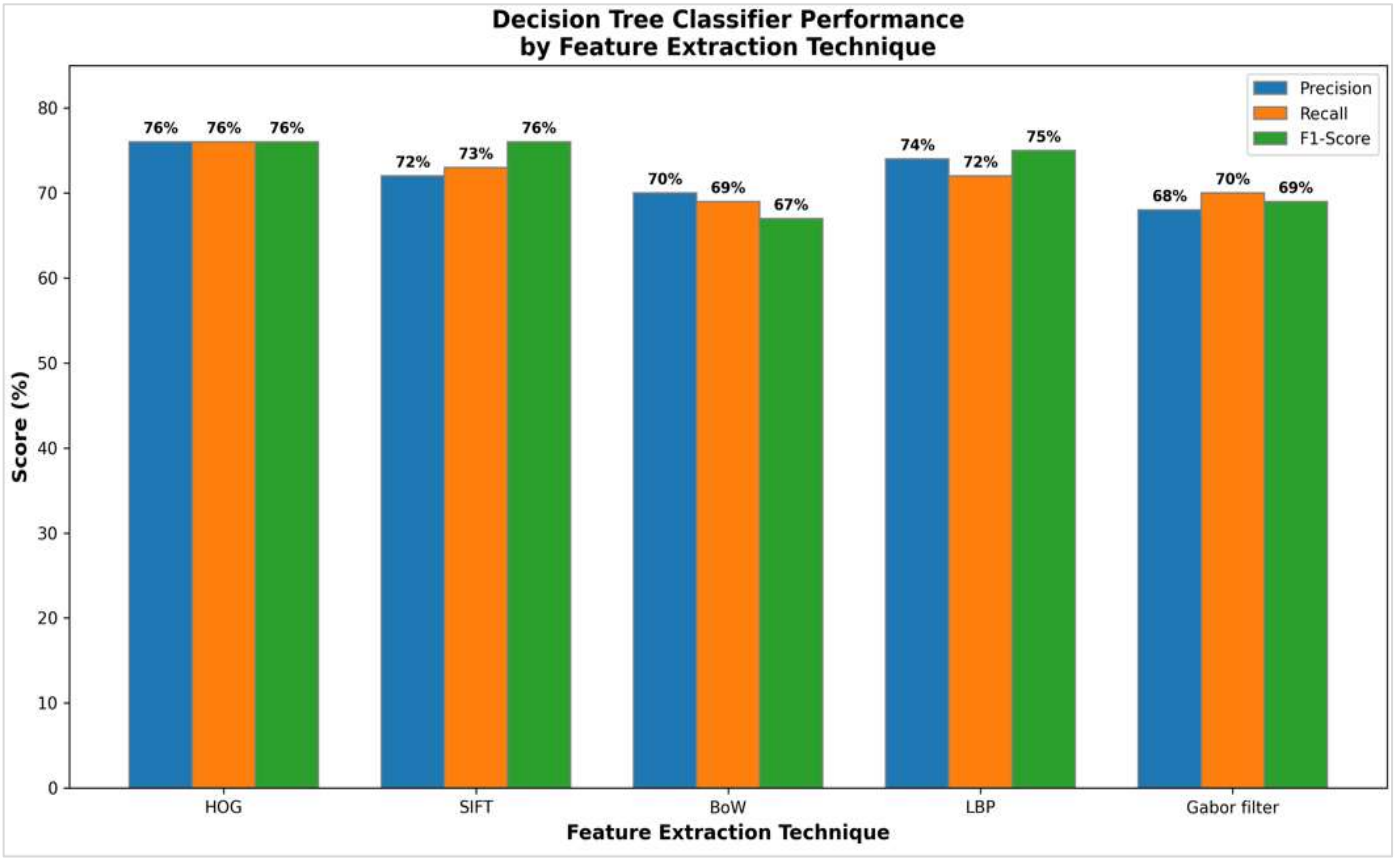

Figure 5

Visualization of Performance of Feature Extractors using Decision Tree

Validation of the evaluation results was done using stratified k fold with 4 folds on the HOG results for the three classifiers. Table 6 summaries these results.

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Table 6
Validation of HOG Results on the Three Classifier.

classifier	Fold 1	Fold 2	Fold 3	Fold 4	Average
SVM	94.9	94.2	95.1	95.9	95.2
RF	88.3	88.3	90.1	89.3	89.0
DT	75.7	76.8	75.8	75.7	76.2

The results suggest that the evaluation criteria were right and accurate because the results were with the acceptable range of variation. This was generalized to the other feature extractors. Confusion matrix as shown by figure 6 further supports the validity of the evaluation results.

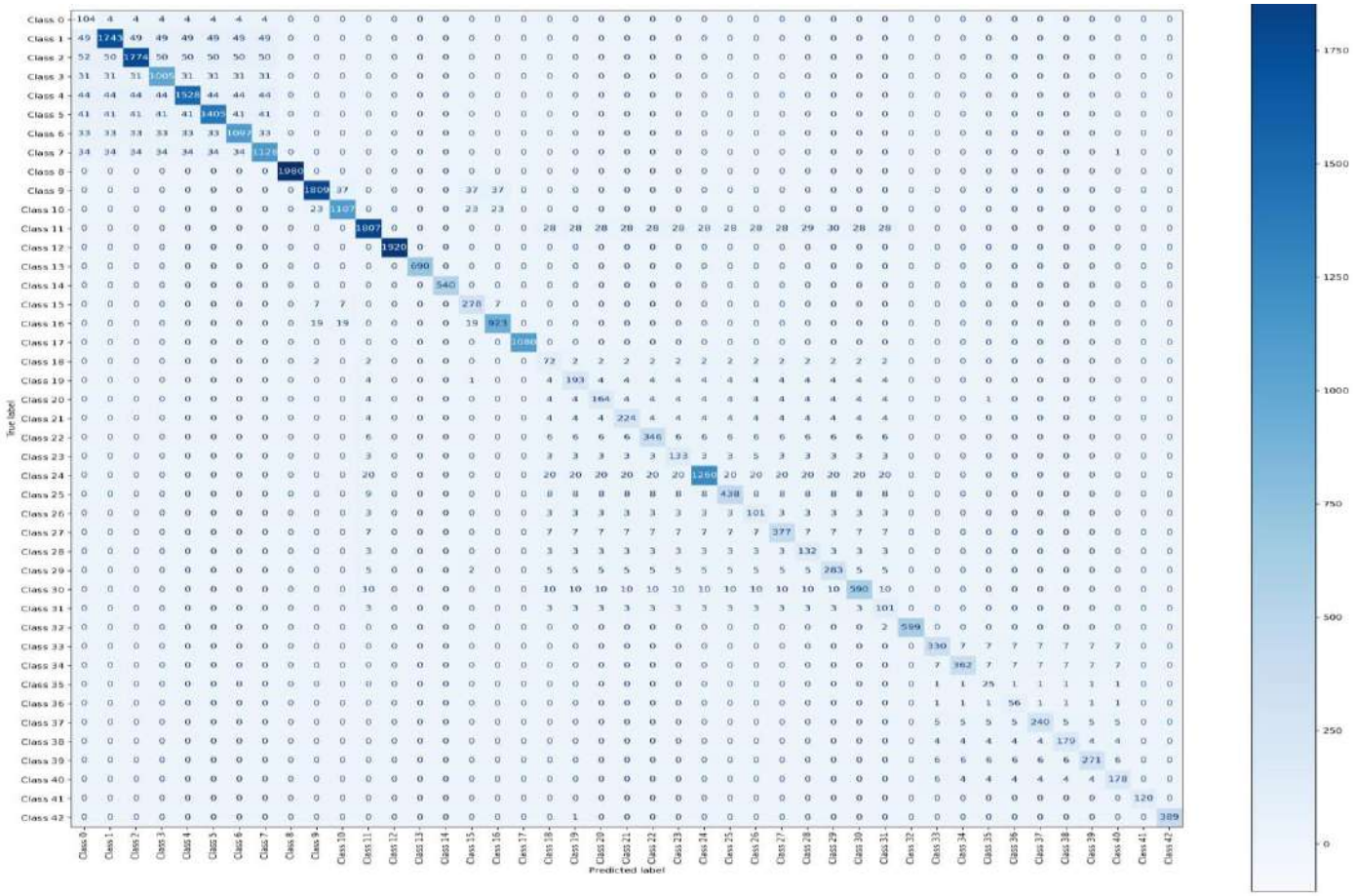

Figure 6
HOG and SVM Confusion Matrix for the GTSDB Dataset

With equal Precision, Recall, and F1-scores of 76%, the Decision Tree experimental results demonstrated that HOG features produced the most consistent and balanced performance. This supports the findings from the literature review, which showed that HOG's great capacity to capture shape and gradient information made it one of the best handmade feature descriptors for TSR. The empirical review also noted that several studies applying HOG to the GTSRB dataset achieved superior recognition rates, supporting the current findings. The resilience of HOG as a baseline feature extraction technique is further supported by the fact that it remained consistently strong across classifiers, even though the Decision Tree classifier generated lower overall scores than SVM (95.2%) and Random Forest (89.0%).

Both SIFT and LBP produced competitive results; SIFT matched HOG's F1-score while having poorer individual metrics, while LBP showed good precision and recall balance. While SIFT was praised for its invariance to scale and rotation but critiqued for its greater processing demands, this is consistent with other studies that highlighted LBP's effectiveness and applicability for real-time applications because to its low computing cost. Thus, the findings of this work are consistent with real data demonstrating that both LBP and SIFT continue to be formidable competitors in TSR tasks, particularly when resource limitations and transformation resilience are taken into account.

In contrast, BoW and Gabor filters were the least effective feature extraction techniques, with BoW producing the lowest F1-score (67%) and Gabor filters performing poorly across all metrics. This is consistent with the empirical

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review, where BoW was noted to lose important spatial information when representing traffic sign features, leading to weaker classification results. Similarly, Gabor filters, although theoretically effective in texture and edge detection, were reported to be computationally intensive and less adaptable in real-world TSR applications. The current study's findings therefore confirm these limitations in practice.

The stratified k-fold validation with four folds provided further confirmation of the reliability of these results. HOG in particular showed consistent performance across the three classifiers (SVM, Random Forest, Decision Tree), which strengthens confidence in its suitability for TSR tasks. This echoes the methodological practices highlighted in the reviewed empirical studies, where cross-validation was emphasized as critical for ensuring generalizable and unbiased performance evaluations.

Taken together, the results of this study reinforce the literature and empirical evidence: HOG remains the strongest handcrafted feature descriptor for TSR, particularly in terms of balanced performance across classifiers; LBP provides an efficient, lightweight alternative for resource-limited applications; SIFT offers transformation robustness but at higher computational cost; while BoW and Gabor filters are less suited for reliable TSR tasks, especially in contexts where accuracy and efficiency are both required.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Several important inferences can be drawn from the experimental data. With a performance difference of up to 29 percentage points in F1-score between the best and poorest approaches, the feature extraction strategy selection has a significant effect on classification performance. Second, out of all the classifiers, HOG features performed the best or very close to the best accuracy with SVM (95.2%), Random Forest (89.0%), and Decision Tree (76.2%). This illustrates how well it can capture the unique gradient and shape information found on traffic signs. Third, SIFT's computational complexity is a major disadvantage for real-time applications, even if it demonstrated exceptional invariance to transformation and obtained the greatest F1-score with SVM. Fourth, LBP was appropriate for systems with limited resources because it provided a good tradeoff between excellent performance and noticeably faster computation times. Ultimately, the findings demonstrate the importance of classifier selection, with SVM consistently outperforming Random Forest and Decision Tree as a competent but less accurate baseline across all feature types. With competitive accuracy of up to 96%, this study confirms that intricate handcrafted feature pipelines are still very successful at recognizing traffic signs.

5.2 Recommendations

This paper proposes several recommendations for improving traffic sign recognition systems. For applications where recognition accuracy is crucial, such as safety-critical autonomous driving systems, the use of HOG feature extraction combined with an SVM classifier is recommended for optimal accuracy. To ensure effective resource utilization, combining LBP features with a Random Forest classifier is suggested. Researchers are also encouraged to explore hybrid feature techniques that integrate the strengths of multiple extractors, particularly the combination of LBP's texture features with HOG's shape information. Moreover, special attention should be given to class imbalance in traffic sign databases, as performance on rare sign classes tends to lag behind more common ones, as indicated by confusion matrix analysis. Employing class-balanced sampling techniques or targeted data augmentation could significantly enhance system robustness. Finally, in scenarios where computing resources are limited or where feature interpretability is preferred over the black-box nature of deep learning, the handcrafted features evaluated in this study provide a reliable foundation for traffic sign recognition systems.

REFERENCES

Almaskati, D., Kermanshachi, S., & Pamidimukkala, A. (2023). Autonomous vehicles and traffic accidents. *International Scientific Conference "The Science and Development of Transport," 17*(3), 1–8. ELSEVIER. https://www.researchgate.net/publication/374947350_Autonomous_vehicles_and_traffic_accidents

Azhar, R., Tuwohingide, D., Kamudi, D., Suciati, N., & Sarjana, S. (2015). Batik image classification using SIFT feature extraction, bag of features and support vector machine. *Procedia Computer Science, 72*, 24–30. https://www.researchgate.net/publication/289735014_Batik_Image_Classification_Using_SIFT_Feature_Extraction_Bag_of_Features_and_Support_Vector_Machine

Ellahyani, A., & El Ansari, M. (2021). Traffic sign detection for intelligent transportation systems: A survey. *E3S Web of Conferences, 229*, 01040. https://doi.org/10.1051/e3sconf/202122901040

Fu, M.-Y., & Huang, Y.-S. (2010, December). A survey of traffic sign recognition. In *2010 International Conference on Wavelet Analysis and Pattern Recognition* (pp. 119–124). IEEE.

Licensed Under Creative Commons Attribution (CC BY-NC)

Jaiswal, A. K., & Banka, H. (2017). Local pattern transformation-based feature extraction techniques for classification of epileptic EEG signals. *Biomedical Signal Processing and Control, 34*, 81–92. https://www.sciencedirect.com/science/article/abs/pii/S174680941730006X?via%3Dihub

John, V., Boyali, A., & Mita, S. (2017). Gabor filter and Gershgorin disk-based convolutional filter constraining for image classification. *International Journal of Machine Learning and Computing, 7*(4), 55–60. https://doi.org/10.18178/ijmlc.2017.7.4.620

Khalid, S., Khalil, T., & Nasreen, S. (2014, November). A survey of feature selection and feature extraction techniques in machine learning. In *2014 Science and Information Conference* (pp. 372–378). IEEE. https://doi.org/10.1109/SAI.2014.6918213

Kiran, C. G., Prabhu, L., Varikkottil, A., & Kumaraswamy, R. (2009). Traffic sign detection and pattern recognition using support vector machine. In *Proceedings* (pp. 87–90). https://www.researchgate.net/publication/220781211_Traffic_Sign_Detection_and_Pattern_Recognition_Using_Support_Vector_Machine

Kuo, W. J., & Chiu, C. C. (2012). Content-based image retrieval with bag of visual words. *Journal of Information Science and Engineering, 28*(3), 655–668.

Luus, F. P. S., Salmon, B. P., van den Bergh, F., & Maharaj, B. T. J. (2015). Multiview deep learning for land-use classification. *IEEE Geoscience and Remote Sensing Letters, 12*(12), 2448–2452. https://doi.org/10.1109/LGRS.2015.2483680

Maletzky, A., Hofer, N., Thumfart, S., Bruckmüller, K., & Kasper, J. (2023). Traffic sign detection and classification on the Austrian highway traffic sign data set. *Data, 8*(1), 16. https://doi.org/10.3390/data8010016

Mikolajczyk, K., & Schmid, C. (2005). A performance evaluation of local descriptors. *IEEE Transactions on Pattern Analysis and Machine Intelligence, 27*(10), 1615–1630. https://doi.org/10.1109/TPAMI.2005.188

Nanni, L., & Lumini, A. (2012). Local binary patterns variants as texture descriptors for medical image analysis. *Artificial Intelligence in Medicine, 56*(1), 25–35. https://doi.org/10.1016/j.artmed.2012.07.001

Ojala, T., Pietikäinen, M., & Harwood, D. (1996). A comparative study of texture measures with classification based on feature distributions. *Pattern Recognition, 29*(1), 51–59. https://doi.org/10.1016/0031-3203(95)00067-4

Omid-Zohoor, A., Almeida, B., Taori, R., Murmann, B., & Chandraiah, P. (2018). Toward always-on mobile object detection: Energy versus performance tradeoffs for embedded HOG feature extraction. *IEEE Transactions on Circuits and Systems for Video Technology, 28*(5), 1102–1115. https://www.researchgate.net/publication/312476432_Toward_Always-On_Mobile_Object_Detection_Energy_Versus_Performance_Tradeoffs_for_Embedded_HOG_Feature_Extraction

Park, K. H., Wang, S.-W., & Wang, W.-H. (2014). Frequency-cepstral features for bag of words based acoustic context awareness. *The Journal of the Acoustical Society of Korea, 33*(4), 248–254. https://doi.org/10.7776/ASK.2014.33.4.248

Peng, F., Qian, L., Yang, J., Zhang, C., & Zuo, W. (2014). Feature coding in image classification: A comprehensive study. *IEEE Transactions on Multimedia, 16*(11), 2828–2840. https://www.researchgate.net/publication/239943155_Feature_Coding_in_Image_Classification_A_Comprehensive_Study

Rangayyan, R. M., Banik, S., & Desautels, J. E. (2010). Computer-aided detection of architectural distortion in prior mammograms of interval cancer. *Journal of Digital Imaging, 23*(5), 564–577. https://link.springer.com/article/10.1007/s10278-009-9257-x

Saadna, Y., & Behloul, A. (2017). An overview of traffic sign detection and classification methods. *International Journal of Multimedia and Information Retrieval, 6*(3), 193–206. https://doi.org/10.1007/s13735-017-0129-8

Sadeghi, B., Jafari, A. M., Vahdani, K., & Shahri, A. M. (2018). 2DIGH: A polar invariant local image descriptor based on joint histogram. *The Visual Computer, 34*, 1579–1595. https://www.researchgate.net/publication/319661560_2DIGH_a_polar_invariant_local_image_descriptor_based_on_joint_histogram

Singh, B. (2016). Iris recognition using curvelet transformation based on Gabor filter & SVM. *International Journal of Engineering and Computer Science, 5*(8), 17731–17735. https://doi.org/10.18535/ijecs/v5i8.32

Sugimura, D., Fujimura, T., & Hakura, T. (2016). Enhanced cascading classifier using multi-scale HOG for pedestrian detection from aerial images. *International Journal of Pattern Recognition and Artificial Intelligence, 30*(3), 1655009. https://www.researchgate.net/publication/283617136_Enhanced_Cascading_Classifier_Using_Multi-Scale_HOG_for_Pedestrian_Detection_from_Aerial_Images

Wali, S. B. (2015). Comparative survey on traffic sign detection and recognition: A review. *Przeglad Elektrotechniczny, 91*(10), 40–44.

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https://www.researchgate.net/publication/283617136_Enhanced_Cascading_Classifier_Using_Multi-Scale_HOG_for_Pedestrian_Detection_from_Aerial_Images

Wang, H., & Schmid, C. (2013, December). Action recognition with improved trajectories. In *2013 IEEE International Conference on Computer Vision* (pp. 3551–3558). IEEE. https://doi.org/10.1109/ICCV.2013.441

Zhang, Z., Gao, S., & Zhao, B. (2013). Multi-scale local binary pattern for texture classification. *Journal of Computational Information Systems*, *9*(7), 2561–2568.

Zhao, S. (2013). Image bag generator based on bag of visual words. *Journal of Information and Computational Science, 10*(5), 1453–1462. https://doi.org/10.12733/jics20101532

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Fake news on societal behavior: A case study of the youths in Nairobi County, Kenya

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ABSTRACT

Fake news is becoming a rising global concern through social media. This can influence public opinion as well as society through behavioral change and distortion of information. The study examined the link between fake news and social behavior of youths in Nairobi County, Kenya, specifically Nairobi City County. The research focused on how fake news was framed on social media, how it was managed, and how young people interpreted the news. The influence of fake news on the decision-making of youth was also the subject of this study, along with evaluating the effects of misinformation and the impact of news errors. The social responsibility theory and the media dependency theory guided the study on the interaction between fake news and youth. We used a descriptive research design to collect the views of the youth on the subject. The study targeted a population of 600 employees working with the Communications Authority of Kenya. Then, the study selected a sample of 240 respondents through simple random sampling using the Yamane formula. The data was collected using a well-structured questionnaire based on the objectives of the study. The analyzed responses were subjected to descriptive and inferential statistics, and the outcomes were presented by way of tables and charts. During the research process, principles such as voluntary participation, confidentiality, and participators' informed consent were adhered to. Fake news has a great impact on behavior of the society youth in Nairobi County. According to a recent study, social media is the most common medium through fake news is being spread throughout the world. Misinformation can damage trust in media, personal relationships and participation in civic affairs. Discrepancies like errors and bias in the news were seen as a big reason for people disbelieving news. Although they don't trust the news as much anymore, they trust less accurate sources just as much as before. The phony news stories were also directly related to the decision-making of youth which influenced their political choice. Some youths were resilient enough to check the veracity of the information before taking any action. However, the majority became vulnerable due to confirmation bias and reliance on something shared by their peers. Considering these findings, the study advised incorporating digital and media literacy programs into the educational system so the youth could be trained to evaluate things critically. The report advised independent fact-check validation processes should be strengthened. All media should continue to remain subject to ethical standards through professional codes. Social media companies should be made accountable for false news. Similarly, it calls for partnerships among various sectors. The goal is to work with youth to increase their resistance to fake news and support positive media behavior.

Keywords: Fake News, Nairobi County, Societal Behavior, Social Media, Youth

I. INTRODUCTION

The issue of fake news has become one of the most serious issues in today's time which is capable of distorting information, swaying opinion, changing behavior on a global scale. Prior to the onset of the internet age, newspapers, television, magazines and radios were our main sources of news. Yet, the internet and the growth of Information Technology changed how people receive news. Moreover, dissemination shifted to online platforms, web-based transmission, news websites, and social media (Olan et al., 2024). The speed and reach of social media platforms have allowed news to be consumed almost instantly. This has, as such, replaced the delay with which news would appear in cycles.

According to Aïmeur et al. (2023), worldwide, news that are fakes are defined as false information that are deliberately contrived to misinform the audiences or manipulate them. Although the term is usually for false news online, it has been politicized instead. It is sometimes used to discredit negative-yet-true coverage (Yao & Ngai, 2022). There are various reasons behind producing fake news. For instance, politically, financially and socially motivated news are common (Wang et al., 2022). Research finds that youths aged 18 to 34 years are the group most reliant on social media for news and information. Furthermore, Facebook, YouTube, Instagram, and X are the most popular channels, according to research (Vogels et al., 2025). The global implications of fake news are documented well. It is known to erode trust in conventional media, drive polarization and manipulate consumer behaviors. (Jais et al., 2021). Research has found that false reviews or deceptive promotional messages can trick consumers into buying non-existent and lousy

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quality goods (Cao, 2023). In addition, the dissemination of fake news often employs emotional manipulation that can trigger fear, anger, or sympathy. Consequently, this results in emotional outbursts and harmful social consequences (Mathew, 2022). Scholars stress that it is also essential to figure out what motivates people to spread lies to make countermeasures effective (Wang et al., 2022).

Fake news is not just a Western or developed phenomenon but is experienced very much in Africa and elsewhere in the Global South. Due to the rapid growth of ICT infrastructure in the region, youth are increasingly reliant on mobile phones and the internet for their communication, education and economic activities (Shen et al. 2023). With more and more people getting enrolled into the online world, disinformation and misinformation has been on the rise as well. There have been fears in Africa that many of the information that circulates on social media is unverified.

According to reports, most pictures and text shared online are usually not credible or hold advantageous narratives which can incite conflict and violate people's privacy rights (Denniss & Lindberg, 2025). Moreover, misinformation in the region often touches on sensitive political, ethnic and religious matters, which is likely to have a particularly severe impact on social cohesion.

The social sphere can come under misrepresentation due to which human relationships can become more complex. Moreover, stereotypes are reinforced and the functioning of our society gets disrupted. The studies of behavioral scientist show that the behavior of society is molded by the same communities that live in. Furthermore, exposure to wrong narratives can undermine years of work of communities that face injustice (Martin & Bolliger, 2023). For example, movements that promote division, fear or hatred may undermine healthy societal behaviors, such as tolerance, cooperation or conformity (Elsayed, 2024). Many societies on the African continent remain susceptible to fake news due to extremely limited capacities to detect and counter it (Shirish et al., 2021).

Fake news is rife in Kenya and Nairobi County in particular. The widespread use of smartphones, inexpensive data packages, and a quality ICT infrastructure have made it easy for fake content to circulate among the Kenyan audience (Mbithi, 2022). According to Yin (2023), the youth has ditched the traditional media outlets and started to depend on social media sites for news due to the immediacy, accessibility and interactive nature. Nevertheless, it is also home to misleading information as not everyone, including the celebrities, practices fact-checking.

The Media Council of Kenya (MCK) has consistently warned that over half of the content being posted on social media is unverified, not credible and usually violates privacy and dignity while operating at conflict (Denniss & Lindberg, 2025). Fake news in Kenya has been reported in several instances ranging from political misinformation with the elections to misleading claims over public health, consumer products and social events. The public is less trusting of both digital and traditional media due to such forms of misinformation that cause confusion.

Kenya's youth are particularly affected, given their high level of social media usage and their active participation in conversations and discussions. While some youths are becoming more careful and cross-checking information from multiple sources before sharing, many still go ahead and share unverified or what the peers are buzzing about. The impact of misinformation, therefore, can influence one's misunderstanding and attitudes, and moreover, it can affect people's political participation, buying decisions, and social relationships (Mbithi, 2022).

Fake news, which refers to false information propagated for malicious intent, is impacting how residents of Nairobi County behave. Communication experts have pointed out that misinformation can harm specific audiences and the general public. These negative impacts can influence decision-making, media trust, and civic engagement. In light of the above, it is important to assess how fake news has distorted the behavioral patterns of the youth in Nairobi and recommend ways through which it can be mitigated.

1.1 Statement of the Problem

According to Newman (2022), over half the world's population now relies on news circulated through online channels. This shift is also seen in Kenya. These days many Kenyans prefer to get their news through fast online channels. They do not stick to print and broadcast as before. Kenyan news media operations are regulated by the Communications Authority and other statutory organizations. However, the fast pace of evolution of information technologies brings challenges that can limit the full effect of these regulatory measures. There is an increasing challenge due to the spread of content by bloggers and untrained commentators who often give personal opinions rather than factual news, making it hard to ascertain credibility and reliability (Otieno & Owiti, 2022).

To get more views and readership, media companies are accused of publishing sensational and inaccurate content. This, however, has caused the public to start mistrusting the media to a certain extent. The erosion of credibility shows the importance of the role fake news plays. The causes of fake news include misinformation, social media, and news errors. The study hence pays special attention to these variables in order to understand how fake news informs societal behavior among youth in Kenya. According to Munene and Oloo (2024), the growth in the number of social media users and the increasing diversity of platforms has made it too complicated for government agencies, corporations, and businesses to control false messages from spreading. Although regulatory interventions are important, they alone do not constitute a sufficient response to the complexity and scale of the problem. Alternative approaches have also

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been suggested like having verification mechanisms, specialized fact-checking websites and digital tools. Mbithi (2022) adds that educational interventions can help users learn to assess online content critically and distinguish between true and false information. Evidently, despite all the regulatory and corrective efforts being employed to quell the fake news problem in Kenya, it is still a major issue. Particularly among youth who are the most active users of social media. So, there is need to study how far misinformation, social media, and news errors drive fake news impact society.

1.2 Specific Objectives

i. To evaluate social media influence on the societal behavior of youths in Nairobi County, Kenya.
ii. To analyze the effects of misinformation on the societal behavior of youths in Nairobi County, Kenya.
iii. To examine exposure of fake news on societal behavior among young people in Nairobi County, Kenya.
iv. To investigate the impact of news errors on the societal behavior of youths in Nairobi County, Kenya.

1.3 Research Questions

i. How does social media influence the dissemination of fake news among youth in Nairobi County?
ii. In what ways does misinformation affect societal behavior among youth in Nairobi County?
iii. What role do news errors play in shaping public opinion among youth in Nairobi County?
iv. How does fake news influence decision-making among youth in Nairobi County?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study merges Social Responsibility Theory and Media Dependency Theory to analyze the fake news and societal behavior of youths in Nairobi County. The two theories are complementary in that they help us be clear on the responsibilities of media actors and what level of reliance on media audiences should have.

2.1.1 Social Responsibility Theory

Media practitioners and institutions have an ethical obligation that was put forward by McQuail (2005) on Social Responsibility Theory to provide effective and fair media content to the public. Misinformation and disinformation are the crucial underpinning variables in this study which spread non-verified and sensationalised news erodes social stability and public trust. The accountability and ethical journalism normative focus of its theory makes it stronger and relevant, as this can serve as answer for fake news problems. Nonetheless, the subjectivity of this test, which depends on moral and ethical standards, poses a serious limitation. Since such standards differ from society to society, it can place undue burden on individuals or organizations (Zikargae & Gessese, 2025).

2.1.2 Media Dependency Theory

Media Dependency Theory explains how audience dependence on the media shapes perceptions, behaviors, and decision-making. This theory was formulated by Ball-Rokeach and DeFleur in 1976. The study applies the theory to the variable of social media and error news, which illustrates that the higher the dependence on the media, the greater the probability of fake news. One of the strengths of the theory, which should be noted, is its ability to explain cognitive, affective and behavioral effects of media. It is a very useful theory in the digital age. A flaw of this model is that it takes little account of the social, cultural, or economic factors that shape how people use media (Tandoc et al. 2017).

The combination of these two frameworks provides a more comprehensive theoretical perspective for the study. The ethical obligations of the content creators and the media institutions are emphasized in the Social Responsibility Theory whereas the audience's dependency on the media and the impact of unbalanced media environments is captured in the Media Dependency Theory. When put together, all the above will paint a vivid picture of how fake news propagates, why audiences fall prey to it and how it ultimately affects youth behavior in Nairobi County.

2.2 Empirical Review

The growth of social media worldwide has changed the way people get news and interact with society, with Facebook, Instagram, and X now the dominant platforms for news (Adegboyega, 2020). Although these platforms foster connectivity, they allow for misinformation and fake news generation. Lee's (2019) research revealed that unregulated social media facilitated the sharing of false information against the 2016 U.S. election. Misinformation can be especially harmful in public health and politics. Audiences prefer to stick to false beliefs than give them up even after they are corrected (Susmann & Wegener, 2022). Caceres et al. (2022) also pointed out that the miscommunication caused social discomfort and distrust in many areas of the world. Fake news refers to news, stories or hoaxes that are fabricated deliberately to mislead for ideological or financial gain. As noted by Talwar (2020), it causes people to have an adverse and negative perception or behavior. Furthermore, news errors have the potential to undermine journalistic credibility

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and trust in the media. For instance, Henke et al. (2022) shows how these errors can create doubt towards the media. Social media, misinformation, fake news, and errors in news threaten to undermine trust, distort decision-making systems, and impact behavior in diverse contexts, studies show.

Across the region, African societies experience similar problems but with unique social and political dynamics. According to Adeoye et al. (2021), social media is a vital tool for communication and collaboration during emergencies. As per Abiodun (2024), misinformation in Nigeria hampers political communication, civic engagement and divides communities while reducing trust in institutions. Audiences in less regulated environments are vulnerable to misinformation. Adams et al. (2023) finds that audiences in less regulated environments are particularly vulnerable to misinformation. Less regulated advertising environments can lie with little recourse for fact-checking. According to Mohamed et al. (2024) in Kenya, the spread of misinformation via Facebook and X exacerbated political crises and divisions in society, affecting the lifestyle of people and leading to long-term unrest. This finding indicates that misinformation, fake news, and news errors interact in a regional context and are often compounded by socio-economic vulnerabilities and weak enforcement.

At the local level, the literature emanating from Kenya sheds some light on the dynamics of fake news and societal behavior. According to Kamau (2017), the youth of Kenya see social media as the primary source of their information despite being perceived as unreliable. According to Maweu (2019), over-utilization of social media negatively influences student performance in Kitui, showing that people's behavior changes as they engage online. According to Maweu (2019), the impact of fake news on the 2017 general elections resulted in protests due to distrust of electoral agencies. Fake news during the elections created a high expectation that public trust in democracy and security would be undermined (Lee, 2019). The Kamau and Shiundu (2024) explained that unlike newspapers, the unverified online news has made it easier to spread false information rapidly. For instance, the Nation Media Group suffered legal penalties over false news about a public figure whose credibility the public trusted (Kamau & Shiundu, 2024). The local findings reveal that social media misinformation, fake news, and errors by news organizations interrelate in their impact on behavior in Nairobi. The youth in Nairobi are the most active consumers of digital content.

III. METHODOLOGY

3.1 Study Area: Nairobi County, Kenya

Nairobi County, Kenya's capital city, is the political, economic and communication centre of the country. The population of Nairobi exceeds 4.3 million people, most of whom are youth under 35 years of age (Kenya National Bureau of Statistics [KNBS], 2019). The information and communication technology (ICT) sector is growing rapidly in the county and the cellphone penetration is high. Further, people have access to the internet. Nairobi is an essential center for the study of how youth use social media and other online platforms as their primary source of news and information.

As a multicultural urban center, Nairobi combines a wide range of ethnic, cultural, and socio-economic groups, thus making for a good setting to study the impact of fake news on society. Young people use social media platforms like Facebook, Instagram, X, and YouTube for political discussions, entertainment, education, and social networking. Although these platforms increase participation and connectivity, they also act as major conduits of misinformation, disinformation and news error that shape understandings, influence decisions, and impact civic engagement.

Nairobi is where the national government offices, business corporations, universities and media houses are located. The Communications Authority of Kenya's (CA) presence in the county reinforces Nairobi's role as the centre for regulation of information and communication policy. Yet, despite this, there is no stopping the fake news caravan. The active political culture in the county and the usage of internet by youth allows for easy creation and circulation of disinformation especially during elections and other social important events. These dynamics make Nairobi County an appropriate study setting to investigate the relationship between Fake News and Youth Behavior in society. The high level of digital penetration, the socio-cultural diversity of the population, and a highly active youth demographic make it a mini-India which is an excellent reproduction of what happens in the nation. Fake news has begun to interfere in matters of social interactions, trust of citizens in institutions, and civic engagement among the general citizenry.

3.2 Research Design

A descriptive research design was used in the present study employing a mixed method. The reason for selecting a descriptive design is because it is appropriate for studying contemporary phenomenon as they occur in their natural settings without manipulation. With this design, the researcher can receive feedback from the respondents on the perception, attitude and behavior of the society due to fake news. By examining existing conditions, the descriptive approach enabled the study to provide a comprehensive account of the patterns and relationships involved in the spread and impact of misinformation, news errors and fake news on youth. The power of this design is that it produces factual and contextual data so that we get insights into things happening in the real world and not mere assumptions or

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projections. Furthermore, this method made possible systematic observation and quantifiable data collection, while also enabling qualitative perspectives that help interpret the findings. By doing this, the study not only captured what was happening but helped understand why some behaviorally responses occur. Thus, it helps achieve the objective of the study with efficiency.

3.3 Target Population and Sample Size

As per Mugenda and Mugenda (1999), population refer to persons which you expect to note and which have similar traits. The researcher must concentrate this characteristic of the work. The Communications Authority of Kenya in Nairobi County supplied the 600 employed youths that were the focus of this research. The organization employs 800 people, of which most are young people in the age group of 35. The researcher targeted youths aged not less than 25 years of age. This organization was chosen as it plays an important role in communication trends especially through social media as well as the dissemination of news. It helped the researcher maintain her energy and other resources for the targeted organization and help obtain effective results of the study. The targeted population was spread across the following departments: Corporate Communications, Consumer and Public Affairs, Cyber Security, Licensing, Compliance and Standards.

Multiple research study has adopted a simple random sampling to collect data. This is a probability sampling model. Thus, in this case, each person in target population has an equal chance of selection. Further, each person has an independent chance of selection. The researcher randomly picks a sample of the population, which are the selected participants, to complete the issued questionnaires. The employed youth numbering to 240 were surveyed in order to obtain factual data on social media and behavior of the youth. Bryman (2019) described sample as part of the larger group that a researcher extracts for analysis in his book.

The sample size was calculated using the Yamane formula in the table below:

$$n = \frac{N}{1+Ne^2}$$

Where:

n=Sample Size
N= Population size (600)
e -Marginal error (0.05)
n=600/1 +600x 0.0025
n=600/1+1.5
n=600/2.5
n=**240**

Therefore, 240 employed youths were included in the study using a sample chosen from Nairobi's target population.

3.4 Data Analysis

According to Mugenda and Mugenda (1999), after survey data is collected, the researcher studies the data and interprets the meaning. The questionnaires' responses were first entered into Microsoft Excel and later transferred into SPSS Version 30 for analysis. Descriptive analysis was used to summarize and describe the research data, while inferential analysis tested the relationship between independent and dependent variables. Data was presented using chart and tables. Similar findings were identified with previous studies and reviewed literature. The simple linear regression formula is a model established by the model.$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

Y - Youth Behavior
b_0 - the intercept
X_1 – Effect of Social media on youths behaviour
X_2 – Effect of Misinformation on youths behaviour
X_3 – Effect of News error on youths behaviour
$\beta_1 - \beta_3$ - factor coefficients
ε is the error term

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study targeted a sample size of 240 respondents. Out of the distributed questionnaires, 218 was filled and returned, showing 90.8% response rate which is an excellent figure; being very useful for analysis and interpretation. The response rate was high because research assistants checked on their responses or were physically present at the institution. A response rate exceeding 80 percent is generally considered adequate in social research.

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4.2 Demographic Characteristics of Respondents

The demographic profile of the respondents according to bio-data section of the questionnaire has been presented in this section. The information includes their gender, age, work experience in the organization, level of education, and time using social media. The above characteristics give meaning to how fake news shapes the youth behaviors within Nairobi County's community.

4.2.1 Gender

Table 1

Gender of Respondents

Gender	Frequency	Percentage (%)
Male	120	55.0
Female	98	45.0
Total	**218**	**100**

The results show a fairly balanced gender distribution, with a slight male majority among the respondents.

4.2.2 Age of Respondents

Respondents were asked to indicate their age bracket. The results are presented in Table 2.

Table 2

Age of Respondents

Age Bracket	Frequency	Percentage (%)
25-27 years	30	13.8
28–30 years	110	50.5
31–35 years	52	23.9
36–40 years	26	11.9
Total	**218**	**100**

A majority of respondents were aged between 25 and 35 years, aligning with the target demographic of youth and early-career professionals.

4.2.3 Duration of Employment

Respondents were asked how long they had worked at the Communications Authority. Table 3 presents their responses.

Table 3

Length of Employment

Years of Service	Frequency	Percentage (%)
1–5 years	98	45.0
5–10 years	76	34.9
10–15 years	30	13.8
More than 15 years	14	6.4
Total	**218**	**100**

The findings indicate that nearly half of the respondents had been employed at the institution for between 1 and 5 years, indicating a relatively young and dynamic workforce.

4.2.4 Educational Level

The respondents' highest level of education was also recorded and is shown in Table 4.

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Table 4

Education Level of Respondents

Education Level	Frequency	Percentage (%)
Diploma	46	21.1
Bachelor's Degree	124	56.9
Master's Degree	48	22.0
Total	**218**	**100**

Most respondents held a bachelor's degree, suggesting that the study engaged a well-educated sample with adequate media literacy and professional exposure.

4.2.5 Duration of Social Media Use

Respondents were asked how long they had been using social media platforms. Results are shown in Table 5.

Table 5

Duration of Social Media Use

Duration	Frequency	Percentage (%)
1–5 years	34	15.6
6–10 years	104	47.7
11–15 years	62	28.4
More than 15 years	18	8.3
Total	**218**	**100**

The majority of respondents had used social media for between 6 and 10 years, indicating long-term engagement with digital platforms which is relevant to the study's focus on fake news.

4.3 Presentation of Findings

4.3.1 Social Media on the Dissemination of Fake News among the Youth in Nairobi County

Social networking platforms have become the most preferred application through which people, in particular youth, get news. However, their speed and interactive nature have also become facilitators of misinformation and disinformation on the platform. The laid-back format of user-generated content makes it easy for news to "go viral", after which there is despondence at people's inability to tell fake news apart. This study therefore probed the respondents' perception of the role of social media in the spread of fake news.

Table 6

Influence of Social Media on Dissemination of Fake News

Statement	SA	A	N	D	SD	Mean	Interpretation
Social media platforms are my primary source of news	88	96	18	10	6	4.15	Agree
I often encounter unverified or misleading information on social media	102	84	20	8	4	4.26	Agree
Social media allows rapid sharing of information, including fake news	110	80	14	10	4	4.32	Agree
I rarely verify the authenticity of news before sharing it	54	80	36	32	16	3.47	Neutral
Fake news spreads faster on social media than on traditional media	120	70	12	10	6	4.33	Agree

According to the results, it shows that most of the respondents agreed that fake news can spread through social media (M=4.15). According to most respondents, social media is their main source of news, and most have seen unverified or erroneous content. The respondents also considered social media a platform for the quick dissemination of any information, including misinformation (M=4.32). The mean score on whether to check information before sharing it was relatively neutral, indicating inconsistent behaviors among users. This suggests that there is a gap in digital literacy or awareness of the adverse effects. The research confirms that social media is the main channel through which most fake news gets into the youth in Nairobi County (M=4.33). Because social platforms are so close to people, it results in a quick spread of information. But at the same time, the unverified news can take a toll too. The results showed that social media is used for news by most youths in Nairobi County. The respondents revealed that they mostly come across unverified or fake information on social media. This is in tune with Adegboyega (2020), who observes that social media has become one of the most powerful sources of information in the world, notwithstanding, capable of spreading falsehood.

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Table 7

Influence of Social Media on the Dissemination of Fake News

Statements	SA	A	N	D	SD	Mean
I have adopted or supported social views that were later proven to be false	52	74	40	36	16	43.6
Misinformation has led to arguments or tension in my workplace or community	64	86	36	22	10	4.39
Exposure to fake news makes me more cautious and anxious about social issues	80	96	20	14	8	4.62
I have changed my behavior (e.g., avoided places or people) based on fake news	58	76	42	30	12	3.81
Misinformation has influenced my perception of certain social groups	76	88	28	18	8	4.48

The graphical distribution reveals that most respondents agreed and strongly agreed with statements suggesting this social media was the main forum where fake news propagates. The statement “Exposure to fake news makes me more cautious and anxious about social issues” received the most score for strong approval (M=4.39). In the same boat, the message “Misinformation has influenced my perception of certain social groups” secured high agreement levels too, indicating a widespread sentiment of social media being a misinformation magnifier (M=4.39). The statement " I have changed my behavior (e.g., avoided places or people) based on fake news " showed a fairly even distribution of responses across the Likert categories, with few respondents strongly agreeing (M=3.81). This indicates that there is some sort of engagement between the content and the user, suggesting that not all users share such content without critical thought. Survey data finds youth believe social media is the most significant means through which fake news is disseminated in the country. The analysis of the frequency of the agreement with the statements points towards the conclusion that exposure to fake news on social media is an important influencer of the information environment among the youth in Nairobi. In the same vein, Lee (2019) explained the spread of false information through social media during the U.S. elections and how social media can distort democracy. According to Kamau (2017) a local study has showed that young Kenyans are heavy consumers of social media for information but are doubtful of its credibility. The study found that most respondents rarely check the content before sending it out. This corresponds with the findings from a study by Maweu (2019), which showed that the youth in Kitui suffered negative behavioral problems from their use of social media. Also, youth lack the ability to verify the authenticity of information before sharing.

4.3.2 Misinformation on the societal behavior of youth in Nairobi County

Misinformation is one of the most communicational environment challenges affecting how individuals, especially youth, view and act upon social issues. The fast spread of false or misleading information online harms trust in the news media and affects decision-making, civic engagement and relationships with others. In Nairobi County, where the youth heavily rely on social media for information, misinformation can distort social behavior by fueling polarization, instigating reactionary behavior and undermining confidence in institutions. The next table provides data on the impact of misinformation on the social behavior of youth in the study area.

Table 8

Effects of Misinformation on Youth Societal Behavior

Statement	SA	A	N	D	SD	Mean	Interpretation
Misinformation has influenced my perception of certain social groups	76	88	28	18	8	3.90	Agree
I have changed my behavior (e.g., avoided places or people) based on fake news	58	76	42	30	12	3.60	Agree
Exposure to fake news makes me more cautious and anxious about social issues	80	96	20	14	8	4.00	Agree
Misinformation has led to arguments or tension in my workplace or community	64	86	36	22	10	3.78	Agree
I have adopted or supported social views that were later proven to be false	52	74	40	36	16	3.50	Neutral

The research shows that misinformation has a visible impact on social behavior of youth. Most of the respondents believed that they have been affected by fake news about social groups which sometimes led them to act in a different manner to an extent (M= 3.60). Many others also reported increased anxiety and caution because of misleading news and misinformation, especially involving sensitive social or political issues (M=4.00). Interestingly, many of them agreed that they have participated in an action caused by misinformation. However, the responses given to the last item showed quite a neutral agreement (M=3.50). It may mean that they are reluctant to admit they were misled or are simply ignorant that their previously held beliefs were wrong. According to the data, false information can change relationships, behaviors, and the mood of a community in society. This shows that the framework that if left unchecked, fake news can lead to attitude and behavior change especially in our youths who are more connected. The

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findings revealed that misinformation skews youth's ideas about social group, creates anxiety and in some cases, influences change in the behavior in order to not go to that place or not meet that person. In their publication, Susmann and Wegener (2022) state that misinformation sticks even when it's corrected. This affects people's opinions and actions.

Table 9

The Influence of Social Media in the Dissemination of Fake News

Statements	SA	A	N	D	SD	Mean
Social media are my primary news source	88	102	110	54	120	94.8
I often encounter unverified information	95	85	80	80	70	82
Social media allows rapid sharing of fake news	10	10	10	32	8	14
I rarely verify news before sharing	6	4	5	16	4	7
Fake news spreads faster on social media	6	4	5	16	4	7

The visual spread shows many participants mostly strongly agree or agree that social media is a dominant source of news and is a significant facilitator of spreading misinformation. The social media spreads information (fake news has been used here) like wildfire and faster than traditional media, scored maximum number of Strongly Agree responses. This agrees with the popular belief that social media does indeed spread fake news faster than other platforms. Likewise, the statement has a high level of agreement that "Social media enables the fast sharing of information, including fake news." This further implies that the structure of social media allows the sharing of information without restrictions. Current research attributes the primary reasons for misinformation amplification to algorithmic curation and user engagement features. Youth strongly agreed with the statement "I often come across unverifiable or misleading information on social media", showing that young people are conscious of misinformation surrounding them. In contrast to the former example, the statement "I rarely verify the authenticity of news before sharing it" produced a more spread-out response pattern. This means that while many agree with the statement that fake news is widespread, not all are equally passive or negligent consumers. The table shows that social media is a major source of news, though people are aware to its potential misinformation. According to Social Responsibility Theory, media users and media platforms have an obligation to ensure the dissemination of accurate and reliable content. These findings strengthen the applicability of this theory. Caceres et al. (2022) reported that misinformation during COVID-19 increased distress in society. Similarly, in Nairobi, respondents noted an increase in caution due to fake news. According to a study conducted within Nigeria by Abiodun (2024), misinformation eroded civic engagement and political trust. Locally, Mohamed et al. (2024) identified misinformation as a driver of political crises in Kenya, echoing the disruptive impacts noted in this study.

4.3.3 Fake News on the Decision-Making of Youth in Nairobi County

Fake news is not just ordinary misinformation. Unlike misinformation, fake news is made up on purpose to mislead us. Young people living in Nairobi County consume information from live digital platforms much more than any other medium. Exposure to fake news helps shape perceptions, attitudes, and collective actions among them. This influence extends to sensitive areas such as politics, health and social relations, where false narratives can easily influence opinion and trigger emotion. The study offers an understanding of the impact of fake news on youth alteration behavior after analyzing the data.

Table 10

Influence of Fake News on Youth Decision-Making

Statement	SA	A	N	D	SD	Mean	Interpretation
I have made decisions based on news that was later found to be fake	62	88	32	24	12	3.76	Agree
Fake news influences my views during elections or civic engagement	84	92	18	14	10	4.00	Agree
I sometimes support causes based on emotional reactions to fake news	70	80	30	26	12	3.78	Agree
Fake news content often influences my opinion on national policy issues	64	86	28	24	16	3.72	Agree
I now take more time to verify content before making important decisions	76	90	22	20	10	3.93	Agree

A high number of respondents stated that they made some decisions based on false or misleading information and some said they were emotionally affected by false information (150 of 218 respondents). The respondents were also worried that fake news will affect their political choices and support for a public cause. The last sentence, one that the exposure of fake news has initiated a more careful analysis of the information being processed. Many respondents now more carefully verify the information they see before forming an opinion or making a decision. The study reveals that

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youths don't verify the information and require training for the same (166 of 218 respondents). Fake news affects the decision-making process of youth, especially with respect to elections and civic engagement. Respondents reported making decisions based on fake news and pledging their support to emotional appeals. This matches with Talwar's (2020) worldwide examination, which identified imitation news to have severe behavioral consequences on social media clients. Yin (2023) also associated false news with its ideological and financial motivations and exploitation of emotions.

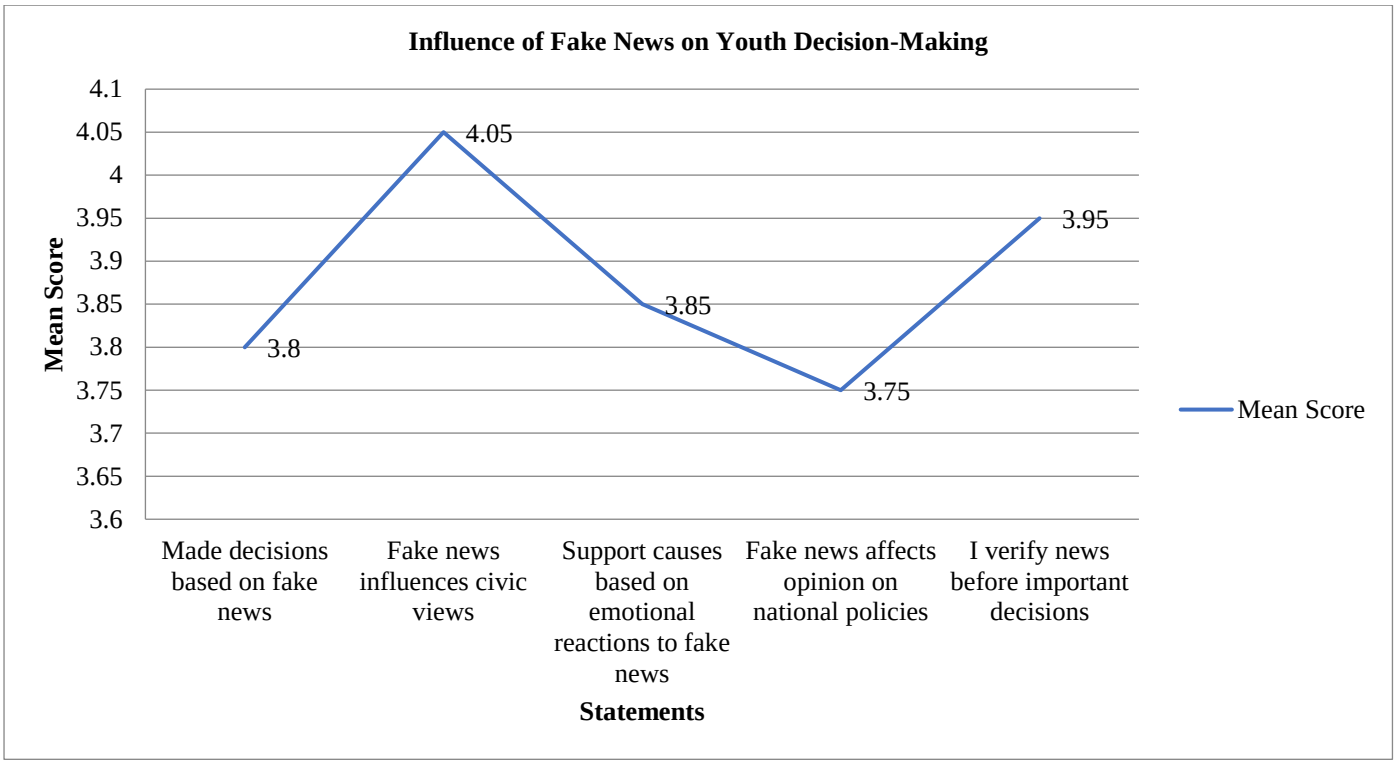

Figure 1
Influence of Fake News on Youth Decision-Making

As can be seen from the graph, the mean score of all statements is more than 3.5 indicating general agreement. The statement with the highest mean score was "Fake news influences my civic views." This indicates that many respondents perceive that fake news influences their socio-political views. Fake news can intrude and pervert public perceptions of civic issues, the finding shows. These findings suggest that exposure to disinformation may have resulted in an unusual positive behavioral adaptation of youth, as seen from their high agreement with the statement, "I check news before taking important decisions." This demonstrates that they are increasingly aware of the potential harm that fake news can cause. Statements like "Support causes based on emotional responses to fake news" and "Fake news influences opinion on national policies" also recorded moderate mean scores, indicating that emotional and policy-related decisions are susceptible to manipulation by fake news. Even though this figure has the second lowest mean, it still shows that a good number of people have made decisions based on false news. The graph indicates that fake news impacts the choices made by the youth in Nairobi. According to the findings of the present study, some youths of today take more time to verify content. Similarly, Maweu (2019) finds that fake news in the 2017 Kenyan elections misled some audiences while pushing others toward skepticism and verification practices. These findings support the Media Dependency Theory, which suggests that when uncertainty exists, audiences will turn to the media for decision-making.

4.3.4 News Errors in Shaping Public Opinion among Youth in Nairobi County

Whether intentional or unintentional, news errors – negligence, lack of fact-checking and hasty reporting – are a further distortion of information in the media ecosystem. Unlike deliberate disinformation, mistakes result from inherent weaknesses in our editorial standards or the pressures of immediacy. Inaccuracies such as these have the potential to undermine the confidence of the youth in Nairobi County in media institutions and, consequently, affect the acquisition of knowledge and social interactions based on incorrect information. The findings in this section show how news errors lead to negative social behavior of young people.

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Table 11

Role of News Errors in Shaping Public Opinion

Statement	SA	A	N	D	SD	Mean	Interpretation
I have encountered factual errors in news reports that influenced my opinions	70	94	24	18	12	3.88	Agree
Corrections or apologies by media houses reduce the impact of news errors	56	82	34	28	18	3.55	Agree
News errors make me skeptical about future reports from the same source	92	86	18	14	8	4.04	Agree
I rely on more than one source of information to confirm the accuracy of news	88	96	20	8	6	4.15	Agree
News errors often lead me to reevaluate my views on ongoing issues	66	78	34	28	12	3.72	Agree

According to the findings, the errors in news contribute significantly to the making and re-making of youth opinion. Many respondents pointed out the presence of factual errors in media content that affected their interpretation of events or issues. Most also stated that these mistakes create doubts and they will not quickly believe the news, but will confirm from different sources first. In the event of any defects in the news, would it help to correct and apologize? A sizeable number of respondents agreed to this. The same shows youngsters being more conscious of the media. They seem to engage with the news more critically and aware about the journalistic errors. Another clear implication that can be derived from this sentence is that news error perceived as a cause of skepticism indicates an erosion of trust in single media. The results shown that news errors create a major impact on the public. It reduces their faith in a media source. And youngsters are fact-checking the information through other media sources as well. Henke et al. (2022) has shown that typesetting errors and factual mistakes in news articles thwart audiences from retaining information and assessing credibility. Newman et.al. (2022) also noted that mistakes reduce trust in media throughout the world.

Table 12

Role of News Errors in Shaping Public Opinion

Statements	SA	A	N	D	SD
News errors influenced my opinions	35	40	10	10	5
Corrections reduce the impact of news errors	25	35	20	12	8
News errors reduce my trust in sources	35	40	15	7	3
I cross-check news with other sources	40	40	15	4	1
News errors make me reevaluate my views	30	35	15	15	5

The table shows that most of the participants agreed or strongly agreed with the statement that the errors in news made them change their opinion. Majority of the responses were either Strongly Agree or Agree. There was also a high level of agreement with the statement "News errors reduce my trust in source," reflecting a belief that media accuracy issues degrade trust in other sources. The response category that was the most decisive, was the solutions to the statement "I cross-check the news with other sources". In this statement, most of the respondents said that they take a personal initiative to verify news content. It shows that the youth today are becoming more media savvy due to more repeated reporting of inaccuracy by the media. Most agree that corrections or apologies lessen the impact of news errors – but a substantial chunk of readers are neutral or doubtful. This shows that while media accountability is appreciated, it will not always bring full accountability when public trust is lost. Regarding the final statement, "News errors make me think twice about my views", we find moderate agreement. If errors lead us to rethink our views, it will depend on the opinion holder and the issue at hand. The graphic demonstrates that the mistakes made by the media have a measurable consequence on the people, with the trust in media and fact-checking driven by past experiences. According to Kamau and Shiundu (2024), the Nation Media Group was fined in Kenya due to inaccurate stories. This shows how the wrong news can affect society. The tendency of the respondents to search for more than one source for verification purposes proves that errors, without correction, will result in doubt and negative views of the media by the audience (Munene & Oloo, 2024). According to Social Responsibility Theory, the media ought to publish accurate news information and it is not in their hands but in the audience's hands anymore when they on the degree of reliance measured. Similarly, according to Media Dependency Theory, the more trust in the media (in this case Twitter), the more reliance on media to form opinions on the issue.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

One conclusion is that the widespread unverified material on social media has made fake news flash viral among the youth of Nairobi. Although these sites are immediate and accessible, their structures tend to prioritize popular

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content. This makes them biased towards outrageous and emotionally appealing material, irrespective of its veracity. Many people are not used to checking the facts. Moreover, their friends keep sending them fake news that is trending. This does become visible to them.

First, disinformation has tangible and sometimes disruptive effects on behavior. It makes to feel fear, anger and empathy as well as how they become involved in the community, look at their relationships and understand social issues. This can also reinforce stereotypes, create or deepen social divides, and even discourage participation in civic engagement altogether. They show how harmful misinformation can be for society as the public sphere becomes more digital.

Second, mistakes made by the news, likely unintended or due to editorial slips, influence public opinion. Once people form their opinion based on incorrect information, they usually do not change them even after correction. This lasts a long time. Thus, it undermines trust in media institutions. People then turn to alternative sources of information. The problem is that these may be less trustworthy. This shows that media must exhibit a strong commitment to standards of accuracy and transparency.

In the end, fake news has a direct effect on youth's decision-making concerning political participation, consumption, and social activism and participation. Some people check the facts and sources of news. But others stick with the sources they know. They choose to take news that fits with their ideology. This leaves a large part of the youth population susceptible to manipulation, especially if the misinformation is consistent with their beliefs or supported by people in their networks.

5.2 Recommendations

The research suggests ways to address fake news influence on youths in Nairobi County through a multidisciplinary approach. Indeed, the very first step would be to include digital and media literacy in the educational curriculum so that young people can think critically and fact-check. The promotion of independent fact-checking initiatives and public awareness campaigns to counter misinformation in real time further complements this plan. It is also important that media practices are subject to high ethical standards. Hence, news organizations must incorporate high-level verification of facts, while professional bodies must ensure accountability. Alongside this, social media platforms must be regulated to detect, flag and remove false content on their site within a designated time frame, preferably using local fact-checkers. Peer-led interventions, such as workshops and influencer campaigns, are effective in promoting responsible sharing among youth, it notes. It is also advised to continuously research and monitor the fake news trends. Similarly, universities, think tanks, and community organizations must join hands to design evidence-based measures. In conclusion, the report highlights the need to embed misinformation awareness into civic education and calls for cross-sector partnerships between government, academia, media and civil society to develop coordinated, sustainable strategies. All of these options would make the youth more critical, responsible, and resilient.

REFERENCES

Abiodun, A. (2024). The Impact of Fake News and Misinformation on Political Communication and Civic Engagement in Nigeria. *International Journal of Communication and Public Relation*, *9*(1), 26 – 37.https://doi.org/10.47604/ijcpr.2272

Adams, Z., Osman, M., Bechlivanidis, C., & Meder, B. (2023). (Why) is misinformation a problem?. *Perspectives on Psychological Science*, *18*(6), 1436-1463. https://doi.org/10.1177/17456916221141344

Adegboyega, L. O. (2020, April). Influence of Social Media on the Social Behavior of Students as Viewed by Primary School Teachers in Kwara State, Nigeria. *In Elementary School Forum (Mimbar Sekolah Dasar)* (Vol. 7, No. 1, pp. 43-53). Indonesia University of Education. Jl. Mayor Abdurachman No. 211, Sumedang, Jawa Barat, 45322, Indonesia. Web site: https://ejournal. upi. edu/index. php/mimbar/index.

Adeoye, A. A., Onuoha, C., Obiano, D. C., & Motunrayo, O. (2021). Social media as a collaborative tool for research among library and information science (LIS) professionals in Nigeria. *Library Philosophy and Practice (e-journal)*. *https://digitalcommons. unl. edu/libphilprac/5137*.

Aïmeur, E., Amri, S., & Brassard, G. (2023). Fake news, disinformation and misinformation in social media: a review. *Social Network Analysis and Mining*, *13*(1), 30. https://doi.org/10.1007/s13278-023-01028-5

Ball-Rokeach, S., & DeFleur, M. L. (1976). A dependency model of mass media effects. *Communication Research*, *3*(1), 3–21. https://doi.org/10.1177/009365027600300101

Bryman, A. (2019). *Social research methods* (5th ed.). Oxford University Press.

Caceres, M. M. F., Sosa, J. P., Lawrence, J. A., Sestacovschi, C., Tidd-Johnson, A., Rasool, M. H. U., ... & Fernandez, J. P. (2022). The impact of misinformation on the COVID-19 pandemic. *AIMS public health*, *9*(2), 262. https://doi.org/10.3934/publichealth.2022018

Licensed Under Creative Commons Attribution (CC BY-NC)

Cao, C. (2023). The impact of fake reviews of online goods on consumers. *BCP Business & Management*, *39*, 420-425. https://doi.org/10.54691/bcpbm.v39i.4208

Denniss, E., & Lindberg, R. (2025). Social media and the spread of misinformation: infectious and a threat to public health. *Health promotion international*, *40*(2), daaf023. https://doi.org/10.1093/heapro/daaf023

Elsayed, A. (2024). Societal behavior and cultural responses to misinformation. *Journal of Social Change in Africa, 9*(1), 66–82.

Henke, J., Holtrup, S., & Moehring, W. (2022). Forgiving the news: The effects of error corrections on news users' reactions and the influence of individual characteristics and perceptions. *Journalism Studies*, *23*(7), 840-857. https://doi.org/10.1080/1461670X.2022.2044889

Jais, N. M., Mustafa, H., Mukhiar, S. N. S., & Jamaludin, S. S. S. (2021). Generational trends in emerging media consumption: A COVID-19 scenario. *SEARCH Journal of Media and Communication Research*, Special Issue: ICEMC 2021, 81-95.

Kamau, D. (2017). Social media and youth behavior in Kenya. *Nairobi Journal of Social Studies, 5*(1), 44–59.

Kamau, S., & Shiundu, A. (2024). Investing in fake news? The disinformation industry in Kenya's 2022 elections. *State-Sponsored Disinformation Around the Globe*, 194-215.

Kenya National Bureau of Statistics. (2019). *2019 Kenya population and housing census, volume I: Population by county and sub-county*. KNBS. https://www.knbs.or.ke

Lee, T. (2019). The global rise of "fake news" and the threat to democratic elections in the USA. *Public Administration and Policy*, *22*(1), 15-24. https://doi.org/10.1108/PAP-04-2019-0008

Martin, K., & Bolliger, D. (2018). Social media use and news consumption patterns. *Journal of Educational Technology, 35*(3), 25–38. https://doi.org/10.24059/olj.v22i1.1092

Mathew, P. (2022). Fake news and its harmful effects on society. *Journal of Global Media Studies, 14*(1), 14–28.

Maweu, J. M. (2019). "Fake elections"? Cyber propaganda, disinformation and the 2017 general elections in Kenya. *African Journalism Studies*, *40*(4), 62-76. https://doi.org/10.1080/23743670.2020.1719858

Mbithi, A. (2022). The impact of social media misinformation in Kenya. *Kenya Communication Review, 10*(2), 55–72.

McQuail, D. (2005). *McQuail's mass communication theory* (5th ed.). Sage Publications.

Mohamed, R. A., Radoli, L., & Aswani, R. (2024). Social Media Amplification of Political Rhetoric in Kenya: The case of the 2022 General Elections. *Journal of African Interdisciplinary Studies*, *8*(9), 146-164.

Mugenda, O. M., & Mugenda, A. G. (1999). *Research methods: Quantitative and qualitative approaches*. Acts Press.

Munene, M. M., & Oloo, D. (2024). Role of Social Media Platforms in the Spread of Fake News in Nyeri County, Kenya. *African Journal of Empirical Research*, *5*(2), 229-239. https://doi.org/10.51867/ajernet.5.2.21

Newman, N. (2022). Overview and key findings of the 2022 Digital News Report. Reuters Institute for the Study of Journalism. https://reutersinstitute.politics.ox.ac.uk/digital-news-report/2022/dnr-executive-summary

Olan, F., Jayawickrama, U., Arakpogun, E. O., Suklan, J., & Liu, S. (2024). Fake news on social media: the impact on society. *Information Systems Frontiers*, *26*(2), 443-458. https://doi.org/10.1007/s10796-022-10242-z

Otieno, K., & Owiti, N. (2022, December 9). *Spread false info online at your own peril, bloggers warned*. People Daily - Kenya latest news, business and politics. https://peopledaily.digital/news/spread-false-info-online-at-your-own-peril-bloggers-warned?utm_source=chatgpt.com

Shen, X., Liu, Q., & Zhang, H. (2023). ICT development and youth engagement in digital culture. *Information Systems Frontiers*, *25*(3), 621–637.

Shirish, A., Srivastava, S. C., & Chandra, S. (2021). Impact of mobile connectivity and freedom on fake news propensity during the COVID-19 pandemic: a cross-country empirical examination. *European Journal of Information Systems*, *30*(3), 322-341. https://doi.org/10.1080/0960085X.2021.1886614

Susmann, T., & Wegener, F. (2022). Correcting misinformation and audience resistance. *Journal of Experimental Social Psychology, 98*(2), 104–119.

Talwar, S. (2020). The negative impact of fake news on social media users. *Computers in Human Behavior, 102,* 138–147.

Tandoc, E. C., Lim, Z. W., & Ling, R. (2017). Defining "fake news." *Digital Journalism, 6*(2), 137–153. https://doi.org/10.1080/21670811.2017.1360143

Vogels, E. A., Gelles-Watnick, R., & Massarat, N. (2025, April 30). *Teens, social media and technology 2022*. Pew Research Center. https://www.pewresearch.org/internet/2022/08/10/teens-social-media-and-technology-2022/

Wang, X., Zhang, M., Fan, W., & Zhao, K. (2022). Understanding the spread of COVID-19 misinformation on social media: The effects of topics and a political leader's nudge. *Journal of the Association for Information Science and Technology*, *73*(5), 726-737. https://doi.org/10.1002/asi.24576

Yao, M., & Ngai, E. (2022). Fake news, misinformation, and disinformation in the digital era. *Computers in Human Behavior, 133,* 107289.

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Yin, L. (2023). The changing landscape of media communication: An analysis of the impact of new media marketing on news consumption and consumer behavior. *International Journal of Education and Humanities*, *11*(3), 9-12. https://doi.org/10.54097/ijeh.v11i3.14436

Zikargae, M. H., & Gessese, N. B. (2025). Navigating the influencing of Africa media ethical dilemmas in the Digital Age. *Ethiopian Journal of Language, Culture and Communication*, *10*(1), 252-275. https://doi.org/10.20372/ejlcc.v10i1.2606

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Analysis of growth constraints for small and medium enterprises in Rwanda's emerging economy: A case of Musanze District

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ABSTRACT

Small and Medium Enterprises (SMEs) are the foundation of economic development since they create jobs and significantly boost the economy. However, many of them face significant obstacles in the development processes worldwide. This study analyzed the key constraints hindering the growth of SMEs in Musanze District within the context of Rwanda's emerging economy. This study was grounded on Resource-Based View (RBV) Theory developed by Birger Wernerfelt in 1984, which posits that the performance or growth of any company, organization, or firm largely depends on its effective use of resources. The study used a descriptive survey, and the sample size was 91 respondents selected randomly from SMEs operating in Musanze District. Data were collected using a questionnaire and were analyzed using SPSS software, and descriptive statistics was the tool used. The data were analyzed and interpreted in order to make a conclusion and answer the research questions. The findings reveal that many SMEs lack sufficient collateral to secure a bank loan, as indicated by the mean value of 4.18. Secondly, SME operators mentioned that there are high interest rates in banks. This scored the mean value of 4.26, while they also face regulatory challenges significantly affecting business operations, as indicated by the mean value of 3.89. Moreover, inadequate infrastructure was also highlighted, as indicated by the mean value of 3.75. Additionally, the respondents claimed that there is a lack of training in business management. This scored the mean value 4.10, while high taxes scored the mean value 3.84. Concerning the effect of SME constraints on their growth in Musanze District, respondents claimed that there is limited business growth due to lack of capital, as indicated by the mean value of 3.94, and that many SMEs fail to attract and retain customers due to recurring challenges. This scored the mean value of 4.55. Due to several constraints, many SMEs in Musanze District face high transaction costs and are unable to overcome competition, and this scored the mean value of 4.55. Even though the government of Rwanda has managed to address some of SMEs' growth constraints through targeted financial support, capacity-building programs, infrastructure investment, and policy reforms, several constraints persist among SMEs in Musanze to fully realize their growth potential and contribute more significantly to the district's and the nation's socio-economic transformation. Based on the findings, recommendations were formulated for the government of Rwanda to enhance access to finance and establish SME-friendly financial products by collaborating with banks and microfinance institutions to design loan packages with lower interest rates, flexible collateral requirements, and longer repayment periods.

Keywords: Constraints, Emerging Economy, Growth, Musanze District, Rwanda, Small and Medium Enterprises

I. INTRODUCTION

Small and Medium Enterprises (SMEs) are the foundation of economic development since they create jobs, distribute income fairly, and significantly boost the economy as a whole (Abdullahi & Kabir, 2016). It is commonly acknowledged that the significance of small and medium-sized businesses in developing nations stems from their distinctive features, which include their vast numbers, distribution across rural areas, and consequently, their particular local significance for the rural economy (Boohene, 2022). In developing nations, SMEs primarily engage in agricultural operations and are labor-intensive. These businesses, particularly small enterprises, are mostly financed by the owners' own savings, which are augmented by gifts or loans from family members, local unofficial lenders, traders, input suppliers, and upfront payments from customers.

Likewise, the operations of SMEs contribute to greater employment, export growth, and poverty reduction in both developed and developing nations. Evidence from around the world about SME operations demonstrates that without healthy SMEs, competitive economic systems cannot flourish (Bowen et al., 2009). SMEs in the developing world, however, are unquestionably distinct from those in the industrialized world. The former contribute little to productivity but are very competitive in creating jobs (Chiang & Yan, 2019). SMEs in developing nations, such as those in East African countries, are far less productive than large enterprises. With reference to the study by Abdullahi and Kabir (2016), SMEs typically have trouble accessing funding and gaining access to advanced technologies, accompanied by poor managerial skills.

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In a study by Lutaaya (2018), which looked at how SMEs handled the effects of several limitations on the leather and furniture industries in Sri Lanka and Tanzania between 2010 and 2020, the findings also indicate that practically all SMEs in both nations confront a barrier to financing, and that when they were successful in securing outside funding, they had challenging relationships with lenders. Furthermore, in Sri Lanka, the regulatory burden increased as firm size increased, while in Tanzania, tax and regulatory restrictions also impede the expansion of the smallest businesses. The study by Nguyen (2021), which looked at lending practices in general and the barriers and motivators of bank funding for SMEs globally, also reported on these growth limits for SMEs.

Besides financial obstacles, regulations also contribute to the loss of opportunities for SMEs (Duarte et al., 2017). Significant obstacles to SMEs' expansion include bureaucratic problems, excessively complicated tax structures, restricted loan availability, and compliance challenges. Moreover, the habit of interpreting rules and regulations as informal makes their execution even more challenging, leading to environmental instability and constant uncertainty (Gardner, 2019). According to Boohene (2022), this issue also explains the region's poor anti-poverty efforts, limited job creation, SMEs' incapacity to perform at their peak, and insufficient assistance for the region's economic growth process.

The same growth constraints of SMEs were also examined by several researchers (Niyonsaba, 2022; Rwigema, 2020). Challenges that affect SMEs in this country consist of lack of access to finance. SMEs in Rwanda struggle with accessing finance due to high collateral and documentation requirements, lengthy procedures, and risk aversion from financial institutions (Rwigema, 2020). Furthermore, Niyonsaba (2022) noted that because Rwanda is a landlocked nation, its transportation costs are expensive, making them a significant barrier. However, there are no documented studies conducted in Musanze District which highlight the extent to which SMEs are affected by such growth constraints. Therefore, this research provides insight into the constraints faced by SMEs and offers recommendations that may contribute to the growth and sustainability of SMEs in Rwanda.

1.1 Statement of the Problem

For all the country's initiatives to accelerate economic development and growth potentials, especially by developing financial inclusion and improving the ease of doing business, SMEs still face financial challenges, which perpetuate the high level of unemployment in Rwanda. Based on data issued by the National Institute of Statistics in Rwanda (NISR, 2023), Rwanda's SMEs account for 98 percent of all businesses, employ over 2.5 million people, and contribute around 33 percent to the country's Gross Domestic Product.

It has been challenging to take advantage of the current potential to speed up the growth of SMEs, though, because this potential has been supported with little impact. Even though the government has put in place programs to encourage self-employment and increase entrepreneurial motivation, SMEs still receive insufficient assistance from the government and financial lending organizations.

Likewise, the lending terms elaborated by financial institutions are not favorable to the SME sector in Rwanda. The criteria used to lend to SMEs are still the same as those for large companies (Gardner, 2019). This situation has caused an unending outcry from small firms to the government and lending institutions to soften lending terms for SMEs. SMEs are facing major financial constraints, which have led some to collapse, others to sell off their assets, some to be acquired by other firms, whereas only a few have grown into large companies (Nguyen, 2021). The financial challenges faced by SMEs in Rwanda include an inadequate capital base to meet the collateral requirements necessary to access financing. Where capital is provided, it is considered inadequate compared to the amount needed for the business or project (Rwamigabo, 2019).

Apart from financial constraints, many SMEs in Musanze District experience a low level of human resource development, lack of financial capital, and poor financial management skills, among other challenges (Gardner, 2019). Based on the above documented constraints to SME growth in Rwanda, this study was conducted in Musanze District to examine the key issues facing the growth of small and medium enterprises, and recommendations were formulated for the responsible institutions in order to alleviate SME growth constraints in Rwanda.

1.2 Research Objectives

i. To determine the types of SMEs constraints in Musanze District
ii. To examine the implications of SMEs constraints to their growth in Musanze District

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is grounded on one major theory in entrepreneurship and economics which clearly explains the constraints facing Small and Medium Enterprises (SMEs) in Rwanda's emerging economy. The key theory in this study is the Resource-Based View (RBV) Theory, developed by Birger Wernerfelt in 1984. This theory posits that the performance or growth of any company, organization, or firm largely depends on its effective use of resources

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(Nguyen, 2021). The way they acquire, control, and manage different types of resources is the major determinant of their success. From this perspective, valuable resources provide significant opportunities for striving for organizational success and enable firms to streamline operations, gain competitive advantages, and achieve sustainability (Dushimimana, 2020).

With reference to small and medium enterprises in Musanze District, many SMEs are hampered in their growth due to their inability to acquire and utilize resources. Access to finance is still a significant challenge due to strict lending requirements in many banks and micro-lending institutions. Besides financial capital, many SMEs face the constraints of lacking skilled human capital, infrastructure deficits, and management skills to effectively manage their available resources. This lack of different types of resources, whether tangible or intangible, constitutes the major growth constraints for SMEs in Musanze District.

2.2. Empirical review

In a study by Abdullahi and Kabir (2016), the difficulties faced by Small & Medium Enterprises (SMEs) in obtaining credit in Ghana when trying to secure bank credit from financial institutions were examined. To achieve their objectives, the researchers adopted a quantitative approach. A convenience sample was used to select 80 SMEs in the cities of Accra and Tema, and they were then provided with questionnaires. The responses to these questionnaires led to several important findings. SMEs could receive financial resources from banks and non-bank financial institutions, but these resources would not be sufficient to meet their needs. The most crucial of these needs is collateral, which the majority of SMEs cannot provide. Furthermore, the limited equity base of these SMEs is another significant issue.

Second, in a study by Boohene (2022) examining the effects of innovativeness and firm resources on the growth of small enterprises in the Ga South Municipality in Ghana, it was found that high interest rates and short repayment terms make it very difficult for those who are able to obtain credit to begin any expansion or development projects. Another interesting explanation for the high rate of debt repayment defaults is the SMEs' tight cash flow conditions, which are mostly brought on by difficulties in managing account receivables. The challenges faced by small and medium-sized enterprises were found to contribute to stagnation, leading to a rise in the unemployment rate (Boohene, 2022).

Rwamigabo (2019) also examined the challenges and opportunities of micro or small social enterprises in Rwanda. His findings demonstrated that the rigorous collateral security demands of financial institutions make it impossible for SMEs to obtain loans. He also revealed that the difficulties SMEs face when trying to obtain financing from banking institutions are severe, and he recommends that the government should play its role in enabling SMEs to obtain finance from financial institutions to support their development (Rwamigabo, 2019).

Niyonsaba (2022) analyzed the growth of youth-owned micro and small enterprises in Kigali City, Rwanda, also examining the role of government entrepreneurial interventions. The primary conclusion showed that the biggest obstacle to launching, operating, and growing a business is a lack of funding. In particular, the biggest obstacle facing the SMEs consulted is getting financing, which affects their ability to survive.

Moreover, a study by Lutaaya (2018) examined the challenges for small and medium enterprises' development in Nyarugenge District. The findings demonstrated that the main financial obstacles facing SMEs were a lack of funding and inadequate credit availability, high interest rates, and certain new laws and regulations. As a result, these difficulties have an impact on SMEs' operations in terms of growth (performance), profits, and innovation.

III. METHODOLOGY

3.1. Research Design

This study employed a descriptive survey design that combined qualitative and quantitative approaches. It focused on examining the population by choosing samples for analysis and studying the phenomena. The benefit of the survey was its ability to gather data for statistical analysis in a cost-effective manner (Creswell & Creswell, 2018). This research design was used because it was the best option for in-depth studies that take into account factors such as design economy, quick data collection, and the capacity to examine the population from a subset of it.

3.2 Target Population

Kothari (2004) defined a population as a set of cases from which a sample is drawn and to which a researcher wants to generalize. He further explains that population data is information about all or nearly all of the cases that a researcher wants to generalize. All SMEs in Musanze District and the local government representatives in charge of SME management and development comprise the population to be covered in this study about SMEs' growth constraints and how they affect their potential for growth in Rwanda. In this study, the target population consists of 2,162 SMEs in Musanze District.

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3.3 Sample Size

Saunders et al. (2019) defined a sample as a carefully chosen subset of the target population intended to represent it. Yin (2018) asserts that the sample size should be ideal—neither too large nor too small—with a suitable sample being one that satisfies the requirements of efficiency, representativeness, adaptability, and reliability. In this study, the target population was 2,162 SMEs that operate in Musanze District. The sample consisted of 91 respondents, determined by using the formula of Alain Bouchard. The sample size was selected using both purposive sampling and simple random sampling techniques. A representative sample was chosen from SMEs using random selection, where every enterprise had an equal chance of being selected in Musanze District. On the other hand, purposive sampling was used to select representative individuals, such as SME owners or managers, to provide detailed information about SMEs' growth constraints in Musanze District.

3.4. Data Collection Instruments

Questionnaires and interviews were among the data collection methods employed. According to Bryman and Bell (2015), a questionnaire is a method or research tool that consists of a set of inquiries intended to collect data from respondents. Given that the primary focus of the research is the target population's views, opinions, feelings, and attitudes, questionnaires and interviewing techniques were the most effective ways to gather this data. Questionnaires were used because the research sought to examine factors that are not directly observable, such as people's attitudes, beliefs, opinions, and perceptions about a given issue. In every instance, open-ended questions were chosen because they allow respondents to share their opinions and thoughts on the subject at hand without limiting them to a predetermined range of responses (Kothari, 2004).

3.5. Data Analysis

In this study, both quantitative and qualitative data were employed. Editing and coding of the quantitative data were performed, and the data were analyzed using the Statistical Package for Social Sciences (SPSS) with the aid of descriptive statistics. The averages and standard deviations for the variables under investigation were calculated using descriptive statistics in order to assess the distribution of responses regarding SMEs' growth constraints.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The results of this study, which involved SMEs operating in Musanze District, were analyzed and interpreted in this chapter. Data were gathered from 91 randomly chosen SME managers and operators in Musanze District. Both quantitative and qualitative methods were used to present and analyze the results in order to make sense of the data gathered and reach reliable, fact-based conclusions. Descriptive statistics, such as tables displaying frequencies, percentages, means, and standard deviations, were used to present and discuss the results.

4.1.1 Types of SMEs constraints in Musanze District

The study examined the types of constraints affecting SMEs in Musanze District. The detailed results are presented in the table below.

Table 1

Respondents' Views on Types of SMEs constraints in Musanze District

Descriptive Statistics					
Types of constraints	N	Min	Max	Mean	Std. Dev.
Lack of sufficient collateral to secure a bank loan	91	2.00	5.00	4.18	0.232
High interest rates in banks	91	2.00	5.00	4.26	0.370
Regulatory challenges significantly affecting business operations	91	1.00	5.00	3.89	0.585
Inadequate infrastructure	91	1.00	5.00	3.75	0.838
High transport costs	91	2.00	5.00	4.29	0.421
Lack of market opportunities	91	2.00	5.00	3.84	0.781
Lack of training in business management.	91	3.00	5.00	4.10	0.653
High taxes and fees for SMEs	91	1.00	5.00	3.84	0.857
Insufficient government support for small businesses	91	2.00	5.00	3.91	0.629
Poor infrastructure required	91	2.00	5.00	4.41	0.561
Unfair and overwhelming competition from larger businesses	91	2.00	5.00	4.35	0.373

The types of constraints hindering the growth of SMEs in Musanze District are detailed in Table 1. According to the survey findings, respondents confirmed that they do not have enough collateral to obtain a bank loan. This resulted in a mean score of 4.18, which is nearly at the maximum (5), and a standard deviation of 0.232, indicating

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very little variation in the responses. Concerning the second statement in Table 1, which examined respondents' views on whether banks charge high interest rates, respondents were in agreement, as indicated by the mean score of 4.26—this falls in the "strongly agree" position on the scale used in data collection. Furthermore, the corresponding standard deviation of 0.370 also reveals slight variability in responses.

With reference to the results in Table 1, respondents agreed with the statement regarding regulatory challenges that significantly affect business operations. This was indicated by a mean value of 3.89, which is above the average of 3. The findings also confirmed the challenge of inadequate infrastructure in Musanze District, including roads, electricity, internet connection, and network, which affects business operations. This item scored a mean value of 3.75, which is also above the average. The results also showed that respondents encounter high transport costs, mainly due to inadequate transport facilities and infrastructure in Musanze District.

While assessing the constraints to SME growth in Musanze District, many respondents reported a lack of market opportunities, depending on the business industry in which they are involved. This was reflected in a mean value of 3.84, which is significant and above the average. Moreover, the standard deviation of 0.781 implies slight variability in responses. The results further indicated that many SME operators lack training in business management, as revealed by the mean value of 4.10, which is close to the maximum (5).

Additionally, the results showed that SME operators are affected by high taxes and fees in Musanze District, as indicated by a mean value of 3.84, which is above the average and in the position of agreement. However, the corresponding standard deviation of 0.857 reveals somewhat more variability in responses. Similar to these findings, Rwigema (2020) observed that high taxes and fees on small and medium-sized enterprises can have significant consequences on their operations and the broader economy. As SMEs typically operate with tight margins, heavy taxation can quickly erode their profitability.

The results in Table 1 also demonstrate that there is insufficient government support for small businesses in Musanze District, as indicated by a mean value of 3.91, which aligns with agreement on the Likert scale used in data collection. In this context, lack of sufficient government support for small businesses is a critical barrier to economic development, especially in emerging economies. Due to this challenge, entrepreneurs lack access to business development services, mentorship, and technical training, and face complex registration, licensing, and compliance procedures with minimal support or guidance.

Additionally, respondents revealed that they face constraints related to poor infrastructure required for smooth business operations. This item scored a mean value of 4.41, placing it in the "strongly agree" position. SMEs struggle with unreliable electricity, poor roads, and lack of internet access, especially in rural areas.

Finally, the results showed that unfair and overwhelming competition from larger businesses continues to affect the growth of SMEs in Musanze District. This was indicated by a mean value of 4.35, which is close to the maximum (5). According to Rwamigabo (2019), unfairly intense competition from larger businesses can significantly hinder the development of SMEs, potentially leading to higher failure rates and reduced economic growth. SMEs often struggle with limited access to capital, resources, and expertise, making it difficult to compete effectively with larger, more established firms.

4.1.2 Effect of SMEs Constraints on their Growth and local government revenue generation in Musanze District

The study examined the effect of the constraints affecting SMEs on their growth and local government revenue generation in Musanze District. The results are presented in the table below.

Table 2

Respondents' Views on the Effect of SMEs Constraints on their Growth and local government revenue generation in Musanze District

Descriptive Statistics					
Effect of SMEs constraints on SMES growth and local government revenue generation in Musanze District	N	Min	Max	Mean	Std. Dev.
Limited business growth due to lack of capital	91	2.00	5.00	3.94	0.616
Failure to attract and retain customers due recurring challenges	91	2.00	5.00	4.55	0.566
Inability to effectively manage business operations and resources	91	2.00	5.00	3.65	0.645
Insolvency issues due to financial stress	91	1.00	5.00	3.61	0.856
High level of compliance risks	91	1.00	5.00	3.86	0.841
High transaction costs due to various constraints	91	2.00	5.00	3.78	0.964
Inability to overcoming competition	91	3.00	5.00	4.55	0.266
Failure to resist to the changing business environment	91	2.00	5.00	4.25	0.645
Low local government revenue generation	91	3.00	5.00	4.43	0.452

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With reference to the results of the survey as reflected in Table 2, respondents indicated that many businesses do not grow due to a lack of capital, as shown by the mean value of 3.94. Secondly, the results also showed that many SMEs in Musanze District fail to attract and retain customers due to recurring challenges. This scored a mean value of 4.22, and the corresponding standard deviation of 0.341 reveals slight variability in responses.

Based on the study findings, the results demonstrate that many SMEs are unable to effectively manage business operations and resources, especially due to a lack of training and adequate expertise in human resource management, technology, marketing, and other key areas. This is indicated by the mean value of 3.65, which is also above the average (3) on the Likert scale. In this context, Niyonsaba (2022) also mentioned that poor financial planning and analysis among many SMEs leads to inefficient resource allocation and difficulty in anticipating future needs. Moreover, many SMEs struggle to find and retain skilled employees, especially in competitive markets, while weak leadership, poor decision-making, and lack of managerial expertise can result in inefficient operations and resource management.

The results in Table 2 also show that respondents admit that SME constraints have led to higher insolvency issues due to financial stress in many SMEs. Many SMEs accumulate bad debts due to recurring challenges, diminishing market opportunities, and reduced operational effectiveness. This is reflected by the mean value of 3.86, which is in a moderately positive position. Similarly, a high level of compliance risks was reported to be one of the effects of growth constraints affecting SMEs in Musanze District, as indicated by the mean value of 3.86 and the corresponding standard deviation of 0.841.

According to the results presented in Table 2, it was also revealed that challenges affecting SME development in Musanze District lead to high transaction costs. This is supported by the mean value of 3.78; however, the corresponding standard deviation of 0.964 reveals significant variation in responses, mainly due to the different industries in which the SMEs operate.

The study results in Table 2 further show that, due to these constraints, many SMEs are unable to overcome competition in Musanze District. This is demonstrated by a high mean value of 4.55, which is close to the maximum (5), and the smallest standard deviation (0.266), indicating minimal variability in responses. In this perspective, SME growth constraints such as limited resources, finance, and market access can significantly impact their ability to compete effectively. These challenges can result in difficulties overcoming competition due to factors like reduced ability to innovate, limited investment in technology and marketing, and struggles in retaining skilled employees (Niyonsaba, 2022).

Moreover, the results showed that SME constraints have negatively affected local government revenue, as indicated by the mean value of 4.43. Finally, the results in Table 2 demonstrated that growth constraints reduce SMEs' ability to adapt to the changing business environment, with a mean value of 4.25 and a corresponding standard deviation of 0.645. These findings are also supported by Lutaaya (2018), who revealed that SME growth constraints leading to failure to adapt to changing business environments include limited access to finance, outdated technology, lack of skilled labor, and insufficient government support. These challenges make it difficult for SMEs to adapt to market shifts, innovate, and compete effectively, ultimately hindering their ability to survive and thrive.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study aimed to analyze the key constraints hindering the growth of Small and Medium Enterprises (SMEs) in Musanze District within the context of Rwanda's emerging economy. The findings revealed that although SMEs are essential in developing communities such as Musanze District—through job creation, income distribution, and socio-economic development—they still face significant challenges that minimize their growth potential and ability to achieve competitive advantages. The major constraints highlighted include a lack of financial capital due to insufficient collateral and rigorous bank requirements, lack of training, unfavorable infrastructure, and high taxes. Furthermore, infrastructural limitations such as poor road networks, unreliable electricity, and limited internet connectivity undermine the ability of SMEs to operate efficiently and compete effectively.

Although there are existing government policies intended to support the growth of SMEs, these policies often lack clarity or consistent implementation at the local level, which creates uncertainty and compliance challenges for small business owners. Overall, in order to foster the development of SMEs in Musanze District, the major challenges that limit their growth need to be addressed. The following section highlights key recommendations that are important for streamlining SME operations and promoting growth in Musanze District.

5.2 Recommendations

At the end of this study, recommendations were formulated based on the findings. These recommendations are directed to the Government of Rwanda and NGOs. The government should establish SME-friendly financial products by collaborating with banks and microfinance institutions to design loan packages with lower interest rates, flexible

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collateral requirements, and longer repayment periods. It should also promote financial literacy programs by equipping entrepreneurs with skills in budgeting, saving, and investment to enable them to make better use of financial resources.

Moreover, the Government of Rwanda and NGOs need to strengthen business management training by offering practical instruction in business planning, marketing, record-keeping, and financial management. Similarly, it is necessary to improve infrastructure by upgrading transport networks and road conditions, especially those connecting SMEs to markets and suppliers. Finally, the Government of Rwanda should promote market access and linkages by facilitating local and regional trade fairs to help SMEs increase the visibility of their products and services to new customers and potential partners.

REFERENCES

Abdullahi, M., & Kabir, S. (2016). Challenges affecting the performance of small and medium scale enterprises (SMEs) in Nigeria. *Journal of Human Capital Development, 9*(5), 21–46.

Boohene, R. (2022). Effects of innovativeness and firm resources on the growth of small enterprises in the Ga South Municipality in Ghana. *Ghana Journal of Development Studies, 5*(2), 45–56. https://doi.org/10.4314/gjds.v16i1.1

Bowen, M., Mureithi, S., & Morara, M. (2009). Management of business challenges among small and micro enterprises in Nairobi, Kenya. *KCA Journal of Business Management, 2*(1), 45–49.

Bryman, A., & Bell, E. (2015). *Business research methods* (4th ed.). Oxford University Press.

Chiang, C., & Yan, H. D. (2019). Entrepreneurship, competitive advantages and the growth of the firm: The case of Taiwan's radio control model corporation-Thunder Tiger. *Journal of Small Business and Entrepreneurship, 24*(4), 513–530.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Duarte, D. F., Gama, M. A. P., & Esperança, P. J. (2017). Collateral-based in SME lending: The role of business collateral and personal collateral in less-developed countries. *Research in International Business and Finance, 39*, 406–422.

Dushimimana, A. M. (2020). Financial resources and performance of youth-led small and medium enterprises in developing countries: Case of Rwanda (PhD thesis). Chhatrapati Shahu Ji Maharaj University.

Gardner, L. M. (2019). Strategies of competitive advantage for small businesses in the service industry (Doctoral dissertation). Walden University.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.

Lutaaya, E. (2018). Challenges for small and medium enterprises' development in Rwanda: A case study of Nyarugenge District (Unpublished master's dissertation). University of Rwanda. http://hdl.handle.net/123456789/1699

Nguyen, P. T. H. (2021). Factors affecting successful business start-up: A case study of small and medium enterprises in Ho Chi Minh City. *Journal of Hunan University Natural Sciences, 8*(10), 45–53.

National Institute of Statistics in Rwanda. (2023). *Integrated Business Enterprise Survey (IBES) 2022 Report*. Kigali: NISR.

Niyonsaba, B. (2022). Growth of youth-owned micro and small enterprises in Kigali City, Rwanda: What is the role of government entrepreneurial interventions? *Journal of Economics and Business, 5*(4), 190–204.

Rwamigabo, E. R. (2019). Challenges and opportunities of micro or small social enterprises in Rwanda. IGI Global Scientific Publishing.

Rwigema, P. C. (2020). Effect of COVID-19 on micro, small and medium enterprises in Rwanda. *The Strategic Journal of Business & Change Management, 7*(4), 111–123.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

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Corporate branding strategies in shaping the identity of Kenya Copyright Board (KECOBO)

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ABSTRACT

Corporate branding is fundamental in shaping the identity and public image of organizations dealing with regulatory institutions like the Kenya Copyright Board (KECOBO). KECOBO is still struggling to create a well-defined identity despite several initiatives as a result of limited knowledge, restricted resources, and the ever-evolving digital copyright environment. This study examined how corporate branding strategies affect the organizational identity of KECOBO. The study aimed at identifying the extent to which marketing initiatives influence the organizational identity of KECOBO, the extent to which brand awareness has an effect on KECOBO's corporate identity, the extent to which public perception influences KECOBO's branding, and finally, the extent to which brand extension strategies affect KECOBO's corporate identity. The study, using organizational identity theory and corporate reputation theory, adopted a descriptive research design to study the internal and external perspectives of branding. The targeted population included the head of communication at KECOBO and 10,000 registered copyright holders like authors, artists, publishers, and performers.By using Yamane's formula, a sample of 385 was taken, out of which one was purposively sampled and the rest were sampled by the stratified random sampling method from the National Rights Registry. Questionnaires and interviews were used to collect qualitative and quantitative data in the study. Reliability was tested. Cronbach's alpha value for all the key constructs was above 0.75, showing high reliability. Expert review and pilot testing confirmed the validity. The similarity test ensured construct validity. The survey results found that KECOBO marketing was effective according to 72.4% of the respondents, while the other 27.6% found it ineffective. Thus, there is a need for more targeted and digitally adaptive strategies. Overall brand awareness was moderate but uneven—13% of respondents said they were not very familiar with KECOBO, indicating communication gaps with emerging stakeholders. KECOBO received a positive rating from the public survey. The respondents showed that they trust KECOBO at 72.1% but do not view it as different from the government at 58.7%. Interestingly, 65% of the respondents supported KECOBO's brand extension initiatives, while only 48.5% of them were aware of KECOBO's brand extension initiative. The findings indicate that although KECOBO's branding has a functional base, more attention must be paid to segmented marketing, experience-driven trust building, and planned brand-extension roll-out. This study also includes recommendations about how to improve clarity, stakeholder engagement, and organizational identity of a brand.

Keywords: Branding, Identity, Kenya Copyright Board (KECOBO), Marketing, Organizational Identity

I. INTRODUCTION

Corporate branding is the key of any organization that helps in creating an identity of organization. In other words, it is the way in which an organization sees itself and how the stakeholders see the organization. Corporate branding is not just about logos, taglines and advertising. It also involves the organizational culture, communication, stakeholders and the way of operations. A strong corporate brand builds trust and loyalty and reinforces the organizational identity as it is driven by the alignment of internal values and external perceptions (Balmer & Greyser, 2006). Brand identity is the part of corporate branding that refers to the set of brand connections that the firm seeks to create or maintain in the eyes of the stakeholders. The above mentioned includes tangible like name and logo and intangible like value, vision, mission etc. A clearly articulated brand identity strengthens stakeholder relationships and assures messaging consistency. According to recent study published in 2021, it has been shown that the brand identity essentially builds relationships of emotional bond that develops with the stakeholders which helps to influence the loyalties and perceptions of the different stakeholders (Nguyen et al., 2021). The sum and substance of the study show how brand identity assists in increasing public trust in organization like public sector organization.

Corporate branding globally signifies organizational identity and ability to cultivate stakeholder trust. Corporate branding has helped Apple and Nike to differentiate their products and services from those of their competitors. Thus, both the American and European markets have a heightened level of corporate branding. Apple is a leading technology brand today because of innovation and seamless experience. Nike is another brand that uses storytelling as a strategy to connect with the consumer in a long-term manner (Kapferer, 2012). According to Zhao et

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al. (2021), more recent empirical work demonstrates that robust branding strategies produce trust from consumers to utilize them for acceptable format and extension in competitive markets and resilience against competitors.

In various African nations, branding is viewed as tool for competitiveness and legitimacy. According to Brand Africa's Most Admired Brands rankings, organizations like MTN and Dangote have earned a reputation by branding in line with consumer interests and regional aspirations (Brand Africa, 2023). According to empirical evidence, the clear and consistent branding of African public institutions strengthens legitimacy and stakeholders' confidence. However, the bureaucratic nature of these institutions often prevents brand differentiation (Cullinan et al., 2021). The problem with aligning institutional branding with stakeholder expectations, is regional in nature.

Branding research in Kenya now extends to both private and public organizations. According to Kuria (2020), corporate branding significantly increased customer loyalty in the banking industry in Kenya by developing trust and brand recognition. Ngumo (2022) stated similar branding strategies in telecommunications, causing more consumer engagement leading to service adoption. Branding plays a crucial role in creating awareness of institutional mandates in the public sector. According to a study, campaigns may make the agency more recognizable, but poor delivery of service and minimal outreach will not allow them to develop trust (Kemboy, 2024). The findings align with KECOBO's efforts to enhance brand visibility. However, this has not resulted in meaningful stakeholder engagement or awareness of KECOBO's mandate. According to the study, corporate branding strategies such as brand awareness, marketing strategies, brand extensions shapes the KECOBO identity and affect its stakeholder engagement. The findings of this study were valuable to the literature on corporate branding and identity. Moreover, the study provided recommendations that could be implemented by KECOBO and other agencies with similar characteristics.

1.1 Statement of the Problem

The Kenya Copyright Board (KECOBO) has pursued the establishment of a strong brand identity which is universally known and seen as impactful to assist in the promotion and protection of copyright and intellectual property rights in Kenya. KECOBO may have engaged in various corporate branding activities but faced considerable challenges in regard to coherent brand identity and stakeholder engagement. With regard to how the branding strategies influenced its image, brand equity, and corporate identity, understanding was not holistic.

Existing scholarship suggests a considerable emphasis on corporate branding in the shaping of institutional reputation and stakeholder perception; however, most studies have focused on the private sector. According to Keller (2013), branding plays an important role in engaging stakeholders. Aaker (2014) shows how brand equity like awareness, loyalty, and perceived quality shapes the identity and long-term positioning of an organization. Despite Kenya's burgeoning corporate sector, limited empirical studies have evaluated the manifestation of corporate branding strategies in public regulators.

There has been little assessment between specific branding elements like marketing programs, brand awareness, public image, brand extension, etc. and branding identity of public institutions. KECOBO, as a regulatory agency operating in a highly on-going dynamic digital environment, sought clarification on how these branding elements were aligned to its corporate or organizational goals and the expectations of its stakeholders. To put it differently, the goal of this study was to close these gaps through a critical examination of KECOBO's corporate branding strategies and their effects on the agency's brand identity. The research looked at public perception, stakeholder awareness of KECOBO, marketing effectiveness, and visibility of brand extensions, with a view to generating results that KECOBO can use to inform its communication and branding practices.

1.2 Research Objectives

i. To analyze the influence of marketing initiatives on KECOBO's corporate identity.
ii. To determine the effect of brand awareness on KECOBO's corporate identity.
iii. To evaluate the impact of public perception on KECOBO's corporate identity.
iv. To assess the role of brand extension strategies in KECOBO's corporate identity.

II. LITERATURE REVIEW

2.1 Theoretical Review

The research analyzed KECOBO's corporate branding and image by examining the internal and external forces using the Organizational Identity Theory and Corporate Reputation Theory. Theories of corporate branding provided a framework for KECOBO to assess how it was creating an identity, how stakeholders perceived it and ultimately, the communication of its mission.

2.1.1 Organizational Identity Theory

The Organizational Identity Theory developed by Albert and Whetten in 1985 suggests that an organization's identity is influenced by internal factors such as values, beliefs, mission, and purpose as well as external factors like

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stakeholder expectations and perceptions. For KECOBO, establishing a strong identity also means ensuring that its values are reflected in internal stakeholders' perceptions of the organization. KECOBO has repeatedly affirmed commitment to intellectual property rights protection and creativity which has entrenched its organizational identity and authenticated its brand extensions. (Bednar et al., 2020).

The idea of identity salience in the theory comprised making specific elements of an organization's identity salient depending on context. For instance, at times of policy change and turmoil in the industry, KECOBO could highlight its importance as protector of Intellectual Property to assure stakeholders of its reliability and stability. Also, KECOBO's internal self-conception and the external public perception must be aligned per the KECOBO theory identity. When an organization's actions matched its stated mission and values, its brand credibility and corporate image would most likely be enhanced (Pratt & Hedden, 2023).

The Corporate Reputation Theory should be added to the Organizational Identity Theory as it adds the external stakeholder view to the internal focus of identity in a corporate branding context. Organizational Identity Theory explains how KECOBO creates and communicates its core values, values statements and a sense of internal self-identity. However, it does not explain how these elements are evaluated and interpreted externally. Corporate Reputation Theory deals with the impact of trust, credibility, and image on an organization and acts as a connector. In the case of KECOBO, a strong internal identity must be matched by a favorable external reputation so that KECOBO's branding strategies will be effective enough to build legitimacy and confidence amongst the stakeholders. As such, the second theory adds value to the framework by linking the processes of identity formulation with perceptions, trust and reputational capital in the public sector.

2.1.2 Corporate Reputation Theory

Created by Charles Fombrun (Barnett et al., 2006), Corporate Reputation Theory explains the contribution of stakeholder perceptions of the organization's conduct, communication and decisions to its reputation. A good reputation improves credibility and trust which contribute to a good corporate image. In other words, in the context of KECOBO, reputation has to do with the success of engagement with its stakeholders, management of its public image, and tensions in the industry (Wæraas & Byrkjeflot, 2012).

One of the main ideas in their theory was the process of forming a reputation. The emphasis was on acting ethically and being consistent. KECOBO desired to comply with the expectations of its stakeholders to establish a reliable and professional image. Reputation management relays on transparent and responsive communication and meaningful engagement (Lock & Jacobs, 2025). KECOBO should proactively address stakeholder issues, manage crises and ensure message consistency to mitigate reputational risks and build a strong corporate image. The theory pointed out the importance of trust as the most important outcome of reputation management. Trust develops over time, through integrity, openness, and consistently delivering on promises. KECOBO's enforcement of copyright laws to enhance the creative economy has increased public confidence in the mandate (Lipare, 2023). Thus, the trust it has created with the stakeholders strengthened its image and the institution's credibility in the public eye.

Both theories noted that an organization's internal identity and its external reputation are related. For the KECOBO, it meant that its values, beliefs and mission should be effectively and consistently communicated to stakeholders. The alignment of identity and reputation was critical in building trust, maintaining stakeholder confidence and reaffirming regulatory legitimacy. The combination of Organizational Identity Theory and Corporate Reputation Theory proved to be effective to analyze KECOBO's brand image, its stakeholders, and its communication. Theoretical insights a better understanding of how organizations in the public sector can leverage branding to manage perceptions, build trust and achieve institutional objectives.

2.2 Empirical Review

Worldwide, studies demonstrate that corporate branding is essential for building strong business identities and reputations. According to a study by Zhao et al. (2021) on the Chinese retail industry, the contributors' branding has an impact on trust and recall in that it causes consumers to become aware of a product, creates loyalty towards it and manages the perception of quality. Zhang et al. (2024) confirmed that corporate branding in Chinese corporations enhances perceived quality as well as trust to boost consumer confidence. A study by Dwivedi et al. (2020) revealed that the emotional connection consumers feel towards corporate brands due to social media branding fosters loyalty and an ongoing relationship with the brand. Furthermore, Beig and Nika (2019) show that brand communication also has a favorable influence on both brand experience and brand equity. That is to say, brand communication is essential for strengthening identity in a global marketplace. All in all, the studies mentioned above signify that corporate branding is not merely visibility but more about building emotional and reputational equity to help better performance across a range of different contexts.

Branding in Africa has been related to legitimacy, confidence and competitiveness. A study conducted by Otokiti et al. (2022) among SMEs in Nigeria proved that branding provided a significant contribution to customer retention and business resilience especially in turbulent market settings. Adetayo and Omolade (2023) investigated

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branding strategies of Nigerian SMEs and showed that branding strategies directly improved customer loyalty and market visibility. Overall, branding plays a vital role in stabilizing enterprises of emerging economies. In South Africa, Cornelissen (2017) argues that corporate branding in public institutions brings organizational legitimacy. They go on to argue that bureaucratic challenges can undermine the development of unique brand personalities. The findings indicate a regional challenge where public institutions often cannot distinguish themselves from the government identity, which erodes stakeholders' trust and diminishes the potential for a long-term relationship.

Within Kenya, empirical studies on corporate branding are on the rise and provide useful information for public and private. Wakazi and Ogada (2019) studied commercial banks in Voi Town and found that corporate branding enhanced client satisfaction, which in turn strengthens competitiveness in the banking sector. According to research by Langat et al. (2021) that examined mobile banking services, the perceived corporate image mediates the service quality customer retention relationship. Therefore, it points to the importance of branding. Chachah et al. (2024) studied the National Police Service in the public sector and concluded that branding strategies improved alteration in public perception of improved service delivery though the challenges of consistency. Likewise, Muendo et al. (2024) showed that corporate branding in the university influenced student choice. This is an indication of how important branding is in education. Previous Kenyan studies have demonstrated that branding facilitates organizational reforms and stakeholder engagement. In a case study of the Communication Authority of Kenya, Ambiyo (2022) found that corporate social responsibility measures significantly improved brand identity and trust. According to Wangui et al. (2021), internal branding practices such as staff training and leadership alignment positively influence brand performance in small and medium enterprises in Kenya. Branding is needed for trust with stakeholders and credibility of service so that the organization can perform. The Kenyan studies collectively argue that this is what is needed, and yet there are problems with outreach and communication due to bureaucratic inefficiencies.

III. METHODOLOGY

3.1 Study Area

The Kenya Copyright Board offices near the NHIF building on Ngong Road in Nairobi County were the site for the research study. The study also intends to include external stakeholders. A section of the public was involved in the study. The entities included MCSK, artists, producers and managers, and foreign rights holders. Those that took part in the public participation were selected at random and from various areas within Ngong Road. The study included selected artist, author and publisher after confirming their availability for the interview.

3.2 Research Design

A descriptive research design was employed in the study. Descriptive research is relevant as it can explain accurately and systematically a phenomenon. In addition, descriptive research utilizes a wide variety of research methods to study one or more variables (Errida & Lotfi, 2021). Descriptive research gathered qualitative and quantitative data. Descriptive research was helpful for it was a reliable and stable design approach that applies for qualitative and quantitative research. Through the questionnaires and interview, the descriptive research will facilitate the gathering of information that will be helpful in determining the characteristics and trends in the target population as per the need for the research questions.

3.3 Target Population and Sample Size

The rationale for the target population concerned is based on the functions and interactions of the two groups with the Kenya Copyright Board (KECOBO) which are very important in understanding its corporate branding and image. The first group which is the head of communication, KECOBO is of special interest to the study because he is directly responsible for brand building and brand communication. The marketers for KECOBO's image will gain crucial information about the board's branding activities, which circulars are produced and the way it advertises its events, vision and mission to the general public.

This group is important for providing an idea of the internal strategies of the organization, goals and how its corporate branding is at work. The second group is the public sector, which comprises artists, publishers, performers, and author/composer members of KECOBO. They represent customers, who are the users of the national copyright registration database managed by KECOBO. This group is important, as they receive the services of KECOBO, while their perceptions and feedback on the branding of the organization helped determine how the external stakeholders perceive the corporate brand. The overall image and reputation of the Kenya Copyright Board is likely to be shaped by their experiences.

In the multi-stage sampling method employed in this study, purposive sampling and stratified random sampling have been combined. The study employs purposive sampling to sample the head of communication of Kenya Copyright Board (KECOBO). This person is carefully chosen for a significant role in developing and communicating the board's brand and image. Being in a position of power, they are in a favorable position to harvest important

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information about internal branding, communication and overall organizational identity. Alongside this, stratifying the random sampling allows for greater representativeness of external stakeholders, for example – artists, publishers performers, and authors/composers. This method involves the identification of distinct strata in the population for instance, divides the population into distinct strata with respect to relevant demographic or professional characteristics, for example, type of creative work, geographic location, duration of affiliation with KECOBO. The National Rights Database uses random sampling to select participants. The database will provide a comprehensive register of KECOBO stakeholders to ensure all persons stand an equal chance of being selected in the study. This randomness allows for better generalizability of the study by reducing selection bias in the selection process. The desirable sample size was achieved by application of the Yamane sampling formula (1967). This formula offers two coefficients, one a constant P 0.05 and the second a confidence level of 95%. Given below is the formula which indicates how the sample size was arrived at.

$$n = \frac{N}{1+N(e)2}$$

Where:

N=Total population
N= The sample size
ε =error term
N=10000 ε=0.05
N=10000
1+10000(0.05)2
n=10000 =384.61
1+25
N= 384

Table 1

Sample Size

Category	Target Population	Sampling Technique	Sample size
KECOBO Head of Communication	1	Purposeful selection	1
Artists, authors/composers, producers & Publishers	10,000	Random Sampling	384
Total	**10001**		**385**

3.4 Data Analysis

The initial step of data analysis was cleaning the collected data to weed out spoilt, incomplete or unanswered questionnaires to ensure that all the collected information is consistent, complete and reliable. Microsoft Excel was employed due to the tools it offers for data cleaning, analysis and visualization. Through the analysis of the data, extrapolations of the different measurements such as frequency, demographic distribution, level of awareness etc. which helps to derive useful information relating to the topic of research will be done. To summarize the numeric data and to give a quick peek into the analyzed data, tables, graphs and charts were used in the presentation. Statistical techniques infer characteristics of a large group from a smaller group. The relationship between corporate branding constructs (brand extension, marketing strategies, brand equity, organizational reputation) with corporate image was examined using regression analysis. This method data determined the strength and significance of these relationships, which helped to determine how, the independent variables affect the dependent variable.

Figures and tables summarize numeric data and highlight findings for effective presentation. The description and in-depth statistics show the present status and the effect of corporate brand strategies on the image of the organization. As a result, the focus of the investigation is aligned on useful results matching the purpose.

IV. FINDINGS & DISCUSSIONS

4.1 Response Rate

A total of 384 questionnaires were distributed, out of which 362 were returned fully completed. The percentage is greater than the 70% threshold which Fincham (2008) provided as enough to lessen non-response bias. Thus, the data can be considered reliable. The high return rate was enabled by adopting flexible data collection methods such as physical and online questionnaires, coupled with follow-ups via emails, phone calls and KECOBO official communication. These measures widened participation and ensured that KECOBO staff, registered copyright owners, artists, publishers, among others participated timely.

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4.2 Demographic Characteristics of Respondents

An analysis of the demographic characteristics of the 362 respondents was undertaken to provide context to the sample and to assess the sample's fitness to the target population. The demographic variables were sex, age, education level, occupation, and years of association with KECOBO. It is important to note that these attributes would determine how one perceives, experience and attitude towards corporate branding in the organization.

4.2.1 Age Distribution

The study sought to examine the age distribution of the respondents. Table 2 presents the findings obtained.

Table 2

Age

Age Bracket	Frequency	Percentage
20–30 years	120	33.1%
31–50 years	170	47.0%
Above 50 years	72	19.9%

The people who filled out the surveys were from many ages, from 20 years to over 60 years. Most (47%) cherished Persons of the Age Group 31-50 years followed by 20-30 years (33%) and above 50 (-20%). The distribution shows that the research recruited participants from both younger and older generations. Thus, the research could look at the perception of branding across different life stages.

4.2.2 Gender

Furthermore, the gender of the study respondents was examined. The findings were presented in Table 3.

Table 3

Gender

Gender	Frequency	Percentage
Male	208	57.5%
Female	154	42.5%

The sample consisted of male and female respondents, with males at 57% and females at 42%. The near balance of male to female respondents means that the results are less likely to have been biased by either gender. KECOBO's brand strategies findings assure broad stakeholder perspective because they include responses from both male and female respondents. This suggests that the research gathered perspectives from a wide range of people.

4.2.3 Duration of Engagement with KECOBO

The study also sought to examine the duration of respondents engage with KECOBO. Table 4 presents the findings obtained.

Table 4

Duration of Engagement with KECOBO

Duration	Frequency	Percentage
Less than 2 years	112	31%
2–5 years	160	44%
Over 5 years	90	25%

To assess the respondents' familiarity with KECOBO's operations, services and branding activities, duration of engagement was measured. Almost half of the stakeholders (44%) interacted with KECOBO for between two and five years. This indicates that most respondents had sufficient experience with KECOBO to observe the change in branding, judge the consistency of communication and make subjective assessments regarding the corporate image of KECOBO. An additional 31 percent said that they have been involved for less than two years. This group is still relatively new, but it does give some early indication of how first-time and recent entrants perceive the identity of KECOBO and the effectiveness of its efforts to introduce itself to new stakeholders. Finally, 25% of respondents said they have been engaged for over 5 years, which means they are seasoned stakeholders who have witnessed several shifts. The long-term perspectives are important when evaluating whether KECOBO was consistent with its identity, improved its brand favorability, and adapted to changing industry requirements. Responses indicate that most stakeholders have worked with KECOBO long enough to provide relevant feedback. The presence of some newer

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stakeholders, grouped with long-standing members, strengthens our overall understanding of KECOBO's branding effectiveness over time.

4.3 Influence of Marketing Initiatives on Corporate Identity

To examine the extent to which promotional activities of KECOBO influence its image, the respondents were asked to rate the effectiveness of the organization's marketing initiatives such as advertisements, social media use and awareness campaigns in this regard.

Table 5

Influence of Marketing Initiatives on Corporate Identity

Rating	Frequency	Percentage
Very Effective	102	28.2%
Somewhat Effective	160	44.2%
Neutral	60	16.6%
Not Effective	40	11.0%

As seen in Table 5, the majority of the respondents perceived the marketing initiatives of KECOBO as very effective or somewhat effective. Indicates that KECOBO's branding activities enhance its corporate identity by increasing visibility and reinforcing recognition among various stakeholders. Nonetheless, 16.6% of the respondents stayed neutral which may be due to uncertainty whether these initiatives can enhance the corporate image.

Furthermore, 11% indicated that the initiatives are ineffective. This suggests that some stakeholders perceive that KECOBO's marketing initiatives are unhelpful. Thus, the KECOBO marketing efforts are consistently effective but not very effective. In addition, KECOBO still has room for improvement in expanding outreach and creating a stronger sustained impact on its identity. This suggests that intentional and careful marketing approaches are not only communication tools, but also important mechanisms for the formation of identities. The findings support Wakazi and Ogada (2019) study in Voi town, which show that strong corporate branding and targeted marketing enabled organizations to maintain stakeholder trust in the financial sector.

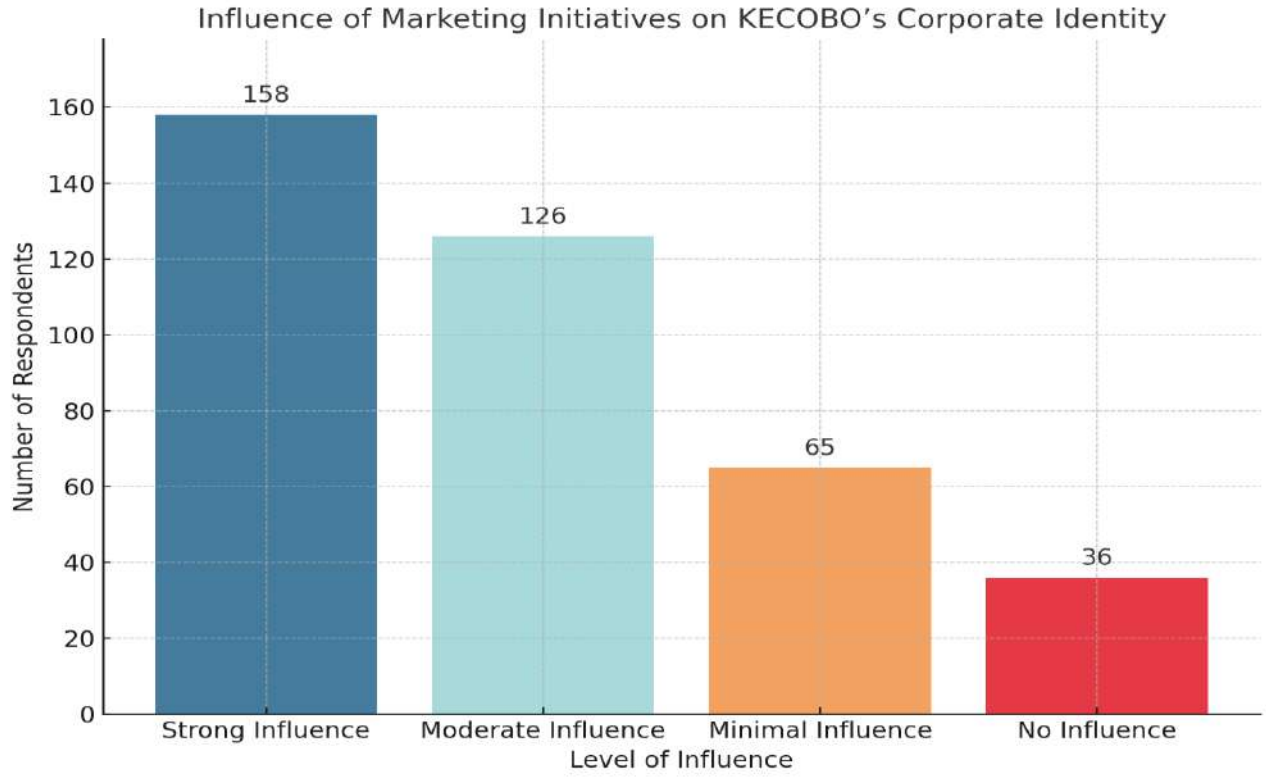

Figure 1

Influence of KECOBO's Marketing Initiatives

Figure 1 shows that the majority of stakeholders believe KECOBO's marketing initiatives have positively influenced its corporate identity through advertisement, social media activity, and awareness campaigns. A large fraction of respondents believed that the efforts were effective to a strong or moderate degree, implying that they help to build brand awareness and brand trust. On the other hand, many did not find the impact to be large among them many are not affected maybe it is due to inappropriate message, message not targeted at them, problems with message

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content or an inappropriate issue to raise. The findings imply that KECOBO's marketing strategy helps shape the agency's identity, but some stakeholders do not seem to have been reached or are unconvinced.

The analysis of the interview results also indicated that surveys of both KECOBO and marketing strategies are moderately effective. They can however work on improvement in digital proportion. The interview with the Head of Communication, for example, said that "*We have been consistent with campaigns on radio, TV and print; but the truth is our social media strategy is not as robust as it should be*" (Interviewee, 2025). According to an interviewee, many of our younger stakeholders live in a digital world. Unless we meet them there, our corporate identity will always feel incomplete. This observation supports the evidence that KECOBO has achieved visibility but must diversify their communication channels to ensure that audiences choose interactive digital-first strategies to address the brand. The study by Zhang et al. (2024) determined that ethical marketing operations supported corporate trust and identity in China. The global insights can be seen in the KECOBO case. It shows that marketing initiatives are at the heart of credibility building. Even in a regulatory environment, such initiatives are useful.

4.4 Brand Awareness and Stakeholder Engagement

To find out the level of establishment of KECOBO's corporate brand amongst her stakeholders, respondents were asked to indicate their level of awareness of the organization's brand identity and visibility.

Table 6

Brand Awareness and Stakeholder Engagement

Level of Awareness	Frequency	Percentage
High Awareness	145	40.0%
Moderate Awareness	170	47.0%
Low or No Awareness	47	13.0%

The responses in Table 6 indicate that most respondents understand KECOBO's Mandate and services to a moderate to high level. A moderate level of engagement is observed among stakeholders who engage with the organization. Yet, a smaller segment reported little or no awareness, pointing to the need to enhance outreach strategies to aim for more uniform brand recognition. This is important because that limited awareness could cause under-use of KECOBO's services and a loss of connection between the organization and certain part of its target audience. The low-awareness grouping may consist of newly registered copyright holders, entrants to the creative industry more generally, and individuals outside of KECOBO's primary communication reach. The results support Ngumo's (2022)'s findings on internal branding practices that stated purpose-driven branding builds stakeholder advocacy.

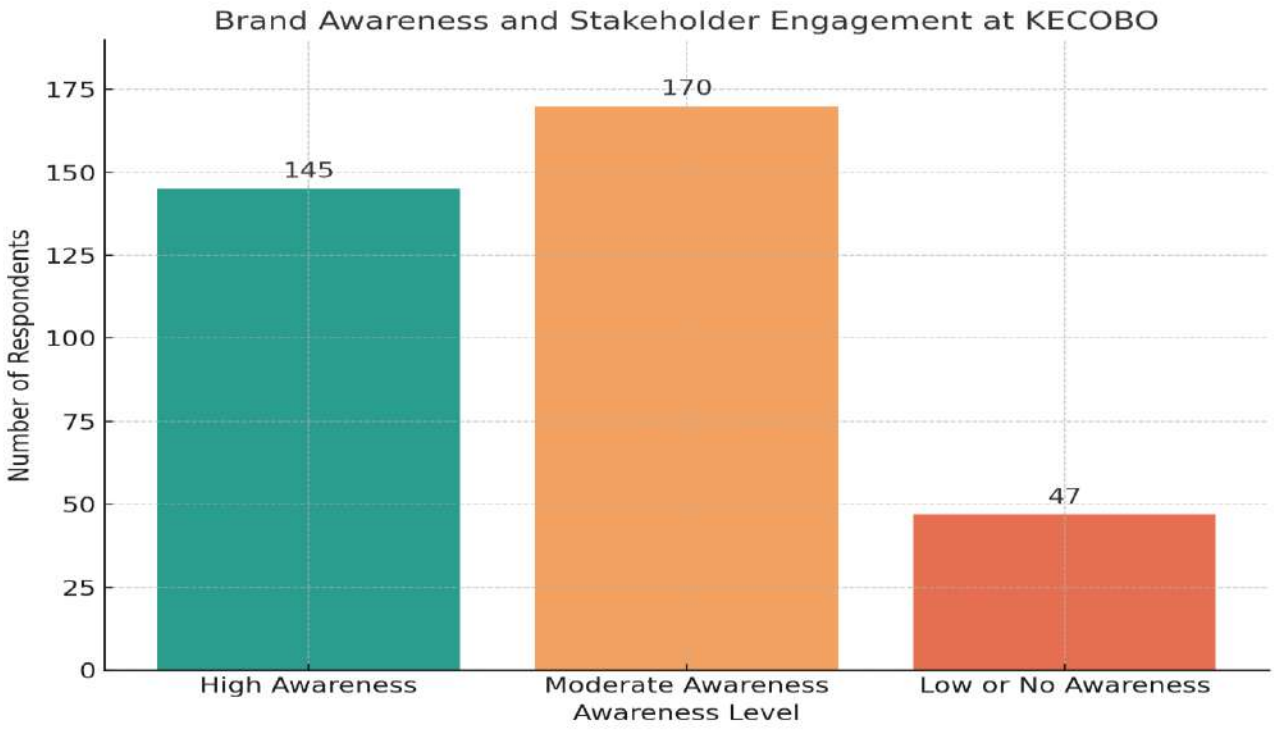

Figure 2

Brand Awareness

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Based on the findings, 145 respondents referred to themselves as being highly aware of the KECOBO which shows strong identification to KECOBO role, services and branding. They may be more engaged, better informed, and more responsive to the organization. The 170 people are said to have moderate awareness. Even though KECOBO's brand has reached them, they may not be aware of the full mandate and operations of the organization. This is an opportunity where KECOBO can intensify engagement through communication and awareness-mobilization campaigns. On the other hand, a total of 47 respondents indicated a low or no awareness of the KECOBO brand. This number is important because it may indicate who we are not reaching. In other words, there are some stakeholders who may not be benefiting from KECOBO's services or advocacy.

The qualitative insights also provide some context to the finding which shows that while there is moderate awareness of KECOBO among the majority, there is a significant minority with low or no awareness. For instance, the Head of Communication told us during the interview: "*There are many artists and rights holders who still do not know about KECOBO, especially those outside Nairobi. Our brand does not reach them fully. This makes it challenging to serve their needs or protect their work effectively*" (interviewee, 2025). It shows that the challenges of awareness are not just being able to recognize; but issues of geography and demographic engagement of stakeholders. Consistent branding reduces reputational risks in the National Police Service (Chachah et al., 2024) and enhances public perception. KECOBO's case mirrors these results. Campaign coherence and purpose are essential for maintaining positive perceptions.

4.5 Public Perception of KECOBO's Identity

To understand the public perception of the identity of KECOBO as perceived by the public, Table 7 indicates the trustworthiness and the perspective on communication by the organization.

Table 7

Public Perception of KECOBO's Identity

Statement	Agree (%)	Neutral (%)	Disagree (%)
KECOBO is trustworthy	72.1	18.3	9.6
KECOBO communicates its mission clearly	63.3	20.0	16.7
KECOBO's brand is distinct among government bodies	58.7	25.4	15.9

The findings suggest that trust is KECOBO's greatest asset as most stakeholders view the organization to be credible and reliable. This is aligned well owing to the legitimacy on confidence of the stakeholders. People generally felt that there was a clear mission communication but neutral and negative reactions suggest that outreach may not reach all groups. Most of KECOBO's respondents felt that its brand was distinct from that of other government agencies. A considerable minority, however, did not share the same sentiment. Overall, the findings indicate a strong public image, but an assessment of the message finds room for clearer specificity.

According to KECOBO Survey, the entity is generally trusted, but its brand is not distinguishable from other government entities. The interview echoed this gap in differentiation. For example, the interview with the Head of Communication stated: "*People often see us as just another government office: slow, bureaucratic, and far away*" (Interviewee, 2025).

The interviewee expresses the desire to change that and show that KECOBO is different, that they are here to work with creatives and not against them. This statement focuses on the creation of a brand personality that is relatable and proactive, enabling KECOBO to become closer to its stakeholders. The findings show that KECOBO is perceived as a trustworthy brand with some effectiveness in communicating its mission. However, the large share of neutral and dissenting opinions (27.9% to 41.3% across the three indicators) suggests a need for increased engagement with audiences, stronger brand differentiation strategies, and consistent articulation of the mission in interactions with all stakeholders.

This finding shows that KECOBO is known but there is low awareness of it by key parties. Zhao et al. (2021) studied Chinese retail markets that exhibited similar trends that marketing strategies and brand positioning made consumers more aware of and trusted these brands. Similarly, in Nigeria, Otokiti et al. (2022) found that a consistent message improves consumers' recall and quality perceptions. According to the KECOBO, the level of awareness is moderate, which suggests that KECOBO has not yet achieved the consistent messaging necessary to enhance awareness. This is similar to the emerging markets' notes.

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4.6 Brand Extension Strategies

To check what stakeholders know about KECOBO's latest programs and initiatives; the respondents were asked about whether they have heard of KECOBO's brand extensions such as digital licensing systems and new service platforms. The findings were presented in Table 8.

Table 8

Brand Extension Awareness

Awareness of Extensions	Frequency	Percentage
Yes	175	48.5%
No	187	51.5%

A total of 175 respondents (48 .5%) become aware of the extensions. Likewise, 187 respondents (51 .75%) indicated that they have no knowledge of those. KECOBO has been introducing new services to enhance its corporate identity and service delivery. More than half the respondents were not aware of these developments. There is a big communication gap between the organization's internal branding and innovation efforts and what the audience knows. The disconnect suggests that even if some initiatives have strategic value, lack of outreach or engagement is preventing them from enhancing the corporate image of KECOBO. Moreover, many people are still not aware of the campaign indicating that brand extension campaign had not been integrated into KECOBO's broader campaign and stakeholder engagement. The public sector organization to act where visibility and trust are uttermost and getting the stakeholders informed about the new service is essential. When people are aware of the brand, it influences the way they perceive the brand extension. Moreover, low visibility restricts the extension's effect on 1) brand equity and 2) corporate image. This finding is consistent with Dwivedi et al. (2020), who found that strong brand identity encourages consumers to accept brand extensions in the United States.

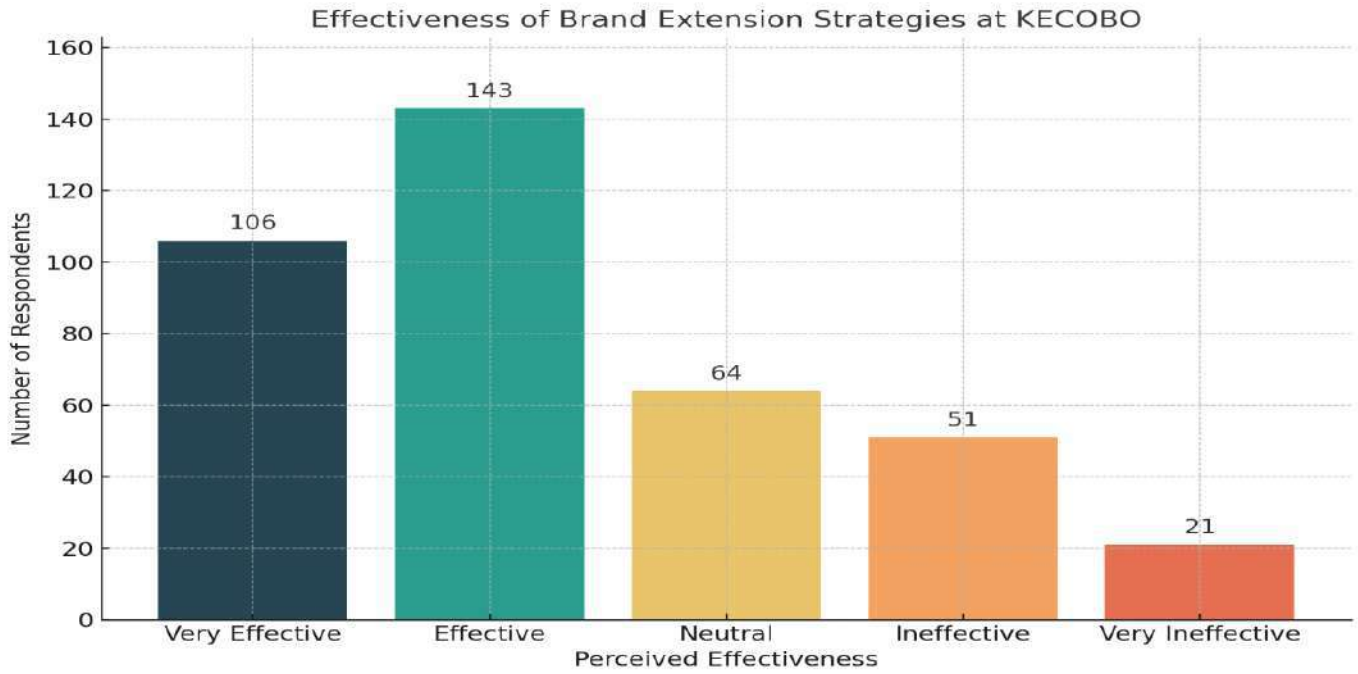

Figure 3

Effectiveness of Brand Extension Strategies

Most stakeholders think KECOBO's brand extensions like a digital licensing system are effective in enhancing KECOBO's identity, findings show. It shows that the organization is confident in its ability to remain credible as it grows. Yet, a sizeable minority of respondents was neutral or negative, indicating poor awareness, communication failures, or incompatible new services with KECOBO's identity. The perception mixed bag highlights that messaging must be clear and engagement strong for all stakeholder groups to grasp the purpose of brand extensions.

Research has shown that respondents are generally favorable to KECOBO brand extensions, but are not aware. The interview clarified this communication gap. The interview with the Head of Communication said: "We have launched new digital services, like online copyright registration, but the uptake has been slow because the

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stakeholders are either not aware of the services or do not know how to use them."*We take responsibility for that. We need to provide clearer explanations and guide individuals through the modifications*" (Interviewee, 2025).

Because they are effectively communicated and align with KECOBO's mission, our survey shows that KECOBO's brand extension innovation is effective. Based on the way responses were distributed, it is clear that most people view brand extensions positively, though a sizeable section of the population does not see much value in it. KECOBO should roll out innovative services, but also strengthen messaging and stakeholder engagement so that their ideas are not lost on the people. In the Chinese retail sector, Zhao et al. (2021) indicated that consumers associate strong corporate brands with higher perceived value resulting in loyalty. KECOBO's experience supports these findings; branding (whether through logo or colors) contributes to brand equity in regulatory bodies.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This research was intended to showcase the contribution of corporate branding strategies to the corporate identity of Kenya Copyright Board (KECOBO). It achieved its objective through successful analysis of four selected constructs; marketing strategies, brand awareness, public perception, and brand extension strategies. These findings give insight into the influence of each of these elements on the organization's identification in the eyes of stakeholders.

The findings pointed out that marketing initiatives matter a lot to the corporate identity of KECOBO especially through outreach programs, visual branding and service marketing. Yet, there were inconsistencies in coverage which may reduce the impact of those efforts. Brand awareness was also crucial in creating an identity, with high levels of awareness showing a strong correlation with favorable perception of KECOBO's mission and functions. However, the information showed that many people from the target population still do not know enough about the services and mandate of KECOBO.

Trust, credibility, and engagement of the users were closely tied to public perception. The image of KECOBO boost its reputation and legitimacy while negative and unclear image damage its identity. The corporate identity of organizations can be strengthened through transparent communication and sustainable engagement of stakeholders, as the finding suggests.

The study additionally showed that brand extension strategies seem to enjoy good support but limited awareness. This disconnect indicates that even strategically aligned innovations may not support identity if they are not suitably articulated and marketed. The low awareness of KECOBO's digital and services extension shows the need to develop a rollout plan that integrates marketing, education, and visibility. The findings show that corporate branding strategies have a direct and significant effect on KECOBO's corporate identity. However, it also shows that these strategies only work if they are consistent. Filling gaps in awareness, perception, and promotional reach will ensure that KECOBO's identity is fully aligned with its mission and resonates with its stakeholders.

5.2 Recommendations

To better engage with their stakeholders, KECOBO should widen the scope and consistency of their marketing efforts. The research shows that while we do marketing activities, there is a limited impact because activities are not consistent and do not cover properly. KECOBO should develop a well-crafted marketing plan and conduct regular campaigns on the radio, television, newspapers, social media, and community-based programs to overcome this. The brand messaging should be backed by a clear brand style guide that ensures messaging, tone, and look and feel remain consistent, regardless of the platform or audience. The brand's visibility can also be enhanced by getting associated with creative industry associations and media houses.

The organization must step up its brand awareness campaigns to fill the gaps in stakeholders' knowledge of its role, services, and accomplishments. The study found that although various stakeholders were unaware of KECOBO due to the branding policy continuous branding policy. One of the strategies that KECOBO could adopt would be to organize targeted engagement activities aimed at improving awareness. They could include activities like intellectual property sensitization workshops, exhibitions at cultural events, roadshows in creative industry hubs and collaboration with schools and universities. In addition, periodic stakeholder surveys will help measure brand recall and facilitate data-driven updates to awareness measures.

KECOBO should focus on enhancing its public perception through transparent, interactive and sustained engagement with its stakeholders. Public perception is shaped not only by marketing messages but also by the organization's openness, credibility, and responsiveness. To build trust, KECOBO can issue press releases, present details in its annual report, and post on social media whenever it enforces a copyright. Stakeholder forums, open days, and live digital Q&A sessions could facilitate dialogue between stakeholders and issuers to enable stakeholders to express their concerns and receive instant feedback. Working with well-known industry influencers and cultural ambassadors can also help reposition KECOBO as a friendly partner to creatives and the creative space.

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The visibility and communication regarding brand extension strategies need to be improved. As the study explains, despite the introduction of fresh services like the digital copyright registration platforms by KECOBO, many stakeholders are quite unaware of it. To enhance the corporate identity of KECOBO through brand extensions, the organization is advised to implement solid promotional initiatives, which may include an explainer video, email campaign, media briefing, and training users. Every extension should demonstrate alignment with KECOBO's mission to mitigate the risk of brand dilution. Stakeholders will be able to understand how the new services contribute to the overall achievements of the firm by doing so.

KECOBO should establish a system for continuous monitoring and evaluation of branding initiatives to continue making progress and to keep up with the needs of stakeholders. Assessing performance necessitates use of indicators such as stakeholder satisfaction rating, brand recognition rate and service uptake. Brands are encouraged to conduct regular audits to measure the progress of building their corporate identity and where improvements must take place. The audits can offer information that can help in determining how to use resources for paying to make effective use of money. Through continuous improvement, KECOBO shall continuously build a strong, relevant and credible brand in tune with the changing landscape of the creative industry in Kenya.

REFERENCES

Aaker, D. A. (2014). *Aaker on branding: 20 principles that drive success*. Morgan James Publishing.

Adetayo, J. O., & Omolade, A. S. (2023). The impact of brand awareness on customer loyalty in selected food and beverage businesses in Lagos State, Nigeria. *Mudima: Journal of Multidisciplinary Studies, 3*(3). https://doi.org/10.55927/mudima.v3i3.3095

Ambiyo, E. (2022). Corporate social responsibility and brand identity of Kenyan corporate firms: Case study of Communication Authority of Kenya (Master's thesis, University of Nairobi). University of Nairobi Digital Repository. https://erepository.uonbi.ac.ke/handle/11295/164681

Balmer, J. M. T., & Greyser, S. A. (2006). Corporate marketing: Integrating corporate identity, corporate branding, corporate communications, corporate image, and corporate reputation. *European Journal of Marketing, 40*(7/8), 730–741. https://doi.org/10.1108/03090560610669964

Barnett, M. L., Jermier, J. M., & Lafferty, B. A. (2006). Corporate reputation: The definitional landscape. *Corporate Reputation Review, 9*(1), 26–38. https://doi.org/10.1057/palgrave.crr.1550012

Bednar, J. S., Galvin, B. M., Ashforth, B. E., & Hafermalz, E. (2020). Putting identification in motion: A dynamic view of organizational identification. *Organization Science, 31*(1), 200–222. https://doi.org/10.1287/orsc.2018.1276

Beig, F. A., & Nika, F. A. (2019). Brand experience and brand equity. *Vision, 23*(4), 410–417.

Brand Africa. (2023). *Brand Africa 100: Africa's best brands 2023 report*. https://www.brandafrica.org/documents/reports/BrandAfrica100-2023.pdf

Chachah, M. W., Munga, J., & Gichunge, E. (2024). Influence of corporate branding strategy on service delivery in the National Police Service in Nairobi County. *International Journal of Research and Innovation in Social Science, 8*(6), 2369–2380. https://ideas.repec.org/a/bcp/journl/v8y2024i6p2369-2380.html

Cornelissen, S. (2017). National meaning-making in complex societies: Political legitimation and branding dynamics in post-apartheid South Africa. *Geopolitics, 22*(3), 525–548. https://doi.org/10.1080/14650045.2017.1278695

Cullinan, J. A., Abratt, R., & Mingione, M. (2021). Challenges of corporate brand building and management in a state owned enterprise. *Journal of Product & Brand Management, 30*(2), 293–305. https://doi.org/10.1108/JPBM-08-2019-2522

Dwivedi, A., Johnson, L. W., Wilkie, D. C., & De Araujo-Gil, L. (2020). Consumer emotional brand attachment with social media brands and their influence on brand loyalty. *Journal of Business Research, 117*(7), 325–336. https://doi.org/10.1108/EJM-09-2016-0511

Errida, A., & Lotfi, B. (2021). The determinants of organizational change management success: Literature review and case study. *International Journal of Engineering Business Management, 13*, 18479790211016273. https://doi.org/10.1177/18479790211016273

Fincham, J. E. (2008). Response rates and responsiveness for surveys, standards, and the journal. *American Journal of Pharmaceutical Education, 72*(2), 43. https://doi.org/10.5688/aj720243

Kapferer, J.-N. (2012). *The new strategic brand management: Advanced insights and strategic thinking* (5th ed.). Kogan Page.

Keller, K. L. (2013). *Strategic brand management: Building, measuring, and managing brand equity* (4th ed.). Pearson.

Kemboy, L. K. (2024). Police use of social media and public trust in Nairobi City County, Kenya (Doctoral dissertation, Kenyatta University).

Licensed Under Creative Commons Attribution (CC BY-NC)

Kuria, J. N. (2020, November). Corporate branding strategies and performance of commercial banks in Kenya [Master's thesis, Kenyatta University]. https://ir-library.ku.ac.ke/server/api/core/bitstreams/ada4d58e-98b8-4b2d-8d8e-407143457405/content

Langat, D. K., Bonuke, R., & Kibet, Y. (2021). Mobile banking service quality and customer retention in the Kenyan banking industry: A moderated mediation model of customer perceived value and perceived corporate image. *SEISENSE Journal of Management*, *4*(4), 47–61. https://doi.org/10.33215/sjom.v4i4.672

Lipare, A. S. (2023). Corporate social responsibility in the digital age: Navigating ethics and reputation management. *International Journal for Multidisciplinary Research*, *5*(6), 1–11. https://doi.org/10.36948/ijfmr.2023.v05i06.9839

Lock, I., & Jacobs, S. (2025). Drivers of reputation and legitimacy of a highly visible public sector organization: Surveying citizens' perceptions. *Corporate Reputation Review*, 1–15. https://doi.org/10.1057/s41299-025-00230-9

Ngumo, E. N. (2022). Influence of digital marketing strategies on the brand equity of mobile network service providers in Kenya (Doctoral dissertation, University of Nairobi).

Nguyen, B., Simkin, L., Canhoto, A. I., & Phan, A. C. (2021). The dark side of digital personalization: An agenda for research and practice. *Journal of Business Research, 122*, 902–915.

Otokiti, B. O., Igwe, A. N., Ewim, C. P., Ibeh, A. I., & Sikhakhane-Nwokediegwu, Z. (2022). A framework for developing resilient business models for Nigerian SMEs in response to economic disruptions. *International Journal of Multidisciplinary Research Growth Evaluation*, *3*(1), 647–659. https://doi.org/10.54660/.IJMRGE.2022.3.1-647-659

Pratt, M. G., & Hedden, L. N. (2023). Accounts and accountability: On organizational purpose, organizational identity, and meaningful work. *Strategy Science*, *8*(2), 182–192. https://doi.org/10.1287/stsc.2023.0189

Wæraas, A., & Byrkjeflot, H. (2012). Public sector organizations and reputation management: Five problems. *International Public Management Journal, 15*(2), 186–206. https://doi.org/10.1080/10967494.2012.702590

Wakazi, A., & Ogada, M. (2019). Influence of corporate branding on client satisfaction in commercial banks in Voi Town, Kenya. *International Journal of Development and Management Review*, *14*(1), 66–75.

Wangui, K. F., Muriithi, S., & Njeru, E. (2021). Effects of internal branding practices on brand performance: A case of small & medium enterprises in Nairobi, Kenya. *International Journal of Social Science and Management Entrepreneurship*, *5*(1), 23–35. https://www.sagepublishers.com/index.php/ijssme/article/view/23

Zhang, D., Zhang, Y., & Lou, S. (2024). What determines consumers' purchasing behavioral intention on social commerce platforms: Introducing consumer credit to TPB. *Environment, Development and Sustainability, 26*(5), 13353–13373. https://doi.org/10.1007/s10668-023-04210-z

Zhao, L., Xu, H., & Chen, Y. (2021). Corporate branding and consumer trust: Evidence from the Chinese retail sector. *Journal of Retailing and Consumer Services, 60*, 102491. https://doi.org/10.1016/j.jretconser.2021.102491

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Effect of tax incentives on economic growth: A case of Rwanda revenue authority in Nyarugenge District, Rwanda

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ABSTRACT

Tax incentives are widely used globally to encourage investment, but their effectiveness in attracting incremental investments is often questionable; tax incentives can present challenges. The general objective of this study was to investigate the effect of tax incentives on economic growth in Rwanda. Specifically, to determine the effect of tax credit incentives on economic growth of Nyarugenge district, to examine the effect of tax deduction incentives on economic growth of Nyarugenge district, and to analyze the effect of tax exemption incentives on economic growth of Nyarugenge district. This study was guided by the agency theory of tax incentives, deduction theory, and tax competition theory. The study used descriptive and correlational research designs. A sample size of 396 respondents was drawn from 38,647 individuals involved in tax incentives and economic growth in the Nyarugenge district. The study utilized the simple random sampling. This study employed the questionnaire and interview guide for data collection. The study used descriptive and inferential statistics for data analysis. The results show that the overall high mean of 3.99 (SD=1.129) for the combined statements reflects a very strong positive perception that there is an effect of tax credit incentives on the economic growth of the Nyarugenge district, the overall high mean score of 3.93 (SD=1.302) for the combined statements reflects an overall strong positive perception that there is an effect of tax deduction incentives on the economic growth of the Nyarugenge district, and the overall very high mean score of 4.04 (SD=1.082) for the combined statements reflects a strong positive perception that there is an effect of tax exemption incentives on the economic growth of the Nyarugenge district. Additionally, the findings reveal that tax credit incentives have a positive coefficient of the estimate, which was significant (β=0.152, p=0.000<0.05). Findings reveal that tax deduction incentives have a positive coefficient of the estimate, which was significant (β=0.109, p=0.000<0.05), and the findings reveal that tax exemption incentives have a positive coefficient of the estimate, which was significant (β=0.657, p=0.000<0.05). The study concludes that tax credits, tax deductions, and tax exemptions contribute to economic growth in Rwanda, focusing specifically on the Nyarugenge district. The study recommends that tax incentive managers should understand the local economic landscape and identify sectors that would benefit most from tax credit incentives; they should create awareness for encouraging investment and entrepreneurship, and the study suggests that tax exemption incentives should be strategically designed to benefit sectors with high growth potential, such as technology, tourism, and agriculture.

Keywords: Economy Growth, Tax Incentives, Tax Credit Incentives, Tax Deductions Incentives, Tax Exemptions Incentives

I. INTRODUCTION

Economic growth according to Sinenko (2024) refers to the growth in the output of goods and services of an economy on a certain interval. And it is mainly measured by the increase of Gross Domestic Product (GDP) which has become a critical indicator of the status of the economy of a country. It is all the more necessary to understand about economic growth, as it gives an idea about the overall performance & health of an economy and this determines employment levels and income rate and living standards. Consequently, economic growth is influenced by a number of factors which interrelate with each other in a complicated nature. Oghogho et al. (2023) and others explain that tax incentives have significant influence on economic growth and stimulate investment as well as consumption. Governments will also be successful in maintaining greater spending and investment in different sectors by reducing the taxes paid by individuals and the business entity.

According to Suwanda (2023), tax incentives play a significant role in economic development since they encourage people to invest and to become entrepreneurs. These incentives persuade companies to invest in new business projects and to expand business operations by relieving the businesses of the financial strains. The steps intended to decrease tax burden on individuals and businesses can be in form of tax credits, deductions and exemptions. Appiah-Kubi et al. (2021) indicated that tax incentives which entail tax credits, deduction, and exemptions are aimed at reducing tax burden on both individuals and businesses. One of the major merits of these incentives is that they result to attracting foreign direct investment; since firms will be more willing to settle in an area with desirable taxation.

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Globally, there are high effects on the growth of the economy on a global scale because of tax incentives which stimulate particular economic activity. As indicated by Dai and Chapman (2022), thoughtful programs were given weight as far as the specificity of incentives being presented by China is concerned. Furthermore, the growth stimulated by tax incentive entailed an increase in budgetary constraints to the governments and it was imperative that balance should be sought between economic stimulation and their fiscal sustainability. According to the authors, tax incentive programs on average attempt to increase the magnitude of research and development, as well as the patenting of new inventions of the firms, which results in the growth of the economy. Malaysia according to Peng et al. (2019) also implement some of the tax incentives that have been put to aid the promotion of green economy.

Besides, Siregar and Patunru (2021) hypothesized that tax incentives have high correlation with economic growth created by foreign direct investment (FDI) in Indonesia. The authors presented the positive and significance of tax incentives on economy growth as a strategic policy of the FDI attraction, thus it can be said that tax incentive policy has the potential in making Indonesia more attractive to foreign investors. This implies that tax incentive may not be the solution, and the economic status of the situation and country specifics are a strong determinant of success of the tax incentive. It proves to be true as was indicated by Serdinova (2023) who has demonstrated the connection that exists between tax incentives and economic growth in Turkey.

In addition, the study points out that there exists great positive correlation between certain tax packages policies corporate income taxes, personal income taxes, Value Added Tax and Gross Domestic Product (GDP) of the country. These tax incentives are the corporate income tax, the personal income tax and the value-added tax incentive, on GDP of a country. It brings to fore the effect of these tax policies in term of encouraging investment and consumption, which in turn stimulates economic activities. This implies that adoption of tax incentives may prove to be a useful intervention mechanism in the drive towards economic growth in Turkey (Oghogho et al., 2023).

In Africa, tax incentives encourage investments from both domestic and foreign sources. In Ghana, they attracted investments to rural areas, thereby stimulating economic activities and contributing to local development. They have encouraged businesses to establish operations in less developed regions (Amankwaah et al., 2022). The effectiveness of tax incentives is not uniform and can differ significantly based on regional and sectoral contexts. This variation suggests that policymakers should consider local economic conditions and industry characteristics when designing and implementing tax incentive programs. Certain areas have experienced more pronounced benefits due to better infrastructure and access to markets, while others have struggled to leverage the incentives effectively. This disparity signifies the importance of tailored approaches to policy implementation that consider local conditions and needs (Suwanda, 2023).

In addition, in Nigeria Olayemi and Folajimi (2021) argued that the tax incentives are considered as a significant source due to the improvement of operational capacity and competitiveness of the SMEs, which has contributed to the growth of the economy of Nigeria. Olayemi and Folajimi reported that tax incentives diminished the expenditure of monies on the part of small businesses by a lot and thus enabled them to plough saved cash back to extensions and innovations. They continued to say that there existed a positive relationship between tax incentives and employment generation in such states. By reducing tax burden, the SMEs stand in a better position to absorb more employees consequently raising the rate of employment and growth of the area. It means that government policy plays a crucial role in easing the process of access to tax incentives (Dai & Chapman, 2022).

Moreover, Charumbira (2024) noted that Botswana has undertaken various initiatives to enhance employment opportunities, particularly by moving away from its reliance on raw diamond mining and export. Author posited that the significant strategy has been the diversification of its economy, these incentives aim to create a more favorable business environment, encouraging foreign companies to establish operations and invest in local manufacturing capabilities. This approach reflects a broader effort to stimulate economic growth and create jobs beyond the traditional diamond industry (Dai & Chapman, 2022).

In Eastern African countries like Kenya, considering the tax incentives indicated by interest rates, inflation rates, and economic growth (Mbogo, 2022). The author noted tax incentives are significant predictor of Foreign direct investment (FDI), adding that tax incentive policies attracted foreign investors. This shows that while tax incentives play a meaningful role, the overall economic environment, characterized by stable interest rates, manageable inflation, and robust economic growth, also significantly affects FDI inflows (Siregar & Patunru, 2021).

Additionally, Ahumuza (2022) develops the argument that in Uganda tax incentives act as one of the major tax policy plans of public finance that determines the realization of both economic and social rights. The tax incentives are designed to spur on financial growth and financial investment and result in better living conditions and access to required solutions. This means that, tax incentives will boost the governmental ability to invest in social programs and thus make rights attainable as it is the case with Appiah-Kubi et al. (2021).

In Rwanda, tax incentives enhance economic growth through investments, strengthening of individual sectors and even creating foreign direct investment (Ukwizagira & Mbereyaho, 2023). Niyonizera and Twesigye (2024), in their turn, assert that tax exemptions focus also on the significance of favorable policies in the attraction and maintenance of businesses, which may contribute to the sustainable growth and the employment of the local population. This is

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substantial in terms of tax reforms in improving the performance of revenue collection at the Rwanda Revenue Authority (RRA). It highlights the need of such reforms in enhancing the efficiency and effectiveness of tax administration. Offering of tax incentives by a community is a strayed policy that is utilized to make sure that business is willing to invest money, grow its operations, and economy.

Bahizi (2016) examined influence of tax laws and incentives on FDI in Rwanda from 2010 to 2015 highlights several critical aspects. However, this research will examine tax credit incentive, tax deductions and tax exemptions. Further, Ndemezo and Ndikubwimana (2020) explored effect tax incentives on productivity of the Rwandan food & beverage processing sector. The study focused on Rwandan food and beverage processing, showing a context gap, but this study will focus on economy growth of Nyarugenge district. Moreover, Niyongabo et al. (2022) assessed the effect of tax incentives on Rwandan foreign direct investment growth. The study concerned on Rwandan foreign direct investment growth, demonstrating showing a context gap, but this study focused on economy growth of Nyarugenge district. Hence, there is needed for more researches in this area. Consequently, the current study seeks to address a gap in the existing literature and study on tax incentives on economy growth in Nyarugenge district has not been studied.

1.1 Statement of the Problem

Tax incentives are widely used globally to encourage investment, but their effectiveness in attracting incremental investments is often questionable, tax incentives can present challenges. In Indonesia, taxpayer incentives have boosted economic growth, but some taxpayers struggle to utilize them due to the complexity of procedures and lack of information about tax incentives. Further, tax incentives are facing acute demographic and environmental problems in Russia (Sinenko, 2024); in Polska, state faced the problems during emergency and martial law (Pravdiuk, 2022).

In Rwanda, report on tax expenditure for the financial year 2024 in Rwanda analyzes companies and establishments that qualify for tax benefits according to the nation's tax and investment regulations. Total tax expenditure increased by 23.6% (Rwf 104.9 billion) compared to 2021/22, representing a total of 29% of tax revenues in FY 2022/23, where VAT, income tax preferences, and customs duties exemptions. The implications of these tax policies on government revenue and economic behavior are explored. Further, tax incentives boost economic growth by promoting investment, enhancing specific sectors, and potentially attracting foreign direct investment (Ukwizagira, 2023). According to Niyonizera and Twesigye (2024) the emphasis of tax incentives highlights the importance of supportive policies in attracting and retaining businesses.

This study uniquely evaluates three specific tax incentives available to business operators: tax credit incentives, tax deduction incentives, and tax exemption incentives. The analysis focuses on economic growth, highlighting its significance not only for Rwandan businesses but also for attracting investment. Previous research indicates that such corporate tax incentives can stimulate investment influx, which in turn fosters job creation and technological advancements. It emphasizes that these incentives enhance the business environment, making it more conducive for investment and development.

1.2 Research objectives

The present study aimed at achieving the following objectives:

i. To evaluate effect of tax credit incentives on economy growth of Nyarugenge district;
ii. To assess effect of tax deductions incentives on economy growth of Nyarugenge district;
iii. To analyze the effect of tax exemptions incentives on economy growth of Nyarugenge district.

1.3 Research Hypotheses

The study tested the following specific hypotheses:

Ho_1: There is no significant effect of tax credit incentives on economy growth of Nyarugenge district;
Ho_2: There is no significant effect of tax deductions incentives on economy growth of Nyarugenge district;
Ho_3 There is no significant effect of tax exemptions incentives on economy growth of Nyarugenge district.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Agency Theory of Tax Incentives

According to Bauer et al. (2018), presented with the approach of Michael C. Jensen and William H. Meckling in the frame of the Agency Theory of Tax Incentives (ATTI), managing the interests of the company managers and the shareholders are critical to the success of tax stimuli. According to this theory incentives in taxation may work well to fill in the gap which currently exists between objectives of the managers who are the agents and that of the shareholders who are the principals. With the tax incentive, businesses can motivate the managers to perform actions that are

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profitable to its shareholders and this will increase the corporate governance of the entire business and hence the performance will also be good.

The agency theory of tax incentives and tax credits examines the connection between the principals and the agents and how this principle can be applied in the taxation environment. It assumes that there is the possibility of aligning the interests of taxpayers (agents) by using tax incentives and credits to align the interests they possess alongside the government (principals). Government can make taxpayers obey by offering advantages in a form of monetary benefits. With this approach, it will promote the targeted behavior among tax payers. According to this theory, tax incentives allow capturing agents and induce their behavior in a beneficial way as it applies to the entire economy (Tekin, & Polat, 2020)

The agency theory that is reviewed by Panda and Leepsa (2017) is the phenomenon that explores relations between principals and agents and specifically the conflicts that can occur when interests of both parties are not harmonious. The theory highlights the complications with maintaining that agents are acting in the best interests of the principals particularly where there is information asymmetry. The dis-alignment may be followed by the opportunistic behavior of the agents but this opportunistic behavior can be reduced with properly structured contracts that lead to the alignment of interests.

The ATTI illustrates the inherent conflict of interest between governments and businesses when tax breaks are offered. In this context, the government functions as the principal, while businesses serve as agents. In addition, the review demonstrates the importance of transparency and communication with regard to establishing trust between the agents and principals. Good communication has the ability to improve the level of understanding and cooperation thus lessening the possibility of conflict and helping to create a more productive relationship. In general, the results indicate that dealing with the problem of agency theory should comprise the combination of contractual alignment and open conversation. According to Bratton (2012), the agency theory on tax incentives made it clear that tax incentive programs are in extreme need of very careful design. It points out that these programs should be designed in a manner that would reduce risks. The end outcome would be to make sure that these incentives achieve their due purpose. The ultimate goal is to ensure that these incentives fulfill their intended objectives effectively.

The agency theory of tax incentives is relevant to this study because it underlines the association between principals and agents, in the event of tax incentives. In addition, the agency theory of tax incentives offers a framework within which to view the manner in which tax policies can be applied strategically in order to affect agent behaviour contributing to a more aligned set of interests and driving improved organizational performance. Also, agency theory of tax incentives assisted the researcher to support the impact of tax credits on the growth of the economy in the district of Nyarugenge.

2.1.2 Deduction Theory

The deduction theory is closely associated with Aristotle, in 1948, an ancient Greek philosopher renowned as the "father of logic." His significant contribution to this field is the development of the syllogism, a structured logical argument consisting of two premises leading to a conclusion that necessarily follows from them. This framework is fundamental to classical deductive reasoning (de Paiva Siqueira, 2017).

According to Givati (2019), its theory is discussed along with the items of tax deductions in terms of measuring the income and efficiency in economics. It states that although tax deductions received an image of a key component to measuring income, the more effective way of thinking challenges them as a necessity. The excellent deduction code suggests that the deduction be pegged to the share of the taxable benefit. This reveals that the exception of this rule can only cause rising deadweight losses, especially when the departures become more significant. Tax deductions can be seen through the lens of this efficiency perspective and it can be used to inform the best possible tax policy. Givati also considers the implications of different rules of deduction that are prescribed in the internal revenue code, analyzing them both in the aspect of income measurement and efficiency, thus improving the pedagogy of the teaching of tax deductions.

Moreover, in his theory of deduction, Popper (2022) argued that deduction is one of the major forms of reasoning that elaborates on the logic structure and logical results based on facts or assumptions. It is requisite in such area as mathematics, philosophy, and computer science. Financial or non-financial tax incentives are important in determining the behaviour and decision-making of taxpayers. It is necessary that organizations understand their dynamics so that they can enhance performance, introduce engagement and produce desired results. The complexities between deduction theory and tax incentives enable the organizations to examine various possible effects of tax incentives and how it would affect behavior.

Moreover, de Paiva Siqueira (2017) deduction theory emphasizes the importance of established premises, which serve as the foundation for drawing inferences. The process is characterized by its structured nature, allowing for clear and systematic reasoning. The effectiveness of this approach lies in its ability to produce conclusions that are necessarily true, provided that the initial premises are accurate. The theory of deduction is meaningful to this study as a logic branch that emphasizes formal principles and methods for determining conclusions from premises. Additionally, theory of

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deduction aided the researcher to underpin the effect of tax deduction incentives on economy growth in Nyarugenge district.

2.1.3 Tax Competition Theory

Zodrow and Mieszkowski, but also the work of Wilson, which took place in 1986, are the primary sources of the tax competition theory. Their paradigm has made substantial progress and has become the most played out model concerning the literature dealing with this topic in the academia. These scholars have defined the knowledge about the nature of tax competition and its effects on the economic policy (Tiutinyk & Mazurenko, 2021).

Gugl and Zodrow (2019) indicate that the theory of tax competition suggests that governments are set to compete over tax bases in their attempts to adjust tax rates. This occurs in different forms; at country, state or provisional levels among others. The theory emphasizes strategic action of governments so as to pursue attracting businesses and people by presenting better tax terms. Consequently, the requirements to be competitively attractive in the globalized economy might affect the tax rates. This means that the theory of tax competition emphasizes that the interaction between the taxation policy and the economic competitiveness is dynamic.

Keen and Konrad (2013) note that a deep research concerning the theory of tax competition and coordination is carried out because the growth of the theory has taken place extensively in the last 30 years. They paid special attention to taxation of capital income regarding the implication of productive capital movement and paper profit. With a shared setting of indiscriminate tax competition being a common structure, the welfare properties and comparative statics of non-cooperative equilibria under investigation are put through the test on the basis of two models. Its findings are effective to illustrate the noteworthy principle that is tax competition is a large area of worry filtered by several anxieties particularly on taxation of capital income.

Tiutinyk and Mazurenko (2021) applied the Theory of Tax Competition to study the key aspects of country-competition at attracting investment with the help of using taxation policies taking into account the role of the attractiveness of tax regimes and tax rates on cross-nation capital flows. Through globalization, tax policy has been affected and greater mobility of the capital has compelled countries to re-examine their systems.

This qualifies the fact that tax competition fosters economic growth, it also has the effects of lessening the amount of public investment and causes disparity. With the aim of antagonizing the negative impacts of tax competition, the theory of tax competition insists on cooperation in order to overcome its negative impacts and promote fair taxation practices in an economically competitive way (Woodgate, 2020).

The theory of tax competition is important to this study as it seeks to maximize profits and governments aim to enhance the utility of a representative agent. These models demonstrate that tax competition leads to tax rates or exemptions being driven to inefficiently low levels, which may have adverse implications for public finance and overall economic stability. Additionally, theory of tax competition helped the researcher to underpin effect of tax exemptions incentives on economy growth of Nyarugenge district.

2.2 Empirical Review

2.2.1 Tax Credit Incentives on Economy Growth

Nam and Kwon (2024) have undertaken a study of Child Tax Credit (CTC) expansion, or American Rescue Plan Act, to offer family relief in a form of financial benefit provision to families with children in a time of COVID-19 pandemic. Specifically, the study analyzed the linkage between the CTC expansion and mental health outcomes, depression and anxiety symptoms of low-income parents. The study used data on the Household pulse survey and was accompanied by the difference in difference in difference estimator with propensity score matching to find the effect of the expanded CTC on low-income households below $35,000. The results indicated that families having access to the expanded CTC benefits had very low chances of developing anxiety symptoms. The finding indicates that the relief funding in the CTC expansion can also have a beneficial impact on the mental health of low-income parents, which underlines the relevance of these types of financial assistance in the light of an unfavorable economic situation.

The study authored by Gurmu et al. (2021) focuses on how taxation on job creation impacts employment in the 159 counties in Georgia between 2000 and 2015. Based on three different empirical approaches, the regression discontinuity design models, difference-in-differences models, and the analysis of the employment changes in the neighbouring census tracts, the study produces mixed results. Altogether, the results indicate that there is no strong evidence that would make it possible to prove the idea that the use of the tax credits is efficient in creating extra job opportunities. The study was limited on job creation tax credits on employment.

Buettner et al. (2023) researched how an income tax credit in respect of hard-to-tax consumer services affects VAT evasion in Germany. It establishes that tax credit promotes VAT compliance among firms by embracing the use of third-party reporting on the last stage of VAT. The credit has robust stimulating influence on reported sales and sales-to-input ratio, and has minimal influences on prices. The study focused on studied on the impact of an income tax credit for hard-to-tax consumer services on VAT evasion.

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Tsiutsiak et al. (2023) analyze the economic nature of the tax-added tax (VAT) system and the schedules of taxes credits that have to be presented with certain types of transactions. The research gives an overview of the existing legal system of the recognition of the VAT tax credits and the description of the accounting records which should be prepared with the aim of the systematization and reporting. It expounds how the accounting process of tax credit claiming is done when goods and material values are received and the acquisitions of tangible assets by enterprises that have to pay VAT under advance payment provisions. The study concerned economic essence of the value added tax and its tax credit dates for various transactions.

2.2.2 Tax Deductions Incentives on Economy Growth

In its research, Dai and Chapman (2022) discuss the initiative of the Italian government to increase the rate of installing battery energy storage systems in tandem with photovoltaic (PV) plants in the residential sector in the wake of the COVID-19 pandemic. These tax deductions subsidized by 110 percent via five year tax break were basis of consideration using an economical model to determine the net present value and break-even point criterion to determine economic viability of this initiative. The findings show that the tax exemption greatly reduced the cost of investing on batteries thus increased profitability. The study was limited Italian government implemented a subsidized tax deduction of 110% over five years.

The implication of the tax system as that of the United States, especially on the taxpayers to reduce local tax by the amount of local tax they pay as a part of their taxable income on the demand of the public goods was studied by Ambrose and Valentin (2024). They based their studies on the school district referendum outcomes and applied a continuous treatment two-way fixed effects model where the percentage of residents using local tax deductions showed significant positive correlation with the demand of local public goods. The results show that a one percentage changes in proportion of resident deducting property taxes is linked to near one percentage fall in approval levels of tax and bond referendums.

The article published by Peng et al. (2019) examines how tax deductions affected the Japanese taxation of income and resident in the last 20 years. It makes use of household micro data with the National Survey of Family Income and Expenditure. According to its findings, the individuals within the high income groups received higher benefits under tax deductions, during their first years, such that, their tax burden decreased more than it happened to the individuals within the low income groups. However, this effect has diminished over time, leading to a more proportional structure in the tax system. Additionally, the research highlights those modifications in the deduction system have lessened the overall tax burden impact, while simultaneously weakening the influence on the Gini coefficient, which measures income inequality.

2.2.3 Tax Exemptions Incentives and Economy Growth In

The study by Miranda et al. (2022) examines the effects of the Brazilian government applying tax exemption policies to overcome economic crises and stagnation. The study covered a decade of data between 2007 and 2017 in examining the impacts of the said exemptions on the industrial activity and the economic growth in different Brazilian municipalities. In the findings, it was shown that although there were certain positive developments related to the industrial activity, the tax exemptions would not contribute to the growth of economy in the considered regions greatly. The study focused on effects of tax exemption on economic growth in Brazil.

Tosun (2020) studied religious tax exemptions in the United States, European Union, and Turkey by comparing them to each other and acknowledging essential differences in tax policies regarding religious organizations in various parts of the world. This study shows that religious entities have no agreed policy on taxation, which might cause different complications. To address these problems, the research recommends the development of national and international legislations that bring laws on taxes in harmony with the notion of the freedom of thought, conscience, and religion. The historical, cultural, and political implications of the maintained disproportions of the tax policies might be enormous, which is why the approach towards the tax exemptions concerning religion should be more unified.

This is because the study by Sebashe et al. (2022) critically evaluates the foreign employment income tax exemption threshold as stipulated in the Income Tax Act. It determines the usefulness of this exemption to South African tax residents receiving different amounts of foreign remuneration about the United Arab Emirates and the United Kingdom. The study is conducted on three scenarios, namely continuation of full exemption as at February 29, 2020, usage of exemption threshold as at March 1, 2020, and possible replacement of exemption as proposed in the Draft Taxation Laws Amendment Bill of 2017. One of the main aspects of the research is to evaluate the reasonability of the existing exemption level, with reference to that minimum exemption level that supposed to allow achieving a break-even situation in taxes in South Africa. The study aimed to limit the impact of the amendment on exemptions for South African tax residents in these jurisdictions.

Nyawanda (2024) evaluated the policy of the Kenya tax exemption in connection with disability in the light of the effect the policy has on the family caregivers of people with severe disabilities through a qualitative research study. The study sample included 17 working family care givers in Nairobi and data were collected based on a semi structure

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interview. The main themes derived in the study were the financial support, social support, physical support, financial relief, better welfare, and ease of access. The results were that the implementation of disability tax exemptions benefited caregivers with greater financial relief, welfare boost and the aspect of increased availability. The study focused on the impact of introducing tax exemptions.

III. METHODOLOGY

3.1 Research Design

Descriptive research design and correlational research design were used in this study. According to Siedlecki (2020), descriptive research is devoted to the detailed description of a situation, and the most subtle opinions can be identified through the perspectives of the respondents with its help. On the contrary, correlational research, which is described by Devi et al. (2022), is one that shows the relationship among variables without manipulating them, which was applied in this study to ascertain the relation that existed between tax incentives (independent variable) and economic growth (dependent variable).

3.2 Population

The target population was 38,647 individuals involved in tax incentive and economy growth in Nyarugenge district. The target population comprised tax incentives coordinator, tax incentives implementers and businesses. The target population is presented below:

Table 1

Target Population

	Study Population
Tax incentives coordinator	1
Tax incentives implementers	40
Business Operators	38606
Total	**38647**

Table 1 shows the study population. The 38,647 individuals involved in tax incentive and economy growth in Nyarugenge district. They were one tax incentives coordinator, 40 tax incentives implementers and 38 606 businesses operate in Nyarugenge district.

3.3. Sample size and sampling technique

A sample size was 396 individuals. This research employed Yamane Taro's formula below:

$$n=N/(1+N(e)^2)$$

where: n: The sample size

N: The population of the study

e: The margin error in the calculation

The current study

N equal 38,647 people

e equal 0.05

n=38674/(1+(38647*0.05*0.05))=395.90

n=396 respondents

The current study has used simple random sampling to recruit study participants form a bigger target population. Target population involved those members of the tax incentives and economic growth in the Nyarugenge district who were 38,674 in number. In selecting the sample size of 396 respondents, every person stood an equal chance of being selected. The researcher applied a systematic approach of the random selection of the participants in the RRA database.

Table 2

Summary of Respondents

Category	**Study Population**	**Sample size**
Tax incentives implementers	40	3
Business Operators	38606	393
Total	**38647**	**396**

Table 2 presents sample size of this study. A sample size of 396 respondents including one tax incentives coordinator, 3 tax incentives implementers and 393 businesses operators in Nyarugenge district.

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3.4 Research Instruments

A structured questionnaire was employed in the study and it was in two parts. Section A was used to obtain demographic data of the respondents, such as the identity of respondents, age, sex and experience. Section B was dedicated to the main areas of the study where possible questions were established to collect the necessary information. The respondents provided their views with Scale 5 (Strongly Agree) to Scale 1 (Strongly Disagree). The questionnaire to be used would give quantitative responses to 3 tax incentive implementers and 393 businesses within Nyarugenge district. Moreover, this study utilized an interview guide to gather qualitative data from a key informant, specifically a tax incentives coordinator.

3.4 Data Analysis Methods

A study utilized the quantitative and qualitative approaches. In this regard, this research employed quantitative approach for quantitative data using descriptive statistics and inferential statistics. In contrast, qualitative data analysis centered on the basic information obtained from respondent answers. In this research, Statistical Package Social Sciences (SPSS) (version 25.0) was used. The descriptive data were analyzed interpretively through the applications of mean and standard deviation as major statistical parameters. In addition, the research used inferential statistics through the regression analysis which is used to explain the association between the economy growth and tax incentives. Here wise regression analysis is a statistical procedure that helps the researcher to explain the association of variables (tax credit incentives, tax deduction incentives and tax exemptions incentives) on the other variable (economy growth).

IV. FINDINGS & DISCUSSION

This section presents and discusses the findings on assessing the effect of tax incentives on economic growth in Rwanda. It is based on evaluating effect of tax credit incentives, tax deductions incentives, and tax exemptions incentives on economy growth of Nyarugenge district.

Table 3

Questionnaire and Response Rate

Questionnaire	Frequency	Percent
Returned and complete	396	100.0
Incomplete and unreturned	0	0.0
Total	**396**	**100.0**

4.1 Profile of participants

The questionnaire was mailed at a significantly high rate, 396 distributed questionnaires were completed and returned leading to a proportion of 100.0%. The importance of the researcher in conducting the process was that the researcher was able to explain the importance of the study as well as give clear guidelines to the respondents who were having a hard time trying to fill in the questionnaire.

Table 4

Gender of Respondents

	Frequency	Percent
Male	160	40.4
Female	236	59.6
Total	**396**	**100.0**

The results depicted in the table above show that, a total number of 396 respondents were used, that is, 59.6 percent were female and 40.4 percent male. Such information exposes equality between the males and females, with the higher number of female participants taking part in the research. The proportion of men and women in the sample taken is important in analyzing how various groups perceive apprehend and how they use business resources in the Nyarugenge district.

Table 5

Age group of Respondents

Age	Frequency	Percent
Between 18-30years	89	22.5
Between 31-40 years	42	10.6
Between 41-50 years	175	44.2
51 years and above	90	22.7
Total	**396**	**100.0**

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The results shown in Table above demarcate the age of the 396 respondents. It should be noted that 44.2 percent is between the age ranges of 41-50 making it the largest population group in the study. As well, 22.7 percent of the respondents are 51 years and above as opposed to 22.5 percent who are found in the age bracket of 18-30 years. The least size, which has 10.6 percent respondents, has age 31-40 years. The study makes a point of the importance of the age factor in shaping the preferences, knowledge and behaviours of people. The study underscores the critical role of age in influencing individuals' preferences, knowledge, and behaviors.

Table 6

Educational level of Respondents

Education	**Frequency**	**Percent**
Primary	109	27.5
Secondary	173	43.7
Bachelor	89	22.5
Master	25	6.3
Total	**396**	**100.0**

The data in this study concerning the distribution of the education level among the 396 respondents show the high diversity of educational backgrounds. There is a relatively large number of people (43.7 percent) who have attained secondary school education whereas 27.5 percent have received primary education only. Conversely, 22.5 percent of the participants are bachelor degree holders and a scanty 6.3 percent of have a master`s degree. Such distribution shows that most respondents possess either primary or secondary education only.

Table 7

Work experience of Respondents

Work Experience	**Frequency**	**Percent**
Below 2 years	153	38.6
Between 3-5 years	159	40.2
Between 6-10 years	72	18.2
11 years and above	12	3.0
Total	**396**	**100.0**

Table above refers to the results of the distribution of experience of respondents. Of the 396 respondents, 38.6 percent respondents had less than 2 years experience in business, 40.2 percent had a business experience between 3-5 years. In addition, 18.2 percent had 6-10 years professional background experience in business whereas 3.0 percent of respondents had a business experience of 11 years and more. The business professional experience of the majority group is 3-5 years. The levels of business experiences amongst the members of this team are varied, a fact that can show that it would be well balanced.

4.2 Descriptive Statistics

The study utilized a five-point Likert rating scale to assess respondents' opinions on the impact of tax incentives on economic growth in Rwanda. The scale ranged from 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly Agree), allowing for a nuanced understanding of respondent opinions. Mean values were categorized to interpret the strength of opinions, with ranges defined as very low (0.01-1.00), low (1.01-2.00), moderate (2.01-3.00), high (3.01-4.00), and very high (4.01-5.00). Further, to analyze the data's consistency, standard deviation was employed. A standard deviation of equal or less than 0.5 indicated homogeneity among responses, while a value greater than 0.5 suggested heterogeneity.

Table 8

Effect of tax credit incentives on economy growth of Nyarugenge district

Statements	**Mean**	**Std. Dev.**
Tax credit managers employ tax liability to decrease the amount of tax owed by businesses	4.00	1.221
Direct credits allow taxpayers to reduce their tax liability directly	3.92	1.218
Refundable credits allow taxpayer to receive a cash refund	3.90	1.057
Refundable credits play a significant role in the tax system	4.16	1.019
Overall	**3.99**	**1.128**

From the study findings, the Table above presents the descriptive findings on effect of tax credit incentives on economy growth of Nyarugenge district. It shows great consent among the respondents on whether tax credit managers

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are effective in using tax liability to decrease the tax burden on businesses. The obtained values show the mean score as high 4.00 with a positive agreement and a standard deviation of 1.221 that implies a differentiated response. Furthermore, the respondents have admitted that the taxpayer can reduce their tax payment using direct tax credits with the mean rating of 3.92 and standard deviation of 1.218, once again signifying the positive attitude and multiple viewpoints.

Moreover, the study shows that the respondents have a very positive attitude towards tax returns in form of refunds. Having a high mean score of 3.90 and standard deviation of 1.057, it is possible to say that the majority of respondents agree with the fact that these credits allow taxpayers to obtain cash refunds and there is a slight discrepancy in their personal views. Moreover, higher average score of 4.16 with standard deviation of 1.019 proposes high consensus that the tax system cannot exist without refundable credits, extending a rather significant degree of diversity in the responses.

The very strong positive perception that there is the effect of tax credit incentives on economy growth of Nyarugenge district is reflected by the aggregated mean of the combined statements at 3.99 (SD=1.129). It resonates with what Chen and Yang (2019) stated that tax credits provide a great motivation to firms that are reluctant to improve their investment in innovative operations. This indicates the firms receiving these tax credits are more inclined to have a greater output of innovations and the addition of the R&D taxes credits has helped in increasing the competitiveness of businesses in China and this has led to the creation of an innovative culture in China. Other studies of Serdinova (2023) confirmed the findings as they stated that there exists a correlation between economic growth and tax incentives in Turkey. There is a higher positive relationship between the Gross Domestic Product (GDP) and the tax incentive policies especially among the corporate income tax incentive policies, personal income tax incentive policies, and value added tax incentives policies. This points out that all the three corporate income tax incentives, personal income tax incentives, and value-added tax incentives have a positive impact on the GDP of the country.

According to the how tax credit incentives affect economy growth of Nyarugenge district, the interviewee stated

> *"Tax credit incentives play a significant role in stimulating economic growth in the Nyarugenge district. By reducing the tax burden on individuals and businesses, these incentives encourage investment and spending, which can lead to increased economic activity. Furthermore, tax credits can attract new businesses to the district, enhancing competition and innovation. Additionally, the implementation of tax credit incentives in Nyarugenge district not only fosters a more vibrant business environment but also enhances the overall quality of life for its residents by promoting sustainable economic development*".

The findings also confirm Agency Theory of Tax Incentives (ATTI) as important to this study as it emphasizes the relationship between principals and agents in the context of taxation. It provides a framework for understanding how tax policies can be strategically utilized to influence agent behavior, thereby promoting better alignment of interests and enhancing organizational performance. In the context of underpinning the effect of tax credits on economy growth in Nyarugenge district, the tax incentives managers need for meticulous design in tax incentive programs such reductions in tax liability, direct credits against taxes owed, and refundable credits that can result in a cash refund.

Table 9

Effect of Tax Deductions Incentives on Economy Growth of Nyarugenge District

Statements	Mean	Std. Dev.
Effectively utilization tax deductions for specific expenses are critical component of tax strategy	3.99	1.161
Tax deduction for specific expenses is significantly reduced businesses' taxable income	3.93	1.400
Tax deduction for specific activities is important to reduce taxable income	3.83	1.286
Tax deductions for particular category of income significantly impact a businesses' overall tax liability	3.99	1.361
Overall	**3.93**	**1.302**

The results provided in this paper evolve a positive correlation with high values between the economic growth in the Nyarugenge district and tax deduction incentives. The respondents all concur that the tax strategy requires proper use of tax deductions of special expenses which is exhibited by a high mean score of 3.99. The opinions are more or less consistent as evidenced by the standard deviation of 1.161. Also, the respondents are strongly in agreement that tax deductions have a very proficient effect of reducing the taxable revenue of businesses with a mean of 3.93 and standard deviation of 1.400 which possesses a relatively non-homogenous benchmark of approval.

Moreover, the statement which stated the importance of the tax deduction feature of specific activities in tax reduction to taxable income recorded a very high mean score of 3.83, which means that there is strong positive agreement among the respondents. However, there is some degree of non-homogeneity in answers among respondents indicated by the standard deviation of 1.286. Continuing on the statement that the Tax deductions of a specific type of income is influential on the total tax burden facing a businesses, the high value of 3.99 reveals the fact that there is a high positive

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agreement but its standard deviation of 1.361 presents an impression that there is variety in thoughts that respondents share.

The general strong positive mean 3.93 (SD=1.302) of the composite statements indicates that the general perception is that there is effect of tax deductions incentive on the economy growth of Nyarugenge district. The research results are consistent with the findings of a study done by Ambrose and Valentin (2024) examined on the United States tax regime which enables taxpayers to deduct local taxes on their billable revenues, a factor that influences the demand of public goods. According to a study there is a positive relationship local good goods demand and the number of residents who to deduct local taxes. The decline in property taxes deductions also reduces the level of tax and bond referendums by 0.97 percentage. The higher-incomes earners in the federal tax deductions can lead to a worse distribution in the services given to the populace. Moreover, Amankwaah et al. (2022) states that tax incentives have been useful in bringing investments in the rural region, hence activating the region economically, leading to its development. With the incentives, it has persuaded companies to open shop in less developed areas where it has resulted to employment as well as the level of income earned by the locals has been elevated.

Regarding to the how tax deductions incentives affect economy growth of Nyarugenge district, the interviewee stated

> "*Tax deduction incentives play a significant role in stimulating economic growth in the Nyarugenge district. By reducing the tax burden on individuals and businesses, these incentives encourage increased investment and spending. This influx of capital lead to the establishment of new enterprises, expansion of existing businesses. Moreover, tax deductions can attract external investors who are looking for favorable conditions to establish their operations. This can result in a more competitive business environment, fostering innovation and efficiency among local firms. In summary, tax deduction incentives are a powerful tool for driving economic growth in Nyarugenge district by promoting investment, creating jobs, attracting external capital, and supporting key sectors".*

The findings also confirm Theory of Deduction (TD) as meaningful to this study as a logic branch that emphasizes formal principles and methods for determining conclusions from premises. In the context of effect of tax deductions incentives on economy growth of Nyarugenge district, tax incentive managers used this theory for guiding optimal tax policy like specific expenses, certain activities and particular categories of incomes. Additionally, they employ this deduction theory in enhancing economy thinking and analytical skills.

Table 10

Effect of Tax Exemptions Incentives on Economy Growth of Nyarugenge District

Statements	Mean	Std. Dev.
Taxpayers are aware of the limits and conditions associated with tax exemption for specific expenses	4.00	1.158
Tax exemptions allow taxpayers to exclude certain costs from their taxable income	4.02	1.043
Taxpayers understand which items qualify for tax exemptions	4.17	1.045
Taxpayers are aware of the criteria and implications associated with tax exemption for services	3.99	1.084
Overall	**4.04**	**1.082**

Based on the results of the study, taxpayers in Nyarugenge district had a lot of awareness about the threshold and requirements linked to the provided tax exemption incentives as the mean value of 4.00 (SD=1.158) shows. This would imply great positive agreement by the respondents though their responses have a range of variation as indicated by the standard deviation. Moreover, the respondents also had a majority opinion that through tax exemptions, taxpayers allow themselves to avoid reporting some costs in taxable income with an even higher mean score of 4.02 (SD=1.043). Such a very high mean score supports a very strong positive overall agreement and yet the standard deviation once again shows a range of views among the participants.

The results of this analysis show that citizens have a good knowledge concerning tax exemption eligibility having attained high mean of 4.17. This is a general consensus of the respondents, but even the standard deviation figure of 1.045 indicates that the opinions are divided. Moreover, the taxpayers demonstrate their awareness about the criteria and implication of tax exemption of services with a mean score of 3.99, which also implies high agreement, but a standard deviation of 1.084 means that the responses were diverse.

The overall, the research indicates that strong positive perception of tax exemption incentive impact on economic growth in Nyarugenge district has highly impacted on the mean score that is 4.04 (SD=1.082). The same is supported by the study of Miranda et al. (2022), who considered the economic growth in Brazil in the context of an economic crisis under the influence of tax exemptions. The decade research conducted by them in 2007-2017 noted some positive trends in the industrial activities due to tax exemption policy that had rolled out in different municipalities. Charumbira (2024) also talks about the shift in focus among Botswana to diversify the economy to achieve more employment opportunities as opposed to mainly focusing on raw diamond mining and exporting. Such diversification is regarded as an important program towards sustainable economic growth. Additionally, Ahumuza (2022) merely

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stresses the significance of tax incentive in Uganda as a crucial policy of the public finance to enhance the fulfilment of the economic and social rights with the purpose to encourage development and investment.

Concerning the how tax exemptions incentives affect economy growth of Nyarugenge district, the interviewee stated:

> ”*Tax exemption incentives play a significant role in stimulating economic growth in the Nyarugenge district. By reducing the financial burden on businesses and individuals, these incentives encourage investment and entrepreneurship. Moreover, tax exemptions can attract external investors who are looking for favorable conditions to establish their operations. Additionally, tax exemptions facilitate the development of infrastructure and public services, as businesses that prosper may contribute to local development initiatives. In summary, tax exemption incentives are a powerful tool for promoting economic growth in Nyarugenge district by fostering investment, creating jobs, attracting external capital, and enhancing local infrastructure and services”.*

The findings confirm as it seeks to maximize profits and governments aim to enhance the utility of a representative agent. These models demonstrate that tax competition leads to tax rates or exemptions being driven to inefficiently low levels. In the context of effect of tax exemptions incentives on economy growth of Nyarugenge district, tax incentives managers use the theory of tax competition in exemptions for specific expenses, exemptions for specific goods and exemption for specific services.

Table 11

Effect of Tax Incentives on Economy Growth of Nyarugenge District

Statements	**Mean**	**Std. Dev.**
Tax incentives are significantly increased productivity	4.03	1.055
Tax incentives are significantly created employment	3.85	1.078
Tax incentives are significantly increased GDP rate	3.78	1.154
Tax incentives are significantly increased economy	4.01	1.084
Overall	**3.91**	**1.092**

The results attributed to the examination of the effectiveness of tax incentives on the growth of the economy within the Nyarugenge district bring a lot of insight. To the statement, Respondents rated the level of positive agreement with high mean of 4.03 showing that indeed tax incentives do boost productivity a lot. Such a score indicates an agreement by the participants even though the standard deviation is 1.055 which tends to indicate that some of the participants were inconsistent in their answers. As well, when it comes to the impact of tax incentives in job creation; there is a significant agreement, with the mean score being 3.85, which also serves to signify a high positive score. The standard deviation of 1.078 also indicates that response is not quite homogenous in views of the respondents. Comprehensively, the statistics reiterate the subjective benefit of tax incentives in enhancing productivity and employments in the district.

The data analyzed indicates a high level of agreement among participants regarding the impact of tax incentives on the GDP rate and the economy. The mean score for the statement on the GDP rate is 3.78, reflecting positive sentiment, while a standard deviation of 1.154 suggests varying opinions among respondents. Similarly, the mean score for the economy is 4.01, which shows a very strong positive agreement, although the standard deviation of 1.084 indicates some diversity in responses.

The overall high mean score of 3.91 (SD=1.092) for the combined statements reflects an overall strong positive perception that there is effect of tax incentives on economy growth of Nyarugenge district. The study findings align with a study conducted by Oghogho et al. (2023) noted that tax incentives significantly impact economic growth in Nigeria. Tax incentives play a crucial role in fostering economic growth in Nigeria. The government is encouraged to create and enforce legislation that enhances investment support specifically targeted at the manufacturing sector. Niyonizera and Twesigye (2024) added that the emphasis of tax incentives highlights the importance of supportive policies in attracting and retaining businesses, which can lead to sustainable growth and increased employment opportunities for the local population.

Regarding to the how tax incentives affect economy growth in Rwanda, the interviewee stated

> *“Tax incentives play a significant role in driving economic growth in Rwanda by attracting both domestic and foreign investments. These incentives, which may include reduced tax rates, exemptions, and credits, create a favorable business environment that encourages entrepreneurs to establish and expand their operations. Moreover, tax incentives stimulate specific industries that are crucial for Rwanda's development, such as agriculture, technology, and tourism. Additionally, the effective implementation of tax incentives enhances government revenue in the long term. As businesses grow and become more profitable, they contribute to the tax base”.*

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4.3 Inferential Statistics

The study employed inferential statistics, including hypothesis testing, model summary, Analysis of Variance (ANOVA) and regression coefficients, to examine the relationships among the study variables. This analytical approach aimed to provide insights into the strength and nature of these relationships. The research was structured around three specific hypotheses, which guided the investigation and analysis of the data: Ho1: There is no significant effect of tax credit incentives on economy growth of Nyarugenge district; Ho2: There is no significant effect of tax deductions incentives on economy growth of Nyarugenge district; and Ho3 There is no significant effect of tax exemptions incentives on economy growth of Nyarugenge district.

Table 12

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.911[a]	.831	.830	.40011

a. Predictors: (Constant), Tax exemption incentives, Tax credits incentives, Tax deduction Incentives

From the study findings, Table above deals with Model Summary for the regression analysis. The R value of 0.911 indicates a very strong positive correlation between the predictors (Tax credit incentives, Tax deductions incentives and Tax exemptions incentives) and economy growth in Nyarugenge district.

R Square value of 0.831 designates that approximately 83.1% of variability in the economy growth in Nyarugenge district can be clarified by the independent variables in the model. Results aligned with Amankwaah et al. (2022) asserted that, in Ghana, tax incentives have played a significant role in attracting investment to rural areas, thereby stimulating economic activities and contributing to local development. Sidelnykova et al. (2022) posited tax incentives play an important role in shaping tax policy, as they are designed to achieve specific social and economic objectives. The research focuses on evaluating how these incentives affect the operations of business entities. It also seeks to identify strategies to enhance their efficiency and competitiveness in the market.

Table 13

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	308.180	3	102.726	641.675	.000[b]
	Residual	62.756	393	.159		
	Total	370.936	396			

a. Dependent Variable: Economy growth

b. Predictors: (Constant), Tax exemption incentives, Tax credits incentives, Tax deduction Incentives

Table above provides the analysis of variance (ANOVA) where the F-statistic is highly significant at 641.675, and it is not 0 (the p-value is 0.000). In this F-statistic, the overall significance of the regression model is tested and the question answered on whether there is a significant difference between the predictors of tax credit incentives, tax deduction incentives and tax exemption incentives, and the economic growth in the Nyarugenge district. Since p-value is less than 0.05, it implies that there is a significant contribution of these predictors to the variance in economic growth in the district. The findings are supported by the emphasis of Serdinova (2023) who asserted that there is a correlation between tax incentives and economic growth in Turkey. Sidelnykova et al. (2022) posited tax incentives play an important role in shaping tax policy, as they are designed to achieve specific social and economic objectives. The research focuses on evaluating how these incentives affect the operations of business entities.

Table 14

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.220	.091		2.417	.017
	Tax credits incentives	.152	.034	.149	4.470	.000
	Tax deduction Incentives	.109	.028	.138	3.892	.000
	Tax exemption incentives	.657	.040	.676	16.425	.000

a. Dependent Variable: Economy growth

The study adopted multiple regression models below:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Therefore, economy growth = 0.220 + 0.152 (Tax credit incentives) + 0.109 (Tax deduction incentives) + 0.657 (Tax exemption incentives) + 0.091.

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Table 14 shows the coefficients for the regression model predicting economy growth in Nyarugenge district based on the predictors like tax credit incentives, tax deductions incentives and tax exemptions incentives. The constant term has an unstandardized coefficient (B) of 0.220 with a standard error of 0.091 ($p=0.017<0.05$).

4.3.1 Hypotheses Testing

Hypothesis one stated that there is no significant effect of tax credit incentives on economy growth of Nyarugenge district. Findings revealed that tax credit incentives have positive coefficient of the estimate which was significant ($\beta=0.152$, $p=0.000<0.05$). The null hypothesis was rejected and it was concluded that tax credit incentives have positive and significant effect on economy growth of Nyarugenge district. This suggests that for every one-unit increase in tax credit incentives, these is a 0.152-unit increase in the economy growth of Nyarugenge district. The findings align with Gurmu et al. (2021) study examined the impact of job creation tax credits on employment in Georgia's 159 counties over a 15-year period. Using three empirical approaches: regression discontinuity design models, difference-in-differences models, and employment differences in bordering census tracts, the study finds mixed results, but generally provides little evidence to support the claim that tax credits create additional employment. The study was limited on job creation tax credits on employment. Buettner et al. (2023) studied on the impact of an income tax credit for hard-to-tax consumer services on VAT evasion in Germany.

Likewise, the hypothesis one stated that there is no significant effect of tax deduction incentives on economy growth of Nyarugenge district. Findings revealed that tax deduction incentives have positive coefficient of the estimate which was significant ($\beta=0.109$, $p=0.000<0.05$). The null hypothesis was rejected and it was concluded that tax deduction incentives have positive and significant effect on economy growth of Nyarugenge district.

This suggests that for every one-unit increase in tax deduction incentives, these is a 0.109-unit increase in the economy growth of Nyarugenge district. The findings are supported by Ambrose and Valentin (2024) studied on the United States tax system permits taxpayers to deduct local taxes from their taxable incomes, which has implications for public goods demand. In addition, Peng et al. (2019) study investigates the effects of deductions on Japan's income and resident tax systems over a two-decade span, utilizing household microdata from the National Survey of Family Income and Expenditure.

Lastly, the hypothesis one stated that there is no significant effect of tax exemption incentives on economy growth of Nyarugenge district. Findings revealed that tax exemption incentives have positive coefficient of the estimate which was significant ($\beta=0.657$, $p=0.000<0.05$). The null hypothesis was rejected and it was concluded that tax exemption incentives have positive and significant effect on economy growth of Nyarugenge district. This suggests that for every one-unit increase in tax exemption incentives, these is a 0.657-unit increase in the economy growth of Nyarugenge district. The findings align with Miranda et al. (2022) studied on effects of tax exemption on economic growth. The Brazilian government introduced exemption tax policies as a response to economic crisis and stagnation. A study conducted over a decade, from 2007 to 2017, analyzed the effects of these tax exemptions on industrial activity and economic growth across various Brazilian municipalities. Moreover, Tosun (2020) studied compares religious tax exemptions in the US, EU, and Turkey, revealing basic differences in religious-based tax exemptions and evaluating tax exemptions for religious organizations in general.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study aims to investigate the effect of tax incentive on economy growth in Rwanda. Specifically, the effect of tax credit incentives, tax deductions incentives and tax exemptions incentives on economy growth of Nyarugenge district. To start with, the research was to establish whether tax credit incentive has an impact on economic growth in the Nyarugenge district. The results point out toward an affirmative and substantial power between tax credit incentives and area economic growth. Accordingly, the research is of the opinion that tax credit incentive is a useful means to economic growth in the Nyarugenge district. Second, according to the objective number two, to analyze the impact of tax deduction incentives to economy growth in Nyarugenge district, the study observes that the descriptive result on effect of tax deduction incentives to economy growth of Nyarugenge district was positive and outstanding. In this respect the study infers that there exists influence of deduction incentives on the growth of the economy of the Nyarugenge district. Finally, the research was propounded on the analysis of tax exemptions incentives to economic growth in Nyarugenge district. The result shows that tax exemptions have a positive significant relationship with economic growth in the region. It is therefore the study finding that tax exemption incentives are important towards economic development in Nyarugenge district.

5.2 Recommendations

The study investigates the effect of tax incentives on economic growth in Rwanda, focusing specifically on the Nyarugenge district. It examines three types of tax incentives: tax credits, tax deductions, and tax exemptions. Firstly,

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the findings indicate a positive and significant relationship between tax credit incentives and economic growth, concluding that tax credit incentives effectively contribute to the economic development of Nyarugenge district. However, tax incentive managers should understand the local economic landscape and identify sectors that would benefit most from tax credit incentives. They should also implement targeted tax credits; the district can attract new businesses and encourage existing ones to expand. Additionally, they should monitor and evaluate the mechanisms for making necessary adjustments over time. Secondly, the findings indicate a positive and significant relationship between tax deduction incentives and economic growth, concluding that tax deduction incentives effectively contribute to the economic development of Nyarugenge district. However, tax incentives managers should create awareness for encouraging investment and entrepreneurship. By effective communication and outreach to inform potential investors about the available tax deduction incentives, there is raising awareness and simplifying the application process, and the district can maximize participation in these programs. Lastly, the findings indicate a positive and significant relationship between tax exemption incentives and economic growth, concluding that tax exemption incentives effectively contribute to the economic development of Nyarugenge district. However, the study suggests that tax exemption incentives should be strategically designed to benefit sectors with high growth potential, such as technology, tourism, and agriculture. Additionally, tax incentive managers should engage with local stakeholders and businesses for meeting the specific needs of the businesses.

REFERENCES

Ahumuza, A. D. (2022). *Tax incentives and the realisation of economic and social rights: The right to basic education in Uganda* (Doctoral dissertation, University of Pretoria).

Amankwaah, E., Mensah, N., & Baidoo, N. O. (2022). The impact of location tax incentives on the growth of rural economy: evidence from Ghana. *Future Business Journal*, *8*(1), 1-19.

Ambrose, B. W., & Valentin, M. (2024). Federal tax deductions and the demand for local public goods. *Review of Economics and Statistics*, *1*(1), 1-39.

Appiah-Kubi, S. N. K., Malec, K., Phiri, J., Maitah, M., Gebeltová, Z., Smutka, L., Blazek, V., Maitah, K., & Sirohi, J. (2021). Impact of Tax Incentives on Foreign Direct Investment: Evidence from Africa. *Sustainability*, *13*(15), 8661. https://doi.org/10.3390/su13158661

Bahizi, C. (2016). *The impact of tax laws and tax incentives on foreign direct investment in Rwanda (2010–2015)* (Doctoral dissertation, University of Rwanda).

Bauer, T., Kourouxous, T., & Krenn, P. (2018). Taxation and agency conflicts between firm owners and managers: a review. *Business Research*, *11*(1), 33-76.

Bratton, W. (2012). Agency theory and incentive compensation. *Research handbook on executive pay*, *1*(1), 101-122.

Buettner, T., Madzharova, B., & Zaddach, O. (2023). Income tax credits for consumer services: A tool for tackling VAT evasion? *Journal of Public Economics*, *220*(1), 251-262.

Charumbira, N. S. (2024). *Tax Incentives, Foreign Direct Investment, and Tourism Sector Employment Creation in Botswana* (Doctoral dissertation, Walden University).

Chen, L., & Yang, W. (2019). R&D tax credits and firm innovation: Evidence from China. *Technological Forecasting and Social Change*, *146*(1), 233-241.

Dai, X., & Chapman, G. (2022). R&D tax incentives and innovation: Examining the role of programme design in China. *Technovation*, *113*(1), 1-19.

de Paiva Siqueira, A. (2017). The Theory of Deduction of Legal Personality in Law 12.846/2013. *Law J. Pub. Admin.*, *1*(3), 1-75.

Devi, R., Pradhan, S., Giri, D., Lepcha, N., & Basnet, S. (2022). Application of correlational research design in nursing and medical research. *Journal of Xi'an Shiyou University, Natural Sciences Edition*, *65*(11), 60–69.

Givati, Y. (2019). Theories of Tax Deductions: Income Measurement versus Efficiency. *Journal of Law, Finance, and Accounting*, *5*(1), 107-136.

Gugl, E., & Zodrow, G. R. (2019). Tax competition and the efficiency of "benefit-related" business taxes. *International Tax and Public Finance*, *26*(3), 486-505.

Gurmu, S., Sjoquist, D. L., & Wheeler, L. (2021). The effectiveness of job creation tax credits. *Regional Science and Urban Economics*, *90*(1), 103-121.

Keen, M., & Konrad, K. A. (2013). The theory of international tax competition and coordination. *Handbook of public economics*, *5*(1), 257-328.

Mbogo, J. N. (2022). *The Impact of Tax Incentives on Foreign Direct Investments in Kenya* (Doctoral dissertation, University of Nairobi).

Miranda, M. S., Ferreira, M. A. M., Abrantes, L. A., & Macedo, S. V. (2022). Effects of tax exemption on economic growth. *BBR. Brazilian Business Review*, *19*(2), 171-188.

Licensed Under Creative Commons Attribution (CC BY-NC)

Nam, J., & Kwon, S. J. (2024). Expansion of child tax credits and mental health of parents with low income in 2021. *JAMA Network Open*, *7*(2), 1-11.

Ndemezo, E., & Ndikubwimana, J. B. (2020). Determinants of productivity of Rwandese food and beverage processing sector: do tax incentives matter? *Rwandan Economy at the Crossroads of Development: Key Macroeconomic and Microeconomic Perspectives*, *1*(2), 217-230.

Niyongabo, P., Twesige, D., & Hagenimana, F. X. (2022). Effect of tax incentives on Rwandan foreign direct investment growth:(2012-2021). *The Strategic Journal of Business & Change Management*, *9*(4), 1690-1709.

Niyonizera, F., & Twesigye, D. (2024). Effect of Tax Reform on Revenue Collection Performance in Rwanda: A Case of Rwanda Revenue Authority Headquarters. *Journal of Finance and Accounting*, *8*(4), 19-31.

Nyawanda, L. (2024). *Review of the Kenya Tax Exemption Policy on Disability and Roles of Family Caregivers* (Doctoral dissertation, Walden University).

Oghogho, G., Osarobo Emmanuel, E., & Amibor, N. H. (2023). Tax Incentive and Economic Growth. *Journal of Contemporary Issues*, *1*(2), 37-46.

Olayemi, B. K., & Folajimi, A. F. (2021). Tax incentives and the growth in sales revenue of small and medium enterprises (SMEs) in Ondo and Ekiti States, Nigeria. *International Journal on Data Science and Technology*, *7*(1), 1-16.

Panda, B., & Leepsa, N. M. (2017). Agency theory: Review of theory and evidence on problems and perspectives. *Indian journal of corporate governance*, *10*(1), 74-95.

Peng, L. M., Yoke, C. C., Ling, T. P., Kandasamy, S., & Yean, U. L. (2019). An overview of current tax incentives matters among companies in Malaysia. *Journal of Contemporary Issues and Thought*, *9*(1), 1-11.

Popper, K. R. (2022). On the Theory of Deduction, Part II. *The Logical Writings of Karl Popper*, *58*(11), 322-331.

Pravdiuk, M. (2022). Tax incentives in legal regulation. *Knowledge, Education, Law, Management.2*(46), 151-157.

Sebashe, K., Erasmus, H. L., & Erasmus, M. M. (2022). A case study review and reasonability assessment of the foreign employment income tax exemption threshold in section 10 (1)(o)(ii) of the Income Tax Act. *South African Journal of Accounting Research*, *36*(3), 250-271.

Serdinova, A. (2023). Economic Analysis of Tax Incentives Impact on Economic Growth: Evidence from Turkey. *Zeszyty Naukowe Wyższej Szkoły Turystyki i Ekologii*, *12*(1), 6-13.

Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist*, *34*(1), 8-12.

Sidelnykova, L., Ovsiuk, N., Savastieieva, O., Kozak, S., Lishchuk, N., & Zinchenko, A. (2022). Tax incentives in the system of state financial support of economic entities. *Economic Affairs*, *67*(4), 653-659.

Sinenko, O. A. (2024). Tax incentives for economic growth in the Russian Far East: broad vs. targeted stimuli. *Emerging Science Journal*, *8*(3), 1153-1166.

Siregar, R. A., & Patunru, A. (2021). The Impact of Tax Incentives on Foreign Direct Investment in Indonesia. *Journal of Accounting Auditing and Business*, *4*(1), 66-80.

Suwanda, S. (2023). The Role of Tax Incentives in Encouraging Innovation and Technology Adoption in Industrial Management. *Atestasi: Jurnal Ilmiah Akuntansi*, *6*(2), 718-729.

Tekin, H., & Polat, A. Y. (2020). Agency theory: A review in finance. *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi*, *8*(4), 1323-1329.

Tiutinyk, I., Mazurenko, O. (2021). The Theory of International Tax Competition: Comparative Analysis. SocioEconomic Challenges, *5*(3), 134-138.

Tsiutsiak, I., Tsiutsiak, A., & Tsiutsiak, V. (2023). Tax credit for tax on added value: current state of accounting and electronic administration. *Ekonomichnyy analiz*, *33*(2), 230-238.

Tosun, A. N. (2020). Tax exemptions for religious organizations: The United States, the European Union, and Turkey. *Hacettepe Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *38*(3), 609-628.

Ukwizagira, G., & Mbereyaho, L. (2023). Strength assessment of improved adobe brick using natural stabilizers. *Mediterranean Journal of Basic and Applied Sciences (MJBAS)*, *7*(1), 14-26.

Woodgate, R. (2020). Can tax competition boost demand? Causes and consequences of the global race to the bottom in corporate tax rates. *Review of Keynesian Economics*, *8*(4), 512-535.

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Assessing administrative effectiveness of the m-mama emergency transport system: A case of Mtwara Region, Tanzania

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ABSTRACT

This study aimed at addressing the administrative effectiveness of the m-mama emergency transport system in Mtwara Region, Tanzania. The main objective of the study was to assess the administrative effectiveness of the m-mama emergency transport system, and the specific objectives were to evaluate the operational efficiency of the M-Mama dispatch center in coordinating emergency transport, to investigate factors affecting community utilization of the M-Mama services, and to identify administrative challenges within the program's implementation. The study was guided by health system theory. The target population of the study was 123 individuals. Both qualitative and quantitative methods approaches were adopted, involving a sample of 59 participants drawn from dispatch personnel, healthcare workers, and community members. Simple random sampling and purposive sampling were used as sampling methods.Structured questionnaires and semi-structured interviews were applied as data collection tools. The questionnaire guide and interview questions were the tools of data collection. The descriptive analysis was adopted to analyze the quantitative data and thematic analysis to analyze the qualitative data, and SPSS was used to assist the analysis. The findings showed that as much as the M-Mama program has led to awareness creation with regard to emergency response and facilitated access to maternal health services, a number of barriers to operation and system operation still exist. The lack of road works, communication devices, and poor organization of the various agencies were the main factors limiting the efficiency and responsiveness of the dispatch center. Further, a poor workforce and few training opportunities for emergency responders also deterred the successful running of the program. Other factors that negatively affected the community's utilizations of the services were socio-cultural beliefs and poor community awareness. Based on the study, it is concluded that to maintain the sustainability and success of the M-Mama emergency transport system, there is a need to put in place efforts to improve the road networks, communication systems, and administrative coordination, as well as invest in building the capacity of the staff. The results have significant implications for policymakers, health organizations, and donors who pursue enhanced emergency maternal care provision in underserved and rural areas. The paper suggested that community education programs ought to raise awareness and appreciation of the M-Mama services in the rural settings. There also needs to be standards of communication between dispatch centers and health facilities so that M-Mama would become more effective.

Keywords: Administrative Effectiveness, m-mama Emergency Transport System, Mtwara Region, Tanzania

I. INTRODUCTION

Maternal mortality has continued to pose a significant challenge in the world, particularly in low- and middle-income countries (LMICs), where most of the maternal deaths noted are above 90 percent (World Health Organization 2023). Among the many important interventions in minimizing such deaths is the development of emergency maternal transport mechanisms that decrease the second delay in seeking treatment in a health facility. Research and evidence over the world present that with good transport systems in place, maternal and neonatal outcomes are very much enhanced (Zachariah et al., 2009). Nonetheless, their success is closely connected with the administrative control with regard to real-time communications, adequate paperwork, workforce and equipment availability. With an increasing pace of digital transformation in healthcare, most emergency transport systems currently utilize mobile technology to boost coordination and response time (Mlambo et al., 2022).

Poor infrastructure, lack of health work force, and poor administrative coordination follow high rates of maternal mortality in sub-Saharan Africa. Nigeria, Uganda, and Tanzania are among the countries that have preceded to community-based transport programs to enhance referrals in maternal health. Nevertheless, numerous assessments show that these systems are likely to be a disappointment because of administrative failures like the lack of data reporting systems, ambiguous referral processes, and the failure to be continuously financed (Mooney et al., 2023). Bittaye et al.

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(2023) in their meta-analytical study also discovered that the efficiency of transport programs raises significantly in the case of sustained administrative follow-up and cross-agency cooperation.

Tanzania has introduced a number of projects in order to deal with maternal health, such as the M-Mama initiative, especially in underdeveloped areas such as Shinyanga and Mtwara. The M-Mama system reportedly applies 24-hour dispatch model, mobile-phone coordination, and community drivers to deliver mothers with obstetric emergencies (Munishi et al., 2023). Research notes that the model, in terms of structure, is quite successful, but there is a broad range of results depending on the efficiency at the levels of regions and councils (Ehiri et al., 2018). The problematic areas are that health facilities are all over the place in terms of reporting, interdepartmental communication is either lacking totally or inefficient and there is also a shortage of staffing and lastly they have a problem of disrupting the timely coordination of the dispatch.

The structure of the M-Mama system is centralized with the dispatch center, which needs proper and urgent contacts with the medical surrounding and the community transportation centers. According to the study conducted by Njiro et al. (2023), the importance of Regional and Council Health Management Teams (R/CHMTs) in managing referrals, tracking the use of transportation, and managing dispatch employees should be noted. But in those jurisdictions where such administrative mechanisms are poorly funded or poorly staffed, there is no coordination. As their assessment conducted of community engagement activities showed, despite high rates of community awareness, setbacks were still experienced in terms of administrative mismatch and a lack of real-time reporting systems.

A lot of the initial achievements of M-Mama were documented in Shinyanga, where research reported that the efficiency of maternal referrals has increased significantly (Sanga et al., 2025). They have however also documented issues of their scaling and administrative sustainability of the system which includes budget planning, the supply chain to supply fuel and vehicles and insufficient health information system integration. Such lessons can be applied even to Mtwara directly, which also has limitations in the sphere of logistics and infrastructure. According to Ifeanyichi et al. (2021), in most cases, health facilities did not have trained emergency coordination officers and there was a lack of communication between the dispatch teams and the health facility officers in high stress situations.

Connectivity plays a key role in the functionality of M-Mama, as dispatch and triage decisions depend heavily on mobile phone-based communication. Studies from the Urban Birth Collective (2025) show that areas with poor connectivity often face delays in dispatch even when administrative structures are present. This underlines the necessity of integrating ICT infrastructure development within health transport programs. Mlambo et al. (2022) argue that administrative effectiveness should not only consider human resources but also technological readiness including mobile networks, digital literacy of health workers, and equipment functionality.

Sunguya et al. (2024) identified several best practices from stakeholder interviews during the M-Mama scale-up: clear interdepartmental communication protocols, routine training for facility- and community-based actors, and real-time dashboards for monitoring dispatches. These measures substantially improved system responsiveness and community trust. The authors recommend a performance-based management approach for regional administrators to sustain high standards of coordination and reporting and advise embedding emergency-referral dashboards within national health information systems to institutionalize efficiencies and reduce reliance on paper records.

Mtwara is a rural, under-resourced region with fragile transportation, communication infrastructure, and administrative coordination. Implementing M-Mama in this setting provides an opportunity to examine how administrative factors shape the practical operation of a digital maternal emergency transport system. Research from similar regions indicates that without strong administrative coordination particularly in dispatch, facility readiness, and supervision the intended benefits of such systems are often compromised (Munishi et al., 2023). A focused study of administrative dynamics in Mtwara can help refine national policy and support effective scaling of emergency maternal transport programs.

1.1 Statement of the Problem

Although there are serious gains that have been made on the accessibility of maternal and emergency healthcare opportunities in Tanzania as facilitated by the M-Mama transport system, several weaknesses still dangle in the face of managing the system administratively. These problems including poor coordination between stakeholders, delays in delivery of the services and inefficiencies in the resources allocation processes undermine the potential of the system to be timely and effective in providing care in emergencies. These problems are especially acute in rural areas such as Mtwara, as the infrastructure and logistics of emergency healthcare are mostly absent. As past research revealed, although M-Mama has the potential to save lives, improper management and administrative failures may lead to delayed response and rise in costs, and missed chances to bring health outcomes (Njiro et al., 2023; Munishi et al., 2023).

Standardised procedures of operation and operational communication channels among the health facilities, drivers, and the local communities will be among some of the major barriers of administration or communication. It has been demographic that the irregularities in such processes may result in miscommunication, poor time in dispatching vehicles, and difficulties in urgently reaching patients (Njiro et al., 2023). People in Mtwara, where the healthcare

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facilities are usually not close to the populated centers, should focus especially on the need to organize and manage health care much better in order to provide the patients with the necessary medical assistance in time. Despite the success of M-Mama in maternal mortality reduction, the administrative loopholes restrict its success in attaining the more general health outcomes Onyango et al., 2022).

In addition, little is known about the administrative performance of the M-Mama system in particular to Lindi, Tanzania. A majority wishing to study the M-Mama system did so with the focus on the operational implications of the system, and few have engaged with the side of the administrative mechanisms underlying the system. Consequently, little substantial knowledge is understood regarding the factors that will rend the system administratively successful or rather unsuccessful in this case. This research intended to plug that gap and evaluate the administrative efficiency of the M-Mama transport system in Lindi, list the main administrative bottlenecks, and propose suggestions to enhance the management of the system and its overall effect on the emergency health operations (Yawson et al., 2022).

1.2 Research Objective

The study aims to assess the administrative effectiveness of the M-mama emergency transport system in Mtwara Region, Tanzania

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Health Systems Theory

The Health Systems Theory is used to explain all the dynamics and the structures of health systems and how they are key in offering health care services in a more effective manner. It is concerned with the different aspects of healthcare, including the organization of healthcare, funding, courtesy, and delivery of services and their interaction to attain health goals (Wang et al., 2021). The theory highlights the importance of coordination and integration of these elements to make sure that the healthcare systems become efficient and responsive to the needs of the population. The health systems theory is especially applicable in emergency health services including M-Mama transport system since timely delivery of the service is crucial in reducing the morbidity and mortality rates.

Assumptions: According to Health Systems Theory, the proper working healthcare system is that which incorporates various elements that include service delivery, leadership, and financing, as well as community participation, to facilitate quality and responsive healthcare. It states that these pieces have to fall into place so that the health system can work precisely and can fit the needs of the population (Sullivan et al., 2020). The theory also presupposes that the health systems need to be flexible to the changing situations, including emergencies and that proper management of resources and services are paramount in enhancing the health outcomes. Given a scenario of emergency transport systems, this theory implies that dispatch centers, transport services, and healthcare providers, in order to provide efficient service delivery, should be coordinated.

Relevance: An understanding of the Health Systems Theory lends a lot to the current research particularly in gaining an understanding on how the emergency health transport systems can be operated and how it can be administered in this case the M-Mama system. It underlines the role of coordination, administrative effectiveness, and resource factors that lie in the core of the M-Mama dispatch center operation. Using the Health Systems Theory, this research will conduct an examination of the extent to which the M-Mama system has been able to combine different components including technology, dispatch coordination, community awareness, and transport logistics to deliver timely emergency services. In addition, the concern with the organizational structure of how healthcare is delivered as part of the theory allows to comprehend how administrative issues and wastefulness within the healthcare delivery system may be alleviated.

Weaknesses: Even though it is obviously relevant, the Health Systems Theory has certain limitations when it is to be applied to particular health interventions under resource-limited conditions. Firstly, the theory assumes a perfect health system that resources are properly distributed and controlled which might not exactly happen in most low-income or rural area, like Mtwara region. The integration and coordination focus on the theory of the disease could ignore the local conditions regarding an inadequate infrastructure, logistical difficulties, and underfunded health systems, which is widespread in Tanzania and other such settings. Also, the theory might not be able to explain all barriers cultural and societal that can determine the acceptance and use of emergency transport systems in some communities.

Strengths: Among the most significant strengths of the Health systems theory, one must mention the comprehensively of its perspective on health systems provided as the interconnected elements. Such a systems thinking is of great use in the case of the M-Mama transport system analysis because it emphasizes the synergistic action of many factors, including efficiency of the dispatch centers, the ability of people to use the transport services, and the role of the community in providing effective healthcare services. The theory is also able to give a clear guideline on how the administration systems and management of resources can affect the success of operational systems of providing

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emergency transports. Health Systems Theory brings valuable advice about the benefits of coordination and integration and areas of improvement that can enhance administrative effectiveness and operational efficiency of such systems as M-Mama in rural areas (Sullivan et al., 2020).

2.2 Empirical Review

Several empirical studies show that emergency transport systems can improve maternal health outcomes in low- and middle-income countries. For example, Ehiri et al. (2018) reviewed emergency transportation interventions and found that timely transport substantially reduces adverse pregnancy outcomes in resource-constrained settings, highlighting the value of structured referral systems. Montagu et al. (2017) similarly reported that community-based transport models increase the likelihood that women reach health facilities for childbirth, which helps prevent avoidable maternal and neonatal deaths.

In Tanzania, evidence from Shinyanga suggests similar benefits. Munishi et al. (2023) found that the M-Mama community-based transport initiative reduced delays in accessing care during obstetric emergencies, crediting community involvement and mobile-phone dispatch systems for much of its success. Njiro et al. (2023) noted that the program's sustainability depends on administrative support, cross-sector collaboration, and integration with existing health structures. At the same time, Sanga et al. (2025) cautioned that scaling up remains difficult where funding is limited, infrastructure is poor, and administrative coordination is inconsistent.

Research from other sub-Saharan African countries echoes these challenges. Ifeanyichi et al. (2021), studying ambulance referrals across Tanzania, Malawi, and Zambia, observed that financial barriers and weak communication between dispatch teams and health facilities reduce referral efficiency. Banke-Thomas et al. (2024) highlighted that geographic inaccessibility and travel time are major constraints on maternal survival, and the Urban Birth Collective (2025) pointed out that poor mobile connectivity and weak ICT infrastructure often delay dispatch decisions in rural areas.

Technological readiness matters. Mlambo et al. (2022) argued that ICT can strengthen coordination in maternal health systems, provided health workers have the necessary digital skills and reliable networks. Sunguya et al. (2024) found that regions with real-time digital dashboards and regular staff training saw faster response times and greater community trust. Conversely, Onyango et al. (2022) reported that mobile health innovations in rural Tanzania were undermined by limited supervision, weak feedback loops, and inadequate community sensitization, reducing their long-term impact.

Administrative capacity is equally important. Mehmood et al. (2018) showed that pre-hospital emergency systems often underperform in low-income settings because of limited workforce capacity and poor coordination among stakeholders. Yawson et al. (2022) argued that weak administrative frameworks within M-Mama operations in rural Tanzania impede efficient referrals and recommended clearer communication protocols and more investment in staff training. Without routine supervision and capacity building, dispatch centers face bottlenecks that undermine maternal outcomes.

Overall, these studies suggest that community-based emergency transport programs like M-Mama have real potential to reduce maternal mortality, but their success hinges on administrative capacity, ICT infrastructure, and reliable road networks. Sustainable improvements will require a holistic approach that combines infrastructure investment, administrative reform, and active community engagement.

III. METHODOLOGY

3.1 Study Area

The research was undertaken in Tanzania, particularly Mtwara region where the M-Mama emergency transport system is in active implementation processes. This site has been selected because it is a rural site, which is characterized by less availability of healthcare infrastructure and it offers a good case to assess the effectiveness of emergency transport system against the difficulties that are unique in its healthcare delivery mode such as poor road infrastructure and inability to access timely healthcare services. The opportunity to study the M-Mama system in the given context has given significant insights as to how the emergency transport systems may be optimized in order to enhance delivery of health care in the underserved regions, and the results are likely to be applied more widely in other rural areas of Tanzania.

3.2 Research Design

The survey research design was used. To evaluate the efficiency of the M -Mama operating process, survey research was conducted which took into consideration such indicators as the time of reaction and the success of emergency transportation. This layout made it very easy to outline the status quo of the system in Mtwara. As Saunders

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et al. (2019) assert, the given design gives the depth to the analysis revealing not only what happens, but also the reasons behind what happens to the operational results of the M-Mama system.

3.3 Target Population

The population under study is selected precisely out of Mtwara region and it has 123 members directly up to date with the M-Mama system. That population will consist of 45 people within the community, 35 people in healthcare workers, and 43 members of administration. By targeting this group the study got the view of the two groups i.e. the service users as well as the group that handles and gives the service. Tashakkori and Teddlie (2010) note that inclusion of various stakeholders is essential in offering a grainy account on how emergency transport systems work in reality. The contribution of a wide range of participants guarantees the inclusion of a general variety of experiences, providing a more comprehensive understanding of factors that contributed to the system success or failure.

3.4 Sampling Procedure and Sample Size

The sampling procedures for this study combined purposive and random sampling techniques. Purposive participants were selected through sampling and predominantly include the direct target group of healthcare workers, dispatch workers, and the community leadership that is most directly involved with M-Mama system. The approach is suitable because it is used to obtain information about those who have adequate knowledge or experience of the research goals so that the information gathered becomes meaningful and relevant (Patton, 2015). Also, random sampling was used to identify the members of the communities who have used the M-Mama system so that the sample will represent the larger population of the communities. By using both approaches, the research is going to guarantee the diverse, but focused sample that will enable providing the more detailed analysis of M-Mama system.

Obtained through Yamane formula, the sample of 62 respondents is statistically sufficient so that the findings are representative of the population but the margin of error is reasonable. This sample is powerful enough to lead to valid answers in terms of determining the effectiveness of the M-Mama system and the elements which affect the operational success of the M-Mama system with the levels of confidence and margin of error, which are 91 percent and 9 percent respectively. With the sample size of 62, not only the study would be cost-effective but the qualitative and quantitative data would be thoroughly analyzed, making it possible to draw more general conclusions, and at the same time, not make the study too large in order not to overburden it (Krejcie & Morgan, 1970). The formula used is Yamane (1967) and this is explained with a level of confidence of 91 and 9 percent (1-0.09) and formula is expressed as hereunder;

$$n = \frac{N}{1 + N(e^2)}$$

Where: n= is number of sample (required)

N = Total population (123) and

e = Error tolerance (level) or margin of error (0.09)

$123/ (1+123(0.09)^2) = 123/1.9963= 62$

In that regard, the study sample size of the study was 62 respondents

3.5 Data Collection Instruments and Procedures

Creswell (2014) defines data collection instruments as the specific tools or strategies that researchers use to collect data from participants in a study. These instruments help researchers gather information that is relevant to their research questions and objectives. This study used questionnaires and interviews as data collection tools.

3.6 Reliability and Validity

The researcher's conclusions must therefore be trustworthy and legitimate. Any researcher seeking high-quality research should take validity and reliability into account while planning a study interpreting the findings, and presenting the findings. This study achieved validity in a number of ways. First, it involved carefully crafting questions and pre-testing questionnaires to ensure that they are understandable and those potential issues are detected early on, allowing for the easy identification of remedies. Second, in order to find and fix mistakes and omissions made during data recording, the gathered data was edited. The goal is to achieve accuracy, consistency, and completeness. A sufficient number of questions were created and formulated by the researcher for this study and questionnaires were used to gather data from a variety of respondents. But the purpose of the reconnaissance was to test the equipment.

3.7 Data Analysis

Data processing and analysis for this study was carried out using both manual and statistical software techniques. Quantitative data from surveys were analyzed using SPSS software to compute descriptive statistics, such as means,

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percentages, and frequencies, to summarize the community's perceptions and the operational efficiency of the M-Mama system. Qualitative data from interviews were analyzed thematically, following the steps outlined by Braun and Clarke (2006). This approach helped in identifying key themes and patterns in the data that align with the research objectives. The combination of statistical and thematic analysis allowed for a robust interpretation of both objective and subjective data, offering a comprehensive understanding of the research questions.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study targeted a total of 62 respondents from different stakeholder groups involved in the M-Mama system. Out of these, 59 questionnaires were returned, resulting in a response rate of 95.16%, which is considered satisfactory for this study. Table 4.1 presents the distribution of expected and actual respondents by category.

Table 1

Response Rate

Categories of Respondents	Expected Sample Size	Actual Sample Size	Response Rate (%)
Community Members	18	17	94.44
Healthcare Workers	14	14	100.00
Administrative Staff	17	15	88.24
Total	**62**	**59**	**95.16**

The high response rate ensures the reliability of the data collected and supports valid conclusions for the study. Moreover, it increase the possibility that survey findings may be generalized to the population studied and decrease the risk of response bias by lowering the possibility for distinctions among participants and non-respondents. Data gathered from interviews has been assessed, qualitatively summarized, and interpreted by combining it with quantitative statistics.

4.2 Operational Efficiency of the M-Mama Dispatch Center

The first objective of this study was to evaluate the operational efficiency of the M-Mama dispatch center in coordinating emergency transport in Mtwara Region. To achieve this objective, the study focused on six key indicators: community awareness, understanding of services, knowledge among pregnant women, frequency of awareness campaigns, adequacy of sensitization efforts, and effectiveness of community education regarding emergency maternal transport services. The responses were collected from 55 participants and analyzed as shown in the table below.

Table 2

Community Awareness and Administrative Effectiveness

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Total
Community members are well-informed about how the M-Mama emergency transport system operates.	7 (12.7%)	8 (14.5%)	5 (9.1%)	20 (36.4%)	15 (27.3%)	55 (100%)
The level of understanding of M-Mama services among community members is satisfactory.	6 (10.9%)	9 (16.4%)	4 (7.3%)	25 (45.5%)	11 (20.0%)	55 (100%)
Most pregnant women in remote areas know when and how to access M-Mama services.	4 (7.3%)	11 (20.0%)	6 (10.9%)	22 (40.0%)	12 (21.8%)	55 (100%)
M-Mama conducts regular public awareness campaigns on emergency health services.	8 (14.5%)	9 (16.4%)	5 (9.1%)	23 (41.8%)	10 (18.2%)	55 (100%)
The frequency of sensitisation efforts about the M-Mama system is adequate.	6 (10.9%)	13 (23.6%)	3 (5.5%)	23 (41.8%)	10 (18.2%)	55 (100%)
Community education on emergency maternal transport services is effectively delivered.	4 (7.3%)	8 (14.5%)	5 (9.1%)	27 (49.1%)	11 (20.0%)	55 (100%)

The findings reveal that 36.4% of respondents agreed and 27.3% strongly agreed that community members are well-informed about the operations of the M-Mama emergency transport system. However, 12.7% strongly disagreed and 14.5% disagreed, indicating a significant minority still lacks full awareness. This suggests that while the majority recognizes a satisfactory level of awareness, there remain notable gaps, particularly in marginalized and remote areas. Qualitative data from interviews supports this observation, with one participant noting:

> *"Most people are aware of the M-Mama programme, but there are still some remote villages that have not received enough education."*(Interview Guide, 2025)

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These findings highlight uneven awareness of M-Mama services and the difficulty of reaching remote communities. When asked whether the level of understanding of M-Mama services was satisfactory, 45.5% agreed and 20.0% strongly agreed, while 10.9% strongly disagreed and 16.4% disagreed. In other words, a clear majority grasp the services offered, but a meaningful minority do not. Among pregnant women in remote areas, 40.0% agreed and 21.8% strongly agreed that they knew when and how to access M-Mama services; 7.3% strongly disagreed and 20.0% disagreed. These results show generally positive awareness but also a substantial information gap that calls for targeted sensitization efforts (Njiro et al., 2023).

Perceptions of public awareness campaigns were mixed: 41.8% agreed and 18.2% strongly agreed that campaigns are run regularly, while 14.5% strongly disagreed and 16.4% disagreed. Although radio and community meetings reach many people, consistent coverage of remote locations remains a challenge (Bittaye et al., 2023). Similarly, respondents' views on the adequacy of sensitization were divided: 41.8% agreed and 18.2% strongly agreed it is adequate, yet 10.9% strongly disagreed and 23.6% disagreed. This again points to important gaps particularly among hard-to-reach groups despite generally positive assessments. When asked about the effectiveness of community education, 49.1% agreed and 20.0% strongly agreed that efforts are impactful; 7.3% strongly disagreed and 14.5% disagreed. While many feel education is working, the dissenting responses suggest there is room to improve reach and engagement.

A traditional birth attendant elaborated:

> *"People now understand the importance of M-Mama after receiving education, but there are still men who do not see the value of taking their wives to hospital on time."* (Interview Guide, 2025)

Another Community Health Worker insisted,

> *"From my perspective on the ground, the M-Mama Dispatch Center has brought significant improvements in emergency maternal care awareness. Pregnant women are beginning to understand that help is available when complications arise, although this knowledge is still uneven across remote areas. We conduct awareness campaigns in the community, but they are not as frequent as they should be perhaps once every two months. Given the critical nature of maternal health, these sensitization efforts need to be more regular and include follow-up visits. Many women I interact with know about M-Mama, but they don't always understand exactly how or when to access it. Education materials are available, but language and literacy barriers limit their effectiveness. Overall, the dispatch center is effective, but without consistent and well-funded community education, its potential is not fully realized."*

This signifies the twofold character that the successful education campaigns have brought: there is more awareness, but the cultural barriers are still an issue to reckon with (Mehmood et al., 2018). All in all, the above results suggest that the situation with the community awareness and understanding of the M-Mama emergency transport system is rather favorable yet not universal. The problem is that the rural and disadvantaged communities remain less informed, and it shines the light on the existing disparities in accessing information. The results are consistent with those that earlier investigations pointed out noting that health education and awareness campaigns tend to lack equity in its delivery in geographically and socially disadvantaged areas (Sunguya et al., 2024). The resultant implication here is an obvious requirement of increased, culturally-sensitive and geographically-inclusive sensitization activities so that the entire community (as in, not just those in the urban centers) has access to timely and correct information about M-Mama services.

Summing up, although significant success has been registered so far to spread the information and educate people on using M-Mama emergency transport system, special work needs to be continued and improved in the identified areas of concern. This is likely to enhance knowledge, as well as facilitate the breaking of socio-cultural barriers that hinder access to emergency services in a timely manner to contribute to improved maternal health outcome.

4.3 Factors Affecting Community Utilization of the M-Mama Emergency Transport Services

The second objective of this study was to investigate factors affecting community utilization of the M-Mama emergency transport services in Mtwara Region. To achieve this, the study focused on six key indicators: poor road infrastructure, availability of reliable road networks, delays caused by impassable roads during emergencies, availability of functional communication equipment at M-Mama dispatch points, the role of mobile phone connectivity in timely coordination of emergency maternal transport, and the impact of lack of communication equipment on response time. Responses were collected from 55 participants and analyzed as shown in the table below.

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Table 3

Factors Affecting Community Utilization of m-mama

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Total
Poor road infrastructure limits access to M-Mama emergency transport services in remote areas.	3 (5.5%)	6 (10.9%)	5 (9.1%)	25 (45.5%)	16 (29.1%)	55 (100%)
Availability of reliable road networks enhances the effectiveness of the M-Mama emergency response.	2 (3.6%)	4 (7.3%)	7 (12.7%)	28 (50.9%)	14 (25.5%)	55 (100%)
Most rural communities in Mtwara experience delays due to impassable roads during emergencies.	4 (7.3%)	7 (12.7%)	5 (9.1%)	26 (47.3%)	13 (23.6%)	55 (100%)
Functional communication equipment is available at most M-Mama dispatch points.	3 (5.5%)	8 (14.5%)	6 (10.9%)	24 (43.6%)	14 (25.5%)	55 (100%)
Mobile phone connectivity helps in the timely coordination of emergency maternal transport.	1 (1.8%)	4 (7.3%)	5 (9.1%)	29 (52.7%)	16 (29.1%)	55 (100%)
Lack of communication equipment affects the response time of M-Mama emergency services.	2 (3.6%)	7 (12.7%)	6 (10.9%)	26 (47.3%)	14 (25.5%)	55 (100%)

The findings show that most respondents view poor road infrastructure as a major barrier to accessing M-Mama emergency transport in remote areas: 25 (45.5%) agreed and 16 (29.1%) strongly agreed. A smaller number disagreed (3, 5.5% strongly disagreed; 6, 10.9% disagreed) and 5 (9.1%) were neutral. This suggests that terrain and underdeveloped roads substantially hinder emergency vehicles from reaching patients quickly, especially during the rainy season when unpaved routes become impassable (Munishi et al., 2023).

On the positive side, many respondents believe that reliable road networks improve M-Mama's effectiveness: 28 (50.9%) agreed and 14 (25.5%) strongly agreed. Only a few respondents disagreed (2, 3.6% strongly disagreed; 4, 7.3% disagreed) and 7 (12.7%) were neutral. These results highlight how road accessibility not only shortens travel times for ambulances or community taxis but also improves safety during transport, consistent with findings that better transport networks are linked to lower maternal mortality in sub-Saharan Africa.

Respondents also reported frequent delays caused by impassable roads in rural Mtwara: 26 (47.3%) agreed and 13 (23.6%) strongly agreed that such delays are common. A minority disagreed (4, 7.3% strongly disagreed; 7, 12.7% disagreed) and 5 (9.1%) were neutral. These responses reinforce that transportation barriers involve not just availability but also reliability; poor roads can cause delays that are dangerous during obstetric emergencies (Kihwele et al., 2022).

Regarding communication at M-Mama dispatch points, 24 (43.6%) respondents agreed and 14 (25.5%) strongly agreed that functional equipment is available. However, 3 (5.5%) strongly disagreed and 8 (14.5%) disagreed, indicating persistent communication gaps. Because timely dispatch depends on effective two-way communication, any shortfalls in equipment can jeopardize service delivery.

Mobile phone connectivity was widely seen as critical: 29 (52.7%) agreed and 16 (29.1%) strongly agreed that it plays a key role in timely maternal transport. Only 1 (1.8%) strongly disagreed, 4 (7.3%) disagreed, and 5 (9.1%) were neutral. These results underline the growing importance of mobile technology in settings with limited physical infrastructure: phones enable rapid alerts, faster decision-making, and better coordination among communities, dispatchers, and health workers, thereby reducing the "second delay" in emergency response.

Finally, most respondents (26, 47.3% agreed; 14, 25.5% strongly agreed) reported that a lack of communication equipment slows response times. A few disagreed (2, 3.6% strongly disagreed; 7, 12.7% disagreed) and 6 (10.9%) were neutral. Overall, inadequate communication infrastructure appears to create time lapses in dispatch and response procedures that directly affect service efficiency and patient outcomes.

In an interview, one respondent said:

> *"One major barrier to the community's full utilization of M-Mama services is poor road infrastructure. Many areas become inaccessible during the rainy season, and emergency vehicles cannot reach women in need quickly. Mobile phone connectivity is another big issue. In many rural regions, network coverage is patchy, and people struggle to call the dispatch center. Even when they reach out, there's often a lack of reliable or functional communication equipment, particularly in smaller health outposts. We've tried to provide radios or alternative communication tools, but budget limitations prevent full coverage. These infrastructure and technology gaps undermine an otherwise promising program. To truly empower communities to use M-Mama, we need cross-sector collaboration to improve roads and digital access."*

The findings reveal that road infrastructure and communication tools are critical elements influencing the accessibility and effectiveness of the M-Mama emergency transport service. The barriers identified namely, poor road conditions and inadequate communication systems mirror broader structural challenges documented in the literature.

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4.4 Administrative Challenges in the Implementation of the M-Mama Emergency Transport System

The third objective of this study was to identify administrative challenges within the M-Mama emergency transport system implementation in Mtwara Region. To achieve this objective, the study examined six key factors: clarity and efficiency of coordination between healthcare facilities and the M-Mama dispatch centre, delays in communication affecting timely responses, regular updates from healthcare facilities to the dispatch centre, adequacy of staffing and training at the dispatch team, the impact of lack of trained staff on emergency response effectiveness, and availability of training opportunities for dispatch staff. Responses were collected from 55 participants and analysed as shown in the table below.

Table 4

Administrative Challenges

Statement	SD (1)	D (2)	N (3)	A (4)	SA (5)	Total
Coordination between healthcare facilities and the M-Mama dispatch centre is clear and efficient.	4 (7.3%)	5 (9.1%)	6 (10.9%)	25 (45.5%)	15 (27.3%)	55 (100%)
Delays in communication between health facilities and dispatch centres affect timely response.	3 (5.5%)	6 (10.9%)	5 (9.1%)	26 (47.3%)	15 (27.3%)	55 (100%)
Healthcare facilities regularly update the dispatch centre with emergency needs.	5 (9.1%)	7 (12.7%)	8 (14.5%)	20 (36.4%)	15 (27.3%)	55 (100%)
The dispatch team is adequately staffed with trained personnel to handle emergency calls.	6 (10.9%)	8 (14.5%)	7 (12.7%)	18 (32.7%)	16 (29.1%)	55 (100%)
Lack of trained staff in dispatch centres hinders the effectiveness of emergency responses.	4 (7.3%)	5 (9.1%)	6 (10.9%)	21 (38.2%)	19 (34.5%)	55 (100%)
Training opportunities are available for staff working in M-Mama dispatch operations.	7 (12.7%)	9 (16.4%)	5 (9.1%)	19 (34.5%)	15 (27.3%)	55 (100%)

Most respondents felt that coordination between healthcare facilities and the M-Mama dispatch center is generally clear and efficient: 25 (45.5%) agreed and 15 (27.3%) strongly agreed. However, a notable minority disagreed (4, 7.3% strongly disagreed; 5, 9.1% disagreed) and 6 (10.9%) were neutral. These results suggest that while coordination works for many, there are still operational gaps that could hinder emergency response. Kruk et al. (2018) emphasize that well-structured interfacility coordination is essential for timely maternal emergency transport, especially in decentralized systems like Tanzania's.

Delays in communication between health facilities and dispatch centers were widely seen as affecting timely responses: 26 (47.3%) agreed and 15 (27.3%) strongly agreed. A smaller group disagreed (3, 5.5% strongly disagreed; 6, 10.9% disagreed) and 5 (9.1%) were neutral. These findings point to communication bottlenecks that undermine the M-Mama response, consistent with Njiro et al. (2023), who linked similar delays in southern Tanzania to the absence of real-time tools and weak information-sharing protocols problems that are worse in remote facilities with unreliable mobile networks.

When asked whether facilities regularly update the dispatch center about emergency needs, responses were mixed: 20 (36.4%) agreed and 15 (27.3%) strongly agreed, while 5 (9.1%) strongly disagreed, 7 (12.7%) disagreed, and 8 (14.5%) were neutral. This inconsistency in information flow makes it harder for dispatch teams to anticipate demand and allocate vehicles. Onyango et al. (2022) note that weak feedback loops between dispatch centers and peripheral units often lead to misallocated resources and referral delays.

Respondents were somewhat positive about staffing and training in the dispatch team: 18 (32.7%) agreed and 16 (29.1%) strongly agreed that staffing and training were adequate. Still, 6 (10.9%) strongly disagreed, 8 (14.5%) disagreed, and 7 (12.7%) were neutral, suggesting uneven staffing levels or differences in perceived competency across locations. Bittaye et al. (2023) found that insufficient training and limited technical skills among emergency teams are common barriers to effective service delivery in low-resource settings.

On whether a lack of trained staff hinders emergency response, most respondents agreed: 21 (38.2%) agreed and 19 (34.5%) strongly agreed. A minority disagreed (4, 7.3% strongly disagreed; 5, 9.1% disagreed) and 6 (10.9%) were neutral. These results reinforce that inadequate training undermines the quality and timeliness of emergency care.

Taken together, the survey data indicate that coordination, timely communication, and consistent staffing/training are critical to M-Mama's effectiveness. While many participants see these elements working well, the persistent disagreements and neutral responses highlight areas for operational improvement especially strengthening real-time communication tools, standardizing update practices, and investing in dispatch training and supervision.

In support, an interview with a nurse from a rural health center in Masasi District revealed:

> *"Sometimes the dispatch centre takes too long to respond because the person receiving the call does not understand the urgency. I believe more training is needed to help them prioritize cases quickly."* (Interview Guide, 2025)

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Another one added,

> *"From an administrative standpoint, one recurring issue is the lack of timely updates from healthcare facilities regarding their capacity and readiness to receive emergency referrals. This affects dispatch decisions and can result in delays or misrouting of transport. Another challenge is the shortage of trained staff familiar with emergency maternal protocols and the M-Mama system. Without proper training, even equipped facilities fail to provide the needed support when women arrive. Coordination between the dispatch center and the healthcare facilities is also not always clear; there are instances where responsibilities overlap or are misunderstood. We lack a unified communication protocol, and this sometimes creates confusion in high-pressure situations. Investing in digital tracking systems and routine administrative training would significantly enhance implementation. In sum, while M-Mama is a transformative initiative, its success depends on robust, synchronized administration at all levels."*

Finally, regarding the availability of training opportunities for staff working in M-Mama dispatch operations, 19 (34.5%) respondents agreed and 15 (27.3%) strongly agreed. Nevertheless, 7 (12.7%) strongly disagreed, 9 (16.4%) disagreed, and 5 (9.1%) were neutral. The data imply a shortfall in continuous professional development opportunities. Without regular refresher courses, staff may struggle to keep up with evolving procedures and technologies, thereby undermining programme effectiveness.

The results highlight critical administrative and operational challenges affecting the implementation of M-Mama emergency transport services in the Mtwara Region. These include communication delays, inconsistencies in coordination practices, insufficient staffing, and inadequate training opportunities.

4.2 Discussion

4.2.1 The Operational Efficiency of the M-Mama Dispatch Centre

The investigation found a strong positive correlation between the efficiency of the M-Mama emergency transport system and both community use ($r = 0.763$, $p < 0.01$) and fewer administrative obstacles ($r = 0.701$, $p < 0.01$). In other words, greater community awareness and active engagement, together with smoother administrative processes, meaningfully improve dispatch-center performance.

When community members respond quickly, reporting is faster and transport resources are deployed sooner. Administrative improvements such as quicker fund release and fewer bureaucratic hurdles give the dispatch center more autonomy and improve coordination with health staff and transport providers during emergencies.

Most respondents had more than six years of experience and represented a range of roles, including community members, healthcare workers, and administrators. This mix of perspectives supports better decision-making and clearer distribution of tasks.

These findings are supported by previous work: Kruk et al. (2018) and Sullivan et al. (2020) highlight that coordination, resource allocation, and inclusive teams are essential for effective health operations. The value of community-based transport systems for maternal health in rural areas, which aligns with the Mtwara results. Wang et al. (2021) also argue that balancing infrastructure improvements with efforts to build community trust for example through awareness campaigns and administrative reform increases system efficiency.

Overall, the results indicate that M-Mama's effectiveness depends on both active community participation and well-functioning internal systems. Together these factors create a positive feedback loop that strengthens maternal and newborn health outcomes.

4.2.2 Factors affecting Community in the Utilisation of the M-Mama Emergency Transport System in Mtwara Region

The study confirmed a significant correlation between community utilization and operational efficiency amid administrative challenges ($r = 0.652$, $p < 0.01$), emphasizing the critical role of administrative performance in shaping public trust and service usage in the M-Mama emergency transport system. Key factors such as timely responses, strong coordination, and clear communication directly influence community confidence. When these systems function effectively, they foster reliability and engagement. In contrast, delays and disorganized responses lead to reduced trust and underutilization of services, even during emergencies. Administrative functionality is therefore not merely supportive but central to the effectiveness and perceived dependability of M-Mama.

Beyond technical availability, the paper shows that the operational configuration how calls are responded to, how quickly help arrives, and how well transport and health services coordinate determines system impact. Effective communication within and outside the system builds awareness, offers feedback channels, and enhances community cooperation. Additionally, administrative capacity-building through staff training, evaluation, and technology adoption is essential in making the system transparent, fast, and adaptable. Findings from Mlambo et al. (2022) reinforce that issues like low awareness, poor dispatch coordination, and resource shortages, rather than educational barriers, are the primary limitations in low-resource settings like Mtwara.

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Demographic insights reveal that while the community respondents (28.8%) highlighted grassroots challenges like lack of awareness and slow responses, 89% of participants had at least a diploma, suggesting operational not educational barriers. Literature from Sunguya et al. (2024) consistently highlights that administrative responsiveness, transparency, and follow-up mechanisms are vital for public confidence in emergency transport systems. Overall, this study underscores a two-pronged approach: improving internal administrative systems and simultaneously engaging the community through education and outreach. Together, these efforts enhance both service utilization and the broader maternal health outcomes in the region.

4.2.3 The Administrative Challenges within the M-Mama Emergency Transport System Implementation in Mtwara Region

The results show a strong positive correlation between administrative challenges and both community utilization ($r = 0.652$, $p < 0.01$) and operational efficiency ($r = 0.701$, $p < 0.01$). This suggests that system-level inefficiencies are a major barrier to the performance of the M-Mama emergency transport service. Administrative delays, rigid procedures, and limited local decision-making authority slow emergency responses delays that can be life-threatening in maternal emergencies. Poor coordination among health workers, transport providers, and local authorities also contributes to dispatch delays, undermining the M-Mama model's reliance on smooth collaboration.

These findings are consistent with Larson et al. (2019), who reported that decentralized emergency systems in Tanzania often face bureaucratic and logistical hurdles. In our study, 22% of managerial respondents highlighted poor supervision, communication gaps, and resource mismanagement. Experienced staff—39% of respondents had more than 11 years of service echoed these concerns and pointed to entrenched structural problems. Supporting literature from Njiro et al. (2023) similarly identifies weak administrative frameworks and fragmented leadership as key obstacles to timely, reliable emergency responses.

Other regional studies reinforce these themes. Mlambo et al. (2022) and several analyses of East African emergency health systems note that inadequate administrative planning, limited stakeholder engagement, and logistical disorganization regularly disrupt service delivery. The relatively high correlation values reported here underscore the need for administrative reforms to improve maternal and newborn outcomes.

To address these gaps, the evidence suggests prioritizing clearer communication channels, stronger accountability mechanisms, and targeted capacity building. Practical steps include standardizing rapid-response procedures, delegating decision authority where appropriate, and improving supervision and resource tracking. Strengthening coordination protocols among dispatch centers, health facilities, and transport providers paired with routine training and performance monitoring can reduce response times and improve care quality.

Ultimately, improving the administrative backbone of the M-Mama system is essential for translating community engagement into effective, timely emergency transport. By combining operational reforms with better stakeholder coordination, the M-Mama program can become more reliable and more effective at saving maternal and newborn lives in Mtwara.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

On the basis of the findings, the study deduces that a number of interrelated elements greatly undermine the successful implementation and application of the M-Mama emergency transport system in Mtwara Region. Inefficient road networks especially in villages that are not easily accessible causes an extreme shortage of effective transportation to emergency maternal care, and it causes its share of critical delays and in many instances, poor maternal and neonatal wellbeing. Also, the existence and operability of communications systems, such as mobile network access and radio devices, were deemed crucial in supporting the coordination and responsiveness of emergency services. Nonetheless, in the study, it was found that there are poor coordination mechanisms between healthcare facilities and the M-Mama dispatch centre that, along with delay of message exchange and an insufficiency of information flow, hinders the effectiveness of emergency response activities. In addition to that, the lack of available educated personnel and the lack of ongoing capacity-building programs with dispatchers became the major obstacles, interfering with the sustainability and the reliability of the functioning of the system. The findings support the criticality of multi-sectorial interventions that include infrastructural developments, technology, investment and strengthening of human resource to enhance the outcomes of maternal health by delivering the emergency transportation services in a more effective way.

5.2 Recommendations

To start with, it is of utmost importance to enhance the development of the road infrastructure in the remote and underserved regions. Poor and unadjusted roads are a major bridge in responding to the situation in time, in most cases, the reaching of health facilities is delayed during the obstetric emergencies. Funding into construction and development of rural road network would help to save time of transport and minimize the travel issues and eventually lead to the

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better maternal and neonatal outcomes.

Secondly, all the M-Mama dispatch centres and other related rural health facilities must be provided with working and dependable communication equipment. Emergency response can be fatally jeopardized by the communication errors between dispatchers, drivers, and the medical staff. Delivery of mobile communication gadgets, radios, and a stable source of internet to the centres will facilitate real-time coordination and curtail time lag when it comes to delivery of service.

Third, creating a uniform system of communication between the dispatch centres and the healthcare facilities is a prerequisite to efficient work. Information exchange, triage and case management are examples of uniform processes that can reduce errors, achieve consistency when delivering services and facilitate monitoring and evaluation of service outcome. Evidence-based protocols should be maintained on a regular basis to echo new best-practices.

REFERENCES

Banke-Thomas, A., Wong, K. L. M., Olubodun, T., Macharia, P. M., Sundararajan, N., & Shah, Y. (2024). Geographical accessibility to functional emergency obstetric care facilities in urban Nigeria using closer-to-reality travel time estimates: A population-based spatial analysis. *The Lancet Global Health, 12*(5), e848–e858. https://doi.org/10.1016/S2214-109X(24)00045-7

Bittaye, H., Mooney, J. P., Afferri, A., Balen, J., & Kay, V. (2023). Introducing assisted reproductive technologies in The Gambia: A survey on the perspectives of Gambian healthcare professionals and medical students. *BMC Health Services Research, 23*(1), 203. https://doi.org/10.1186/s12913-023-09171-7

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Ehiri, J., Alaofe, H., Asaolu, I., Chebet, J., Esu, E., & Meremikwu, M. (2018). Emergency transportation interventions for reducing adverse pregnancy outcomes in low- and middle-income countries: A systematic review protocol. *Systematic Reviews, 7*(1), 137. https://doi.org/10.1186/s13643-018-0729-2

Ifeanyichi, M., Broekhuizen, H., Cheelo, M., Juma, A., Mwapasa, G., & Borgstein, E. (2021). Surgical ambulance referrals in sub-Saharan Africa: Financial costs and coping strategies at district hospitals in Tanzania, Malawi and Zambia. *BMC Health Services Research, 21*(1), 679.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Kruk, M. E., Gage, A. D., Arsenault, C., Jordan, K., Leslie, H. H., & Roder-DeWan, S. (2018). High-quality health systems in the Sustainable Development Goals era: Time for a revolution. *The Lancet Global Health, 6*(11), e1196–e1252. https://doi.org/10.1016/S2214-109X(18)30386-3

Larson, E., Gage, A. D., Mbaruku, G. M., Mbatia, R., Haneuse, S., & Kruk, M. E. (2019). Effect of a maternal and newborn health system quality improvement project on the use of facilities for childbirth: A cluster-randomised study in rural Tanzania. *Tropical Medicine & International Health, 24*(5), 636–646. https://doi.org/10.1111/tmi.13220

Mehmood, A., Rowther, A. A., & Kobusingye, O. (2018). Assessment of pre-hospital emergency medical services in low-income settings using a health systems approach. *International Journal of Emergency Medicine, 11*(53), 1–8.

Mlambo, C., Sibanda, K., Ntshangase, B., & Mvuyana, B. (2022). ICT and women's health: An examination of the impact of ICT on maternal health in SADC states. *Healthcare, 10*(5), 802. https://doi.org/10.3390/healthcare10050802

Montagu, D., Sudhinaraset, M., Diamond-Smith, N., Campbell, O., Gabrysch, S., & Freedman, L. (2017). Where women go to deliver: Understanding the changing landscape of childbirth in Africa and Asia. *Health Policy and Planning, 32*(8), 1146–1152. https://doi.org/10.1093/heapol/czx060

Mooney, P., Cui, W., Guan, B., & Juhász, L. (2023). Towards understanding the geospatial skills: Taking a Geographic Information Systems (GIS) exam. *Proceedings of the ACM on Human-Computer Interaction, 7*(CSCW2), Article 316. https://doi.org/10.1145/3615886.3627745

Munishi, C., Mateshi, G., Mlunde, L. B., Njiro, B. J., Ngowi, J. E., Kengia, J. T., Kapologwe, N. A., Deng, L., Timbrell, A., Kitinya, W., Pembe, A. B., & Sunguya, B. F. (2023). Community-based transport system in Shinyanga, Tanzania: A local innovation averting delays to access health care for maternal emergencies. *PLOS Global Public Health, 3*(8), e0001487. https://doi.org/10.1371/journal.pgph.0001487

Njiro, B. J., Ngowi, J. E., Mlunde, L., Munishi, C., Kapologwe, N., Kengia, J. T., Deng, L., Timbrell, A., Kitinya, W. J., & Sunguya, B. F. (2023). Towards sustainable emergency transportation system for maternal and newborn:

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Lessons from the m-mama innovative pilot program in Shinyanga, Tanzania. *PLOS Global Public Health, 3*(6), e0002097. https://doi.org/10.1371/journal.pgph.0002097

Onyango, R., Akinmoladun, O., & Mwaura, M. (2022). Mobile health in rural areas: Evaluating the effectiveness of emergency transport systems in Tanzania. *Journal of Health Innovations, 13*(1), 23–39. https://doi.org/10.1016/j.jhi.2022.05.003

Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). SAGE Publications.

Sanga, A., Kibusi, S., & Kengia, J. T. (2025). The effectiveness of community engagement using M-Mama champions in improving awareness of obstetric danger signs, birth preparedness and complication readiness among pregnant women in Bahi, Dodoma: A cluster randomized pragmatic implementation trial. *PLOS Global Public Health, 5*(4), e0004315. https://doi.org/10.1371/journal.pgph.0004315

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Sullivan, P., McNally, M., & Thompson, R. (2020). Health systems theory and emergency health interventions. *Global Health Perspectives, 18*(3), 34–45.

Sunguya, B. F., Ngowi, J. E., Njiro, B. J., & Munishi, C. (2024). Scaling up an emergency transportation system: Stakeholder practices in Shinyanga. *BMJ Open, 14*(2), e073859. https://doi.org/10.1136/bmjopen-2023-073859

Tashakkori, A., & Teddlie, C. (2010). *Mixed methodology: Combining qualitative and quantitative approaches* (2nd ed.). SAGE Publications.

UrbanBirth Collective. (2025). Improving complex health systems and lived environments for maternal and perinatal well-being in urban sub-Saharan Africa: The UrbanBirth Collective. *Journal of Global Health, 15*, 03009. https://doi.org/10.7189/jogh.15.03009

Wang, L., Lee, M. Y., & Chang, H. L. (2021). Health systems theory and its application in emergency transport systems. *Health Care Management Review, 46*(2), 58–65. https://doi.org/10.1097/HMR.0000000000000299

World Health Organization. (2023). *Trends in maternal mortality 2000 to 2017: Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division*. World Health Organization. https://apps.who.int/iris/handle/10665/327595

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

Yawson, A., Mwaura, M., & Mutabazi, M. (2022). Enhancing the effectiveness of mHealth systems in rural healthcare delivery: A case study of M-Mama in Tanzania. *African Health Systems Review, 18*(3), 45–59. https://doi.org/10.1016/j.ahr.2022.02.007

Zachariah, R., Ford, N., Philips, M., & Lynch, S. (2009). Task shifting in HIV/AIDS: Opportunities and challenges. *Transactions of the Royal Society of Tropical Medicine and Hygiene, 103*(6), 549–558. https://doi.org/10.1016/j.trstmh.2008.09.019

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Promoting information systems interoperability in enhancing compliance with maritime transport rules and regulations in Tanzania

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ABSTRACT

This study was conducted to investigate how information systems interoperability can enhance maritime transport compliance monitoring and evaluation in Tanzania, specifically to identify the challenges posed by non-interoperable information systems and to investigate the barriers to achieving interoperability in maritime transport compliance monitoring and evaluation. The Responsive Regulation Theory and the Socio-Economic Theory of Regulatory Compliance guided this research. The study employed a convergent or concurrent design using a mixed-methods approach (qualitative and quantitative research approaches). Simple random sampling was utilized to select 171 respondents using Yamane's formula for the quantitative component and eleven (11) participants through the purposive sampling technique for the qualitative component. The population comprised 300 individuals from Tanzania Shipping Agencies Corporation (TASAC) as the maritime transport regulator authority and regulated entities, from which, out of the 171 questionnaires issued, 160 were returned, resulting in a response rate of 93 percent, and based on data saturation and consultation with experts, in-depth semi-structured interviews with eleven (11) TASAC employees and compliance officers from regulated entities were used to collect qualitative data. Data were collected through questionnaires, interviews, and document analysis and analyzed using thematic analysis, descriptive analysis, and inferential analysis through ordered logistic regression. Delays in data retrieval, inconsistencies and inaccuracies across information sources, and inefficiencies in compliance reporting are among the critical challenges identified due to non-interoperable information systems. Furthermore, barriers such as information security risks, institutional information system fragmentation, and a lack of harmonized standards were found to significantly hinder the achievement of interoperability. The findings provide valuable insights for the Tanzania Maritime Regulatory Authority (TASAC), policymakers, and industry stakeholders on the need to have collaborative efforts for fostering secure, transparent, and efficient maritime operations through regulatory frameworks alignment, standardizing reporting procedures, integrating platforms such as the National Maritime Single Window (NMSW) and the Port Community System (PCS), and making governance structures more effective to ensure accountability and sustainability. By establishing an interconnected and secure digital environment, compliance monitoring and evaluation can become more efficient, transparent, and reliable.

Keywords: Compliance Monitoring, Evaluation, Information Systems Interoperability, Regulatory Service Delivery

I. INTRODUCTION

Regulations are rules not created explicitly by the parliament or the courts. When social, commercial, and political actors monitor and enforce these rules, it is considered regulation (Guidi et al., 2020). The regulatory system offered by governmental organizations and/or independent regulators comprises two fundamental elements, which are rulemaking and regulatory delivery (Mangalam, 2020). When the government provides services to businesses and individuals to ensure compliance with rules, this is termed regulatory service delivery. The key characteristics of good regulatory delivery are simplicity, efficiency, consistency, and transparency. Private companies mostly rely on the quality of regulatory service delivery to make investment decisions (Ali et al., 2019).

In the digital age, enhancing regulatory service delivery requires adopting artificial intelligence and other digital technologies. These tools can reduce burdens and protect the general public and consumers (Mangalam, 2020). A key enabler in this transformation is data sharing and interoperability among government agencies and stakeholders. When information can be directly obtained from stakeholders, repeated inspections and monitoring visits can be avoided, increasing operational efficiency (Organisation for Economic Co-operation and Development, 2014). Moreover, such data can support a variety of regulatory objectives when processed through modern analytics tools (Organisation for Economic Co-operation and Development, 2021).

However, the lack of interoperability between Information Technology (IT) Systems and software applications to communicate and exchange data accurately, effectively, and consistently poses risks for regulatory authorities like maritime transport regulatory authorities, as links between data fragments can be very difficult to identify (Jokhadze, 2020). Many legacy systems operated by Government departments in Tanzania, especially in the maritime industry, are

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proprietary and non-standard, which means they are not interoperable at the business processes level and forced to operate in silos, which hinders regulatory service delivery (President's Office Public Service Management and Good Governance, 2022).

While Interoperability offer a wide range of advantages to the maritime transport sector by improving the efficiency and productivity of port operations (Kahyarara & Simon, 2018).it has been shown that legislative barriers, incompatible business processes and information models, and the diversity of technologies used in the public sector are major barriers to exchanging information and collaborating electronically (European Union, 2017).In addition, issues of data standardization, cybersecurity, and stakeholder adoption continue to be major challenges in achieving interoperability (Esther et al., 2025).

Although Interoperability standards and Application Programming Interfaces are widely used, with some level of interoperability within public, but not between, public and private facilities (Ndlovu et al., 2021). It is revealed that there is an interoperability challenge in e-government implementation related to information systems (Ronoh et al., 2018). Being a smarter maritime transport regulatory authority requires a more forward-thinking approach to using and integrating information, technology, and innovation in governing and delivering services (Mangalam, 2020).In response, Tanzania's government has invested in ICT to provide services to citizens and reform the public sector by making government services easy to access. Nevertheless, some public institutions, including institutions in the maritime industry, face limited automation and an unintegrated service provisioning approach (President's Office Public Service Management and Good Governance, 2022). The current study aims to identify challenges arising from this unintegrated service provisioning approach and barriers to achieving integrated regulatory service provision in the Tanzania maritime industry.

1.1 Statement of the Problem

In fulfilling its mandate, the Tanzania Shipping Agencies Corporation (TASAC), a maritime transport regulatory authority in Tanzania, has introduced several information systems to streamline billing, licensing, and certification processes, aiming to reduce time and paperwork. However, these systems do not directly share data or interoperate with those of regulated service providers and other government agencies, resulting in limited real-time monitoring and inefficient compliance oversight (TASAC, 2021).The lack of interoperability has led to repetitive tasks, human errors, and delays in decision-making, thereby increasing operational costs for TASAC and its stakeholders. Consequently, TASAC faces challenges in promptly detecting and addressing regulatory issues. This study aims to identify the challenges arising from non-interoperable information systems and investigate obstacles to achieving effective interoperability in monitoring and evaluating compliance with maritime transport regulations.

1.2 Research Objective

i. The study focused on identifying challenges of non-interoperable information systems
ii. Investigating barriers to achieving interoperability of information systems for effective maritime transport compliance monitoring and evaluation.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Responsive Regulation Theory

To achieve its objective, the study employed Responsive regulation theory (Ayres & Braithwaite, 1992), which claims that regulation should be responsive to the needs of regulators and those who are regulated. Various tools, such as persuasion, negotiation, and enforcement, should be used for achieving effective compliance. Once Information system interoperability is promoted, the regulator and the regulated can promptly identify trends and regulatory issues occurring in the maritime industry, making regulation more responsive rather than reactive. Delivering regulatory service in this manner allows the regulatee to quickly understand violations and take corrective action, reinforcing cooperative relationships through a negotiation approach without immediately escalating to punishment.

Interoperability enhances proactive service delivery by allowing different players to exchange information, carefully evaluate it, and plan from different perspectives. Providing services in a proactive way increases the utilization and thus experienced benefits to all stakeholders. Siloed information systems constitute a clear obstacle to improving trust in the public sector (The World Bank, 2022). In this view, System interoperability acts as a key enabler for regulations to be responsive to the needs of the regulator and regulatee through improved visibility and coordination among key maritime industry stakeholders, which reflects the core principle of Responsive regulation theory.

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2.1.2 The Socio-Economic Theory of Regulatory Compliance

In addition, the study opted for the socio-economic theory of regulatory compliance (Sutinen et al., 1999), which suggests that various factors such as economic incentives, social norms, and the perceived legitimacy of the regulator, i.e. process efficiency and fairness, and outcome fairness and effectiveness, influence regulatory compliance. Interoperability contributes to significant efficiency gains, and the delivery of services and data becomes immediately available and usable to stakeholders, which leads to time saving as administrative data can be accessed more quickly, and back-office processing and handling time is also reduced (The World Bank, 2022).

When systems are interoperable, stakeholders from both public and private sectors have greater confidence in the impact of their investments. Integrated ecosystems assist regulators and those who are regulated to better address their complex needs; they also allow stakeholders to share costs and insights and lower various barriers such as data problems (Hatcher-Mbu, 2024). This strengthens the belief among maritime stakeholders that the regulator acts fairly and effectively. As a result, the regulatory service delivery becomes more legitimate in terms of efficiency, effectiveness, and fairness, as echoed in the socio-economic theory of regulatory compliance.

2.2 Empirical Review

2.2.1 Challenges of Non-Interoperable Information Systems

Regulators need significant resources to obtain more data and information from businesses and other resources (Black, 2010). In government, these data are always scattered among governmental entities, causing delays and coordination issues. The absence of an integrated management system for data sharing has made data collection and management tedious. Expenses and time required to comply have been major issues businesses face when adhering to regulations. Businesses always realize the benefits or purpose of the regulation when they are in their favor and do not see the bigger picture benefits to the public (Department of Business Energy & Industrial Strategy, 2020). In addition, data quality has posed a great challenge in compliance (Matsuo & Gorgento, 2017). Integrating services has been identified as the key emerging issue in regulating services (REPOA, 2022). As a result, the identification of compliance patterns becomes even more challenging; affected parties are not well considered, and regulators are suspected of being more worried about risks by being too procedural than experts (Lodge, 2015).

Technology integration has transformed monitoring, enforcement, and reporting to regulatory compliance. Due to increased regulations and regulatory reporting requirements, various technologies and solutions have been introduced, such as robotics and report automation (Ernst & Young, 2019). Matsuo and Gorgento (2017) urge companies to utilize their available data and derive new analytics that further their cost-effective, risk-based approach to compliance and provide more valuable compliance information. Regulatory technology (RegTech) is a technical solution for managing regulatory issues. It aims to support governments in making regulatory monitoring and enforcement more efficient (Bolton & Mintrom, 2023). Murrer and Sainsbury (2020) reveal that governments will have large data repositories and be capable of monitoring behavior in real-time through compliance software and Artificial Intelligence. This will make it easier for companies and individuals to fulfill compliance obligations and limit incidences of non-compliance. Companies have started implementing data-driven approaches to dynamically and continuously improve compliance programs through automation (KPMG, 2023).Without automation, compliance monitoring and evaluation faces issues of data inaccuracy, inconsistency, and delays in operations. Automation allows information to flow in real-time and seamlessly connects government authorities (Thomson reuters, 2019).

2.2.2 Barriers to achieving Interoperability of Information Systems

Information system interoperability has several advantages in regulatory compliance: It strengthens issue identification and coordination, provides decision-makers with better information, improves the policymaking process, and boosts monitoring and assessment (Andres et al., 2024). While interoperability presents clear advantages for regulatory compliance, implementing interoperable systems can expose the compliance domain to cybersecurity risks. In addition, a few private integrators may dominate the process of facilitating integration due to proprietary nature of many emerging data networks though open standards could address this issue, but the balance between proprietary and open systems remains to be defined (Kirstein, 2018).Furthermore, companies are not ready to share data due to the effect of competitive intelligence despite the mutual value it can gain (Pan et al., 2023).

In addition, Digital trade facilitation solutions, such as Electronic Data Interchange (EDI) and electronic single windows, improve risk management for shipments and vessels prior to port arrival and enable real-time tracking, strengthening the readiness of government agencies. However, data access and sharing remain challenging for many businesses, as companies may be hesitant to disclose confidential commercial information. This reflects broader concerns over ICT security and the need to protect government networks and public platforms from cyber-attacks (UNCTAD, 2022). Although these technologies and systems offer substantial efficiency benefits for the maritime industry, they also introduce risks to critical operational systems essential to shipping. Such risks can stem from vulnerabilities in system design, integration, operation, or maintenance, as well as from both intentional and unintentional cyberthreats (International Maritime Organization, 2021).

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III. METHODOLOGY

The study used a mixed methods approach (qualitative and quantitative research approaches) to achieve breadth and depth of understanding and validation. It adopted a convergent or concurrent design, which involves collecting both quantitative and qualitative data, analyzing both datasets, and then integrating the two sets of analyses to cross-validate or compare the findings. This study was conducted in the Dar-es-Salaam region, where most maritime transport services are provided. The study's population included 300 individuals, including TASAC employees (137) and Compliance officers from the regulated entities (164) within the maritime transport compliance domain (Port Terminal Operators, Shipping Agents, Inland Container Depots (ICD), 17 Empty Container Depots, Container Freight Stations, and Inland Container Depots Vehicle).

For this study, purposive sampling was used, and eleven (11) participants were involved in the qualitative component. However, this was based on data richness (saturation) and the range of viewpoints, experiences, and insights that various participants brought to the study. The quantitative component of the study used simple random sampling. According to Yamane's formula, a sample size can be calculated using the formula below.

$n = N / [1 + N (e)^2$

Where:

n is the sample size

N is the population size

e is level of precision

Hence, a sample size of 171, which included TASAC employees and Compliance officers from regulated service providers, was used.

Based on data saturation and consultation with experts, in-depth semi-structured interviews with eleven (11) TASAC employees and compliance officers from regulated entities were used to collect qualitative data. The study also used the questionnaire for quantitative data collection. A prepared set of closed and open-ended questions was required to be filled in with answers; the questionnaire was administered online and collected to collect data from the respondent.

In both approaches, the study reviewed various documents as part of a secondary data collection technique, such as internal reports, technical documentation of TASAC's existing systems, regulations, and other operational documents that record compliance activities.

This study analyzed qualitative data through thematic analysis using Taguette software, which is a free, open-source, and user-friendly qualitative data analysis (QDA) tool. For the quantitative phase, data were analyzed through descriptive statistics and an Ordinal logistic regression model (Ordered model) using STATA-17 software and MS Excel. This study used methodological triangulation to ensure data reliability and validity using both quantitative and qualitative approaches. Data was collected from multiple sources, such as interviews, questionnaires, and document reviews, to cross-check and verify the consistency of findings. Key findings were sent to participants to validate the findings.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Background Information

The data Tables 1 to 3 below present the background information of the respondents who participated in the study, focusing on three key variables: respondent role in the shipping industry, years of experience, and the types of information systems used within their respective organizations for sharing compliance data. These variables provide important context for interpreting the findings related to information systems interoperability and compliance monitoring in the maritime transport sector.

Table 1

Descriptive Statistics on the Respondent Roles in the Shipping Industry

Role in the Shipping Industry	Freq.	Percent
Clearing and Forwarding Agent	15	9.38
Regulator	102	63.82
Port Authority	2	1.25
Dry port Operator (ICD, ECD, CFS, ICDV)	7	4.38
Ship Tallying Service Provider	1	0.63
Shipping Agent	33	20.63
Total	**160**	**100**

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Table 1 indicates that regulators constitute the majority (63.82 percent) of respondents involved in the study, suggesting their central role in overseeing data sharing and enforcement. Shipping agents follow with 20.63 percent, reflecting their significant involvement in day-to-day compliance activities. Clearing and forwarding agents make up 9.38 percent, while other roles, such as dry port operators (4.38 percent), port authority (1.25 percent), and ship tallying service providers (0.63 percent), are less represented. This distribution highlights a strong regulatory presence and suggests that any interventions to improve interoperable information systems should prioritize the regulator and shipping agent needs for maximum impact.

Table 2

Descriptive Statistics on Years of Experience in the Shipping Industry

Years of Experience	Freq.	Percent
1-3 years	38	23.75
4-7 years	45	28.13
8-10 years	16	10.00
Less than 1 year	8	5.00
More than 10 years	53	33.13
Total	**160**	**100**

Table 2 shows that the majority of respondents (33.13 percent have more than 10 years of experience in the shipping industry, indicating a strong presence of seasoned professionals. This is followed by those with 4–7 years of experience (28.13 percent) and 1–3 years (23.75 percent), suggesting a balanced mix of mid-level and early-career participants. Only 10 percent have 8–10 years of experience, and a small portion (5 percent have less than 1 year, reflecting limited representation from newcomers. Overall, the distribution implies that insights and feedback on maritime compliance and information systems come from a workforce with considerable experience, which adds credibility to the findings.

Table 3

Type of Information Systems Used to Share Compliance Data

System Type	Freq.	Percent
Emails	46	29.01
Single Window System (SWS)	36	22.84
Electronic Data Interchange (EDI)	24	14.81
Manual System (Printed reports/forms)	18	11.42
Online Portals	22	13.58
Shared Databases	12	7.72
EMS and Tanzania Electronic Single Window (TANESW)	1	0.63
Total	**160**	**100**

Results from Table 3 above show that emails are the most commonly used system for sharing compliance data, accounting for 29.01 percent of responses, followed by the Single Window System (SWS) at 22.84 percent, and Electronic Data Interchange (EDI) at 14.81 percent. These figures suggest that while some organizations are adopting modern, integrated systems such as SWS and EDI, a substantial number still depend on traditional tools like email, which may lack the efficiency, security, and automation offered by more advanced platforms.

The continued reliance on manual and email-based systems may hinder real-time data sharing, increase the risk of errors, and reduce overall operational efficiency. Second, the limited use of centralized digital platforms like TANESW or e-Government systems suggests underutilization of national ICT investments. This points to a need for enhanced stakeholder engagement, capacity building, and policy enforcement to ensure a consistent and secure compliance data-sharing ecosystem across the maritime and transport.

4.1.2 Challenges of Non-Interoperable Information Systems in Maritime Transport Compliance Monitoring

Table 4 below presents the findings related to the challenges arising from non-interoperable information systems in maritime transport compliance monitoring and evaluation. Respondents from various roles within the shipping industry were asked to indicate the extent to which they experienced specific challenges associated with fragmented or poorly integrated systems. The analysis captured key areas such as information accuracy, data problems, delays, and detection of non-compliance issues. These challenges are significant as they hinder timely decision-making, reduce operational efficiency, and compromise the enforcement of maritime transport rules and regulations

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Table 4

Issues Affecting Compliance Data Sharing and Maritime Enforcement

Variable	Occurrence of Compliance Data and Enforcement Challenges (Percentage)					
	Always	Frequently	Never	Rarely	Sometimes	Total
Delays Sharing Compliance data	1	16	4	22	57	100
Data Problems in shared data	3	16	5	22	54	100
Accuracy in Information Shared	55	6	23	9	7	100
Untimely Maritime Enforcement	7	18	1	19	55	100

The majority of respondents (57%) reported that delays in sharing compliance data occur sometimes, while 22% indicated these delays rarely happen. A smaller portion reported frequent (16%) and never (4%) occurrences, with only 1% stating that delays always occur. This suggests that delays are an alternating but common issue in compliance data sharing. Similarly, data problems in compliance were reported to occur sometimes by 54% of respondents and rarely by 22%. Another 16% indicated frequent occurrences, while 5% reported no such problems (quality and integrity), and 3% experienced them always. This pattern shows that data issues are generally present but not overwhelmingly persistent

Despite these challenges, A majority of 55% reported that compliance information shared is always accurate (correct and reliable), indicating strong confidence in the reliability of shared data. However, 23% stated accuracy never occurs, which is a concerning minority highlighting potential gaps in data integrity. Smaller proportions reported frequent (6%), rare (9%), or sometimes (7%) accuracy issues. In addition to data-related challenges, non-interoperability was reported to hinder timely enforcement, sometimes by 55% of respondents, with 19% indicating rare hindrance. Another 18% experienced this issue frequently, and 7% reported it always occurs. Only 1% stated this challenge never occurs, suggesting that interoperability issues are a notable barrier to effective maritime enforcement

During the interview, one critical challenge highlighted in maritime compliance monitoring imposed by non-interoperable systems was the slow and inefficient retrieval of information due to the need to access multiple, unintegrated systems or manually contact various stakeholders. One of the respondents stated that,

> *"Retrieving the necessary information for monitoring takes a long time. We have to contact different stakeholders manually or log in through different systems, which slows the entire process and can result in delayed enforcement actions".*

In addition, according to a respondent who works as a senior compliance monitoring officer at TASAC,

> *"There is a delay in receiving compliance data from stakeholders, as it depends on email, and we are forced to evaluate manually the reports received from terminal operators, which is time-consuming and sometimes contains errors".*

Communication through email and the manual handling of reports increases the likelihood of human error, hence may compromise data integrity and limit the ability to quickly analyze trends or detect anomalies. These highlight the need for automated, interoperable information systems that can facilitate real-time data exchange and reduce dependence on fragmented and labor-intensive processes.

It was also found that data access delay, data inaccuracy, and unreliability are among challenges in sharing performance data and operational statistics in the current practices, and information is often delayed in being updated, and incorrect information is present in key systems. One of the interviewees responded that,

> *"Performance statistics are often submitted late, and even when submitted, they cannot be reliably used, as they have at times been found to misrepresent the actual situation on the ground."*

Furthermore, one more interviewee stated that,

> *"The information in the systems is not updated on time in cargo clearance, and sometimes we find wrong information regarding vessel arrival in the ICD systems."*

During the study, it was also found that stakeholders are required to submit compliance reports to various government agencies with the same compliance reporting requirements, which creates additional operating costs. One respondent urged that,

> *"Our Company has to submit the same information to various government agencies for compliance, while the same information could be obtained from another government department."*

Another challenge encountered was the failure to detect forged documents and to verify documents issued by other government entities, such as business licenses. One compliance monitoring office from the regulatory authority declared that,

> *"During licensing, we are not able to identify forged documents and verify important information such as business licenses, which could be verified directly from other government systems".*

In addition, one of the respondents stated that:

> *"We often find discrepancies between different sets of records. This makes it difficult to establish a single source of truth and undermines the integrity of our compliance assessments since data is entered and stored in isolated systems."*

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The above findings point out that there is a critical weakness in compliance monitoring since, without real-time access to reliable external systems, regulatory authority and other stakeholders are left to rely on manual, potentially manipulated submissions. The absence of digital linkages with relevant databases results in delays and inaccuracies in operations, increases the risk of fraudulent approvals, undermines regulatory integrity, and poses risks to maritime safety and legitimacy.

4.1.3 Barriers to Achieving Interoperability of Information Systems for Effective Maritime Transport Compliance Monitoring

Table 5 below presents the findings related to Objective 2, which aimed to investigate the key barriers to achieving interoperability of information systems for effective compliance monitoring and evaluation in the maritime transport sector. Respondents were asked to rate the extent to which various technical, organizational, and legal factors hinder the interoperability of information systems in the maritime industry.

Table 5

Ordered Logistic Regression Coefficients

Dep. Variable	**y**		Log-Likelihood		-166.82	
Model	Ordered Model		AIC		347.6	
Method	Maximum Likelihood		BIC		369.2	
No. Observations	160					
Df Residuals	153					
Df Model	7					
	Coef.	**Std err**	**z**	**P>|z|**	**[0.025**	**0.975]**
Legal issues	0.1499	0.172	0.873	0.383	-0.187	0.486
Organization issues	0.7564	0.217	3.483	0.000	0.331	1.182
Technical issues	0.7133	0.202	3.523	0.000	0.316	1.110
0/1	-1.9984	0.785	-2.545	0.011	-3.537	-0.459
1/2	1.1960	0.216	5.538	0.000	0.773	1.619
2/3	1.1324	0.098	11.524	0.000	0.940	1.325
3/4	0.5772	0.178	3.241	0.001	0.228	0.926

An ordinal logistic regression model was employed for outcomes on an ordered scale, i.e., Never < Rarely < Sometimes < Frequently < Always. The ordered outcome is the frequency of key interoperability barriers, with predictors Legal issues, issues within the organization, and technological problems. The result reveals that the organization issues with the coefficient = 0.756 and $p < 0.001$, and technical issues with coefficient = 0.713 and $p < 0.001$ are statistically significant in increasing the odds of reporting higher frequency as key interoperability barriers, while legal issues with coefficient= 0.150, $p = 0.383$ is not statistically significant. In addition, the cut point parameters indicate that the ordered categories are not interpreted substantively; their significance just shows the model can distinguish adjacent response levels. Furthermore, lower values of Log-L = −166.82, AIC = 347.6, and BIC = 369.2 indicate a relatively better fit comparison across models.

During the interview, Security implications were noted as one of the barriers to achieving the integration of information systems in the maritime sector. One of the interviewees from the Shipping Agency company claimed that,

> *"Commercial data such as freight rates that affect competition in the market can be stolen, as there is a significant risk of data breaches, hacking, or other malicious attacks through system integration".*

Shipping Agents are concerned with this risk as it creates fear that sharing their system access could compromise their market advantage or expose business secrets. Another challenge found was that information systems currently in use are not stable and reliable. One of the interviewees claimed that,

> *"One key challenge we face in the maritime industry is that some of the systems in use are not consistently stable. We experience frequent downtimes, slow processing speeds, and prolonged technical problems".*

Another factor noted for not achieving system interoperability in the maritime industry was a technological gap. One interviewee expressed that,

> *"There are some stakeholders, such as Clearing and Forwarding Agents, who still lack dedicated information systems for their specific operational needs. Instead of using digital platforms, they often rely on manual processes, spreadsheets, or generic tools that are not designed for seamless integration with other maritime systems".*

This absence of automated tools limits the ability to exchange data in a timely, structured, and automated manner. It also creates bottlenecks in the compliance monitoring process, since information is often manually transferred or reformatted before it can be used by other stakeholders.

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It was also pointed out that there is a governance-related challenge in achieving interoperability within the maritime industry. As noted during the interviews, one respondent said that,

> *"Initiatives to ensure the integration and interoperability of systems in the maritime industry were not undertaken. This is partly attributed to the nature of the Port Community itself, which comprises multiple institutions and stakeholders (both public and private) mandated by various acts of Parliament. As a result, they do not fall under the regulatory jurisdiction of a single entity".*

During the interview, the fragmented stakeholder coordination was declared as a key institutional barrier to system interoperability in the maritime sector. One of the interviewees stated that,

> *"There is no clear policy mandating all stakeholders to use a unified or interoperable system. Without regulatory enforcement or strategic direction from authorities, different organizations continue using their preferred systems, resulting in fragmentation."* and he added that, *"There is poor coordination among maritime stakeholders, as each is focused on its own priorities."*

This autonomy results in a disconnected digital environment, where data is siloed and integration efforts are increasingly difficult. Additionally, a siloed mindset further obstructs collaboration, standardization, and investment in shared solutions

4.2 Discussion

Overall, the findings highlight that internal organizational issues and technological problems are all recognized as significant barriers to achieving interoperability to enhance regulatory compliance. While none of these barriers are universally persistent, they appear frequently to warrant attention and emphasize the need for improved infrastructure and management practices to support regulatory adherence. Legal and regulatory complexities also pose notable, though somewhat less frequent, challenges that may require clearer frameworks or guidance

Both quantitative and qualitative findings show that the fragmented information systems and delayed or inaccurate data transmission limit regulators' ability to detect non-compliance in real time or apply proportionate and timely enforcement measures. This aligns with the Department of Business (2020) that the absence of an integrated management system for data sharing has made data collection and management tedious, causing delays and coordination issues. This undermines the responsive nature of regulation, as enforcement actions become delayed and reactive rather than preventive in response. From another perspective, when businesses are burdened with redundant submissions, outdated communication methods, and uncoordinated regulatory processes, stakeholders view compliance as inefficient, frustrating, and unfair. This reduces voluntary compliance, especially when the system is seen as unreliable,

In addition, the fragmented nature of compliance infrastructure implies that without regulatory mechanisms that can respond responsively, the regulator's ability is limited in influencing change or enforcing interoperability standards. Similarly, the findings underscore that compliance cannot be achieved by rules alone. Socio-economic conditions, such as limited technological capacity among stakeholders, institutional misalignment, and lack of support, also hinder adherence to compliance rules and regulations.

This study extends the work of the European Union (2017) by showing that incompatible business processes, information models, and the diversity of technologies used are among the key barriers in exchanging information and collaborating electronically, as information systems in the public sector were set up independently of each other and not in a coordinated way. Furthermore, the integration of processes, systems. People and structures form a comprehensive and interdependent foundation for achieving effective information systems interoperability in maritime transport, compliance monitoring, and evaluation.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

This study reveals that information system interoperability is significant in ensuring effective compliance monitoring and evaluation in maritime transport. The results indicate that non-interoperable information systems cause delays, data problems, and inaccuracies in shared compliance information and untimely enforcement, which makes regulatory oversight less effective. Furthermore, the study shows that organizational and technological issues, such as information security and the absence of dedicated systems among some key stakeholders, remain significant barriers in achieving system interoperability for enhancing effective compliance monitoring and evaluation. The study aligns with earlier studies that systems interoperability provides decision-makers with better information and improves monitoring and assessment. The study highlights that there is a need to implement systems interoperability across maritime stakeholders, as it is a key enabler in regulatory service delivery. Addressing these identified challenges and barriers requires coordinated efforts among maritime stakeholders from both public and private sectors.

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5.2 Recommendations

The study recommends that a mechanism be developed for maritime transport stakeholders in Tanzania to effectively interlink their information systems. In addition, there is a need to provide technical and financial support to stakeholders with limited digital capacity. The mechanism to be developed has to ensure that processes and structures among stakeholders are aligned so that real-time data sharing can be achieved smoothly. Policymakers should ensure that laws and regulations, i.e., institutional mandates across maritime transport stakeholders, are aligned and harmonized. Future studies should focus on how emerging technologies such as blockchain and Artificial intelligence can ensure effective compliance monitoring and evaluation in the maritime industry.

REFERENCES

Ali, M., Grava, L., & Reaz, M. (2019). *Agile regulatory delivery for improved investment competitiveness in Bangladesh*. International Finance Corporation.

Andres, E., Vasquez, G., Chen, T., & Shin, A. (2024). Enhancing MSME data interoperability in the APEC region. *Enhancing MSME Data Interoperability in the APEC Region*, 14, 8.

Ayres, I., & Braithwaite, J. (1992). *Responsive regulation: Transcending the deregulation debate*. Oxford University Press.

Black, J. (2010). Risk-based regulation: Choices, practices and lessons being learnt. In *Risk and regulatory policy: Improving the governance of risk* (pp. 185–224). OECD.

Bolton, M., & Mintrom, M. (2023). RegTech and creating public value: Opportunities and challenges. *Policy Design and Practice*, *6*(3), 266–282. https://doi.org/10.1080/25741292.2023.2213059

Department of Business, Energy & Industrial Strategy. (2020). *Challenges businesses face when complying with regulation* (Report No. 2020/043). UK Government.

Ernst & Young. (2019). *Regulatory technology: Navigating the right technology to manage the evolving regulatory environment* (p. 11). Ernst & Young LLP.

Esther, F., Alice, W., & Williams, F. (2025). Digital transformation in maritime supply chains: A systematic review of digital information sharing platforms.

European Union. (2017). *New European interoperability framework: Promoting seamless services and data flows for European public administrations*. https://doi.org/10.2799/78681

Guidi, M., Guardiancich, I., & Levi-Faur, D. (2020). Modes of regulatory governance: A political economy perspective. *Governance*, *33*(1), 5–19. https://doi.org/10.1111/gove.12479

Hatcher-Mbu, B. (2024). Demystifying interoperability: Insights from our work in Ethiopia's agriculture sector.

International Maritime Organization. (2021). *Guidelines on maritime cyber risk management (MSC-FAL.1/Circ.3)* (44[0]), 1–6. https://www.imo.org/en/OurWork/Security/Pages/Cyber-security.aspx

Jokhadze, N. (2020). Implementation of interoperability of EU information systems in the justice and home affairs domain: Challenges and opportunities.

Kahyarara, G., & Simon, D. (2018). Maritime transport in Africa: Challenges, opportunities, and an agenda for future research. *Regional Agreements and Policies on Maritime and the Related Development* (September). https://unctad.org/system/files/non-official-document/dtltlbts-AhEM2018d1_Kahyarara_en.pdf

Kirstein, L. (2018). Information sharing for efficient maritime logistics. *International Transport Forum Discussion Papers*, 57, 36. https://doi.org/10.1787/def963a5-en

KPMG. (2023). *Implementing tech and data-driven compliance* (p. 7). KPMG LLP.

Lodge, M. (2015). Trends and challenges in regulation and regulatory policy. In *OECD Regulatory Policy Outlook 2015*. https://doi.org/10.1787/9789264241800-4-en

Mangalam, S. (2020). *Use of new technologies in regulatory delivery* (August 2021). The Donor Committee for Enterprise Development. www.enterprise-development.org

Matsuo, A., & Gorgento, R. (2017). The compliance journey: Boosting the value of compliance in a changing regulatory climate. Klynveld Peat Marwick Goerdeler (KPMG).

Murrer, C., & Sainsbury, C. (2020). Governmental use of technology for compliance monitoring and enforcement. *Butterworths Journal of International Banking and Financial Law*, December, 770–773.

Ndlovu, K., Scott, R. E., & Mars, M. (2021). Interoperability opportunities and challenges in linking mHealth applications and eRecord systems: Botswana as an exemplar. *BMC Medical Informatics and Decision Making*, *21*(1), 2. https://doi.org/10.1186/s12911-021-01606-7

Organisation for Economic Co-operation and Development. (2014). *Regulatory enforcement and inspections*. OECD Publishing. http://dx.doi.org/10.1787/9789264208117-en

Organisation for Economic Co-operation and Development. (2021). *Data-driven, information-enabled regulatory delivery*. OECD Publishing. https://doi.org/10.1787/8f99ec8c-en

Licensed Under Creative Commons Attribution (CC BY-NC)

Pan, S., Trentesaux, D., McFarlane, D., Montreuil, B., Ballot, E., & Trentesaux, D. (2023). Digital interoperability in logistics and supply chain management: State-of-the-art and research avenues towards Physical Internet. *Computers in Industry, 128*, 103435. https://doi.org/10.1016/j.compind.2021.103435

President's Office Public Service Management and Good Governance. (2022). *Tanzania e-government strategy: Digital government service, anywhere and anytime* (Issue 112). https://www.utumishi.go.tz/uploads/documents/e_strategy2022.pdf

REPOA. (2022). *Enhancing Tanzania's competitiveness in the logistics value chain* (p. 62). REPOA.

Ronoh, H., Omieno, K., & Mutua, S. (2018). An interoperability framework for e-government heterogeneous information systems. *International Journal of Advanced Research in Computer and Communication Engineering, 7*(10), 115–126. https://doi.org/10.17148/ijarcce.2018.71025

Sutinen, J. G., & Kuperan, K. (1999). A socio-economic theory of regulatory compliance. *International Journal of Social Economics, 26*(1–3), 174–193. https://doi.org/10.1108/03068299910229569

TASAC. (2021). *Corporate strategic plan (2021/22–2025/26)* (p. 44). Tanzania Shipping Agencies Corporation.

The World Bank. (2022). *Interoperability towards a data-driven public sector* (p. 18). The World Bank Group. http://documents.worldbank.org/curated/en/099550101092318102

Thomson Reuters. (2019). *Tools and best practices for informed compliance* (p. 4).

UNCTAD. (2022). *Review of maritime transport, 2022* (p. 126). United Nations Publications. http://www.unctad.org/en/docs/rmt2009_en.pdf

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Sociocultural factors influencing cervical pre-cancer screening among women attending Mbagathi level four hospital, Nairobi, Kenya

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ABSTRACT

Cervical cancer poses a significant global health challenge, causing around 340,000 deaths annually and ranking as the fourth most frequent cancer worldwide. The burden is heaviest in low- and middle-income countries (LMICs), where more than 90% of cervical cancer deaths occur, largely due to inadequate screening. In Kenya, cervical cancer is the second most frequent cancer among women after breast cancer, with 5,236 new cases and 3,211 deaths annually. Kenya's cervical cancer mortality rates are expected to increase by 50% by 2030. Cervical pre-cancer screening, as endorsed by the WHO, stands as a crucial strategy towards the elimination of cervical cancer by 2030. Sociocultural barriers such as stigma, gender roles, and economic constraints continue to limit participation in preventive health programs. This study aimed to determine the sociocultural determinants influencing cervical pre-cancer screening uptake among women attending Mbagathi Level Four Hospital in Nairobi, Kenya, using the Health Belief Model as the guiding theoretical framework. An analytical cross-sectional design was employed, targeting women aged 25–49 years. A total of 240 participants were interviewed through systematic random sampling at the hospital's Mother and Child Health Clinic. Data was collected using structured questionnaires administered via KoboCollect and supplemented by health worker interviews. Descriptive statistics, chi-square tests, and logistic regression analyses were conducted using SPSS version 26. The study revealed the cervical pre-cancer screening rate among respondents as 39.6%. Screening uptake was shaped by multiple sociocultural factors. Insurance coverage showed a notable disparity, with 65.8% of women enrolled in NHIF while 34.2% lacked coverage. Although 69.6% reported discussing cervical cancer screening, 30.4% avoided such conversations due to stigma and cultural restrictions. Social networks exerted a strong influence on behavior, as 55.4% of the participants had friends who had undergone screening. Regression analysis revealed that sociocultural factors moderately predicted screening uptake (R = 0.413), accounting for 17.1% of variance. Participation was mainly associated with age, education, occupation, and income, but not with marital status or religion. Results demonstrate that cultural stigmas together with financial difficulties and weak awareness levels prevent screening from taking place, although individuals show strong confidence in discussing the issue (mean = 4.79, SD = 0.579). The study results also demonstrate that sociocultural variables strongly influence preventive actions in healthcare, yet unidentified elements remain important. The solution to these hurdles demands expert-crafted education, which refutes superstitions while providing monetary support to reduce affordability problems, and peer-based healthcare promotion, which activates community networks. This research reveals universal importance beyond Nairobi through its demand for local healthcare initiatives that will break down barriers and achieve health equity across similar areas. Additional future research needs to study variables beyond the findings that include systemic roadblocks alongside mental barriers so that complete strategies for sustainable screening participation and cervical cancer prevention become possible.

Keywords: Cervical Cancer, Health Belief Model, Kenya, Pre-Cancer Screening, Sociocultural Determinants

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I. INTRODUCTION

Cervical cancer is a malignant tumor of the cervix, primarily caused by persistent infection with high-risk human papillomavirus (HPV) types, especially HPV-16 and HPV-18 (World Health Organization, [WHO], 2018. The global cancer observatory (GLOBOCAN), estimates 662 301 new cases annually with a mortality of 348 874 cases annualy with 94% of these deaths occurring in low and middle income countries (LMIC) (WHO, 2022). The World Health Organisation (WHO) has identified this essential matter by showcasing that cervical cancer causes a woman's death every two minutes thus necessitating worldwide intervention in 2018. Screening for pre-cancerous cells of the cervix stands as one of three crucial interventions to eliminate cervical cancer by 2030 despite receiving inadequate worldwide acceptance (WHO, 2018). Screening behaviours of communities are greatly affected by their sociocultural elements. Culture-based perceptions create misunderstanding about cervical cancer-causing misconceptions that link it to traditional illnesses or divine retribution which prevents women from getting screened (Biack *et al*., 2019). Research at the global scale demonstrates why healthcare providers must develop cultural competency when they aim to reduce barriers to screening and increase testing frequency.

In Sub-Saharan Africa (SSA), cervical cancer exacts a disproportionate toll, with a mortality rate of 23 per 100,000 women (Ngune et al., 2020). The screening statistics across the region demonstrate extremely poor performance through the 12.9% average rate observed between 2000 and 2019 (Yimer *et al*., 2021). Knowledge awareness acts as a vital factor because insufficient understanding about cervical cancer reduces screening participation but improved educational campaigns might boost participation rates up to five times (Yimer *et al.,* 2021). Women in Ghana with higher education levels display 122 times better rates of screening which eclipses those of women with lower education levels in Ethiopia who see their screening rates decrease by two-thirds (Ampofo *et al*., 2020; Desta *et al*., 2021). The implementation of screening programmes gets obstructed by social factors which incorporate monetary impediments alongside social prejudices and conventional yield to local medical practises (Swanson *et al*., 2018). The psychological factors of testing outcome fears together with privacy worries and stigma expectations exist extensively throughout the region (Lim & Ojo, 2017). Women's breast cancer screening decisions are greatly affected by gender-based norms that come from spouses as demonstrated by research in Nigeria and Ghana (Modibbo *et al.,* 2016; Binka *et al*., 2019). The research demonstrates that sociocultural elements psychological aspects and structural elements affect SSA in a complex relationship.

The leading female cancer death in Kenya is cervical cancer which results in 5,236 deaths every year and the forecasted burden will increase by 50% by 2030 (Ferlay *et al.,* 2018). Research indicates that sociocultural elements strongly affect screening rates even though the national rate remains at 16.4% according to Nyangasi *et al.* (2018). The knowledge deficit of cervical cancer acts as a major barrier to screening because research from Western Kenya identifies a lack of awareness as a contributing factor (Wachira *et al*., 2016; Morema *et al*., 2014). Research shows that Somali women from Kenya demonstrate 55.8% fear and embarrassment toward screening procedures (Abdikarim *et al*., 2017) similar to how women from Nairobi strongly favoured self-sampling options (Rositch et al., 2012). Women face two main barriers to pelvic exams: resistance and financial constraints as demonstrated by (Bradford & Goodman, 2013; Owenga & Nyambedha, 2018). The approval and financial assistance requirements from spouses act as principal gender dynamics factors in healthcare behaviour (Black *et al*., 2019). The cost of travel and diagnostic tests alongside low economic status create an additional barrier to screening for women in particular (Owenga & Nyambedha, 2018). Research demonstrates the essential requirement of developing specialised education programmes together with financial support networks and gender-specific care initiatives for enhancing screening outcomes in Kenya. It has been demonstrated that sociocultural barriers such as stigma, gender norms and cultural beliefs inhibit cervical pre-cancer screening.

1.1 Statement of the Problem

The WHO aims to eliminate cervical cancer by 2030 through screening programmes although annual worldwide mortality from this cancer reaches 340,000 people per year making it the fourth deadliest cancer (WHO, 2022). The screening rates in Sub-Saharan Africa remain at 12.9% even though mortality stands at 23 per 100,000 women because of sociocultural barriers that include stigma along with financial barriers and gender norms (Ngune *et al.,* 2020; Yimer *et al*., 2021). The population loss from cervical cancer in Kenya reaches 5,236 deaths every year based on data from Ferlay et al. (2018) and the disease is projected to increase by half by 2030. Mbagathi Level Four Hospital, a major public referral facility in Nairobi predominantly serves women from low-income and marginalized urban populations and socioeconomic challenges are particularly pronounced. Many patients depend on informal employment with unstable incomes, limiting their ability to afford transport, consultation, and follow-up treatment (Abdikarim *et al*., 2017, Nyangasi et al., 2018; and Owenga and Nyambedha, 2018). The analysis of patient-centred screening barriers persists to be unexplored even though policy changes and training solutions have solved facility-level issues (Mwenda *et al.,* 2022; MOH, 2020).Sociocultural realities position Mbagathi Hospital as a critical site for examining the intersection of poverty, education, and health system access in shaping cervical cancer screening behaviours. Unless these structural

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inequities are addressed, women attending Mbagathi will continue to face disproportionately low screening uptake, undermining Kenya's progress toward the World Health Organization's target of 70% screening coverage by 2030 (Canfell *et al*., 2020; WHO, 2018).

1.2 Research Objective

To determine sociocultural factors that influence cervical pre-cancer screening among women attending Mbagathi level four hospital, Nairobi, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Health Benefit Model

The Health Belief Model (HBM), developed by Rosenstock in the 1950s and expanded in the 1970s, remains one of the most widely used frameworks for explaining preventive health behaviors, including cancer screening. The model posits that individuals' likelihood of engaging in a health behavior depends on six constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. Applying the HBM to cervical cancer screening among women at Mbagathi Level Four Hospital in Nairobi helps reveal how sociocultural factors shape screening uptake.

Perceived susceptibility refers to a woman's understanding of her personal risk of developing cervical cancer. Women understanding their cervical cancer risk influences their decisions regarding screening tests. Limited knowledge about the existence of pre-cancerous lesions often leads to a diminished sense of vulnerability. The research conducted by Arbyn *et al.* (2020) shows how a low understanding of pre-cancerous cervical tissue diminishes its perceived threat particularly among women from rural Western Kenya (Wachira *et al.,* 2016). Pregnant women at Mbagathi Hospital do not seek screening services because they lack information about cancer detection while cultural traditions may prevent them from discussing cancer topics in public spaces.

Perceived severity reflects the extent to which women believe cervical cancer is a serious health threat. Cancer patients who have sufficient knowledge about cervical cancer's mortality risk tend to start prevention screening according to Canfell et al. (2020). The study of Mwenda, (2019) located in Nairobi indicate that numerous women show insufficient understanding regarding cervical cancer severity and fail to grasp its dangerous potential. Insufficient knowledge about cervical cancer related to sociocultural beliefs which ignore the disease severity creates barriers for patients to attend screening appointments at Mbagathi Hospital.

Perceived benefits highlight the protective value of screening. Educational and awareness programs have consistently demonstrated that communicating the life-saving potential of early detection improves women's willingness to undergo screening. A recent community health volunteer–led dialogue program in Kisumu County significantly improved women's knowledge and their perception of screening benefits (Onyango *et al*., 2024). Despite this, cultural resistance to gynecological procedures and distrust of the health system often outweigh these benefits in urban facilities like Mbagathi. Cultural tailoring of educational interventions, as shown in Ghana (Ampofo *et al.,* 2020) and rural Kenya (Rosser *et al*., 2015a), is therefore critical to encourage participation.

Perceived barriers encompass structural, social, and cultural obstacles that hinder screening. These include high costs, fear of stigma, spousal disapproval, and negative healthcare experiences. Research by Burrowes *et al.* (2022) in Ghana and Page *et al.* (2020) in Migori, Kenya, identifies obstacles like inadequate healthcare infrastructure, cost, and transportation issues. At Mbagathi Hospital, these barriers are likely exacerbated by sociocultural factors such as gender roles, where women's health is often deprioritized, or fear of judgment from healthcare providers. Inconsistent awareness campaigns further obscure the true extent of these barriers.

Cues to action are external triggers—such as health education campaigns, peer influence, or provider recommendations that prompt women to seek screening. Cues to action, like health education and public campaigns, can motivate screening. Abiodun *et al*. (2014) demonstrated this in Nigeria, where targeted messaging prompted women to act. However, in Nairobi's urban setting, where competing priorities and misinformation are rampant, such cues must be localized and persistent to be effective.

Finally, self-efficacy - women's confidence in navigating the screening process is critical. Bula *et al.* (2022) in Malawi found that educational programs can enhance self-efficacy, but at Mbagathi Hospital, cultural stigmas and systemic inefficiencies may undermine this confidence. Women may feel disempowered by long wait times, dismissive healthcare workers, or lack of privacy, all of which erode trust in the system.

Applying the HBM to Mbagathi Hospital highlights the need for interventions that address both individual beliefs and sociocultural realities. Health education must be culturally sensitive, tackling misconceptions about susceptibility and severity while emphasizing the tangible benefits of screening. Structural barriers, like cost and access, require policy-level solutions, while community-based programs can build self-efficacy and provide actionable cues.

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The HBM's relevance across diverse settings underscores its utility in crafting targeted strategies to improve cervical pre-cancer screening uptake in Nairobi's unique sociocultural landscape.

2.2 Empirical Review

Social and cultural elements worldwide determine how people access health resources for their care specifically regarding cervical pre-cancer screening tests. Binka *et al.* (2019) establish that community beliefs directly guide how people respond when offered screening services. In Ghana, some communities believe cervical cancer comes from the gods or stems from promiscuous behaviour thus making women avoid seeking screening services. According to Singh and Badaya (2012), cultural misunderstandings in India cause two major problems: the mistreatment of cervical cancer as traditional health issues and the wrong diagnosis of vaginal bleeding as menstrual symptoms which leads women to continue using self-administered medications. Research findings validate the widespread challenge of countering embedded cultural explanations that stop people from using early detection services and screening programmes worldwide.

Traditional customs together with gender dynamics in Africa create additional hurdles which restrict women from accessing cervical pre-cancer screening. Black *et al*. (2019) together with Kasraeian *et al.* (2020) describe how spousal support deficiency, social discrimination, and faith healer adoption prevent women from using screening services. The combination of religious modesty beliefs and healthcare provider gender requirements generates barriers to cervical pre-cancer screening for Muslim women in Nigeria according to Modibbo *et al*. (2016). These women demand female medical professionals and chaperones and need their husbands' permission because of both religious standards and financial needs. The research studies by Ongtengco *et al*. (2020) from Senegal and Binka *et al.* (2019) from Ghana show how male authority shapes healthcare choices since women need both permission and financial backing from their spouses to receive screening services. Gender norms along with traditional practices maintain their hold across African societies to limit women's ability for self-determination and healthcare prevention access.

Economic along with sociocultural factors in Kenya develop the screening behaviours for pre-cancerous cervical cells. Owenga and Nyambedha (2018) explain that financial obstacles including travel expenses and diagnostic fees negatively impact women from Western Kenyan low-income regions by hindering their ability to access screening services. Cultural beliefs together with gender dynamics similar to what other African societies experience act as major determining factors. Women commonly encounter both the financial stress of putting family first and the social stigma against cervical cancer leading them to avoid proactive health cheques. The authors suggest financial support combined with expanded insurance plans would help minimise these obstacles (Biddell *et al*. 2021). The solution to Kenya's specific healthcare problems depends on implementing culturally appropriate educational programmes and economic support services to allow women to dedicate attention to their health despite socioeconomic barriers.

III. METHODOLOGY

Analytical An analytical cross-sectional study was conducted among women aged 25–49 years attending the Mother and Child Health clinic at Mbagathi Level Four Hospital, Nairobi. A total of 240 participants were selected by systematic random sampling, every 6th eligible clinic attendee and interviewed using a structured questionnaire administered electronically via KoboCollect. The pretest took place at Mama Lucy Level Four Hospital while research assistants received training to maintain data quality through strict management practises that strengthened both validity and reliability.

The study data was exported and analysed with the aid of Statistical Package for Social Sciences (SPSS) version 26.0 through both descriptive and inferential statistical methods to determine sociocultural screening uptake factors. This study applied descriptive analytics to present the findings of participant responses and utilised Chi-square tests together with logistic regression to discover key contributors to screening practice changes among participants. The research investigated the influences of sociocultural community beliefs and gender norms together with family dynamics on women's screening behaviour. The research methods delivered precise insights about how cultural beliefs and spousal backing alongside traditional customs produce barriers or opportunities for screening utilisation within Kenyan urban communities.

The research team maintained ethical standards from the beginning to the end of their work. The Mount Kenya Research Ethics Committee together with the National Commission for Science, Technology and Innovation (NACOSTI), Nairobi County Research Committee and Mbagathi Level Four Hospital Research Committee granted approval followed by the participants' acknowledgment of their freedom to withdraw from the study without penalties. Process anonymization served to protect confidentiality by following strict privacy regulations. The investigation concentrated on sociocultural elements to deliver practical solutions for policymakers and healthcare providers as it supported the development of culturally appropriate interventions for cervical pre-cancer screening at Mbagathi Hospital alongside comparable healthcare facilities.

IV. FINDINGS & DISCUSSION

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4.1 Findings

The study analyses how cultural standards, financial circumstances, healthcare availability and societal behavioural norms affect women's involvement in pre-cancer screening tests for cervical cancer diagnosis and their medical prevention perceptions.

4.1.1 History of Cervical pre- cancer screening

The primary outcome was whether a participant had undergone cervical pre-cancer screening. This was measured by the question: "Have you had a cervical pre-cancer screening?" Of the total sample of 240 participants, Figure 1 reveal 39.6% (95 participants) reported that they had been screened for cervical cancer before. In contrast, 60.4% (145 participants) indicated that they have never been screened for cervical cancer.

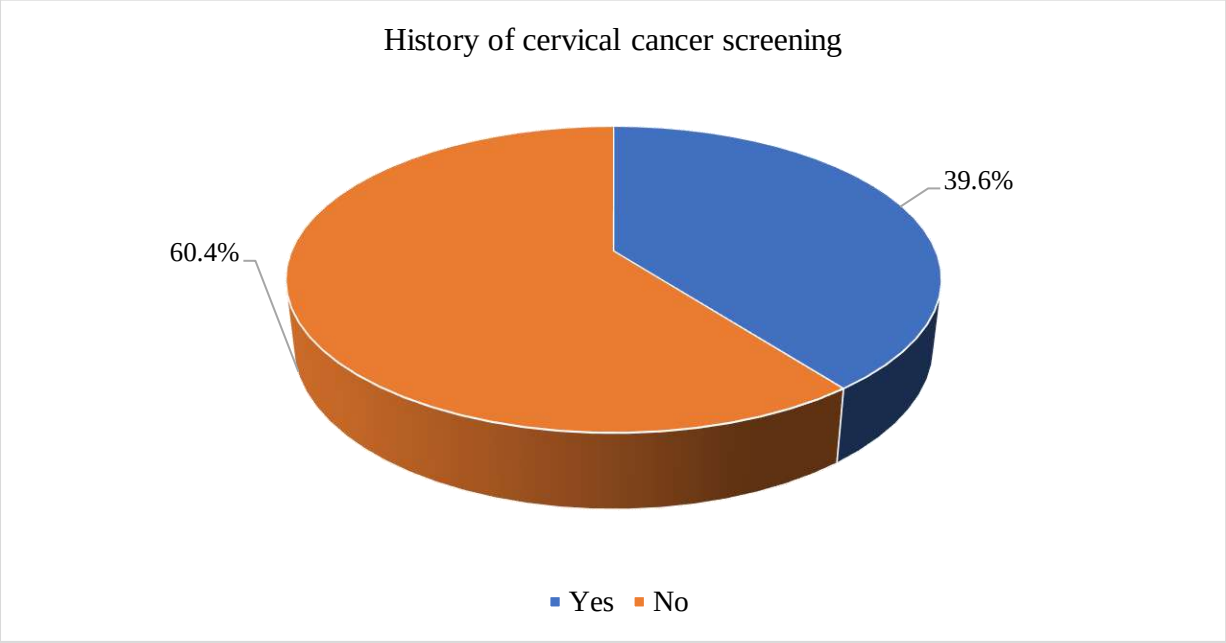

Figure 1

History of Cervical Cancer screening.

4.1.2 Timing of Last Cervical Cancer Screening Among Participants

Among those who have been screened, Table 1 reveal that the most common time frame was within the past year, with 20.8% having undergone screening during this period. 4.6% were screened two years ago, 5.0% three years ago, 2.1% four years ago, and 5.8% were screened five or more years ago.

Table 1

Timing of the last cervical cancer screening

Last screened	Frequency	Per cent
1 year ago	50	20.8
2 years ago	11	4.6
3 years ago	12	5.0
4 years ago	5	2.1
5 years or more	14	5.8
Never	148	61.7
Total	240	100.0

4.1.3.Perception of Hospital Costs for Cervical pre-Cancer Screening

The study sought to find out the perception of participants towards the cost of doing cervical pre-cancer screening test. The findings in figure 2 reveal that 20.0% (48 participants) believe there is a hospital cost associated with cervical cancer screening, while 80.0% (192 participants) believe there is no cost.

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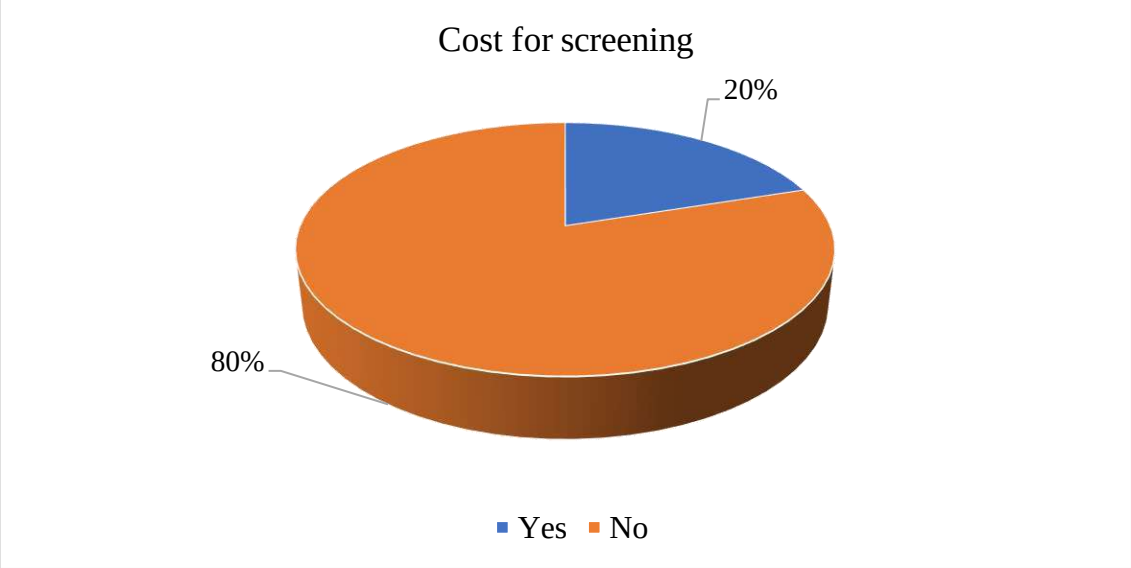

Figure 2
Perception of Hospital Costs for Cervical Pre-Cancer Screening

4.1.4 Health Insurance Policy (NHIF)

The findings presented in Figure 1 demonstrate the various health insurance coverages among the study participants with emphasis on the National Hospital Insurance Fund (NHIF). The research shows that 158 participants (65.8%) possessed NHIF coverage but 82 respondents (34.2%) did not have this health insurance. The study findings reveal a substantial gap in insurance coverage because these results could affect how the studied population utilises healthcare services.

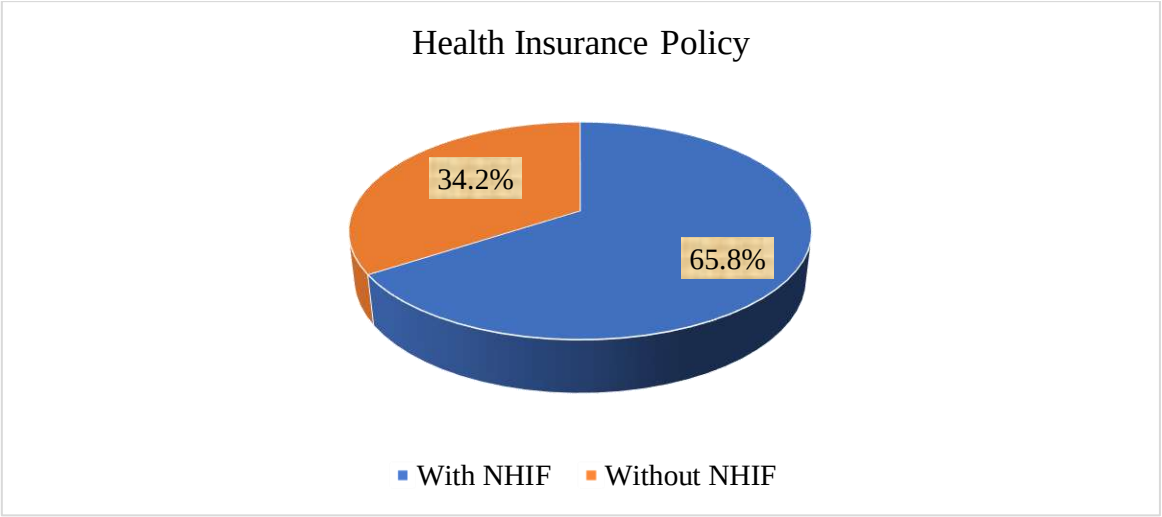

Figure 3
Health Insurance Policy (NHIF)

4.1.5 Cervical Cancer Communication

The study sought to reveal if participants had discussed with friends and relatives about cancer of the cervix to visulize communication patterns in the community. The study found that 167 participants among 240 respondents (69.6%) discussed cervical cancer whereas 73 respondents (30.4%) did not participate in such discussions. Although many cohort members discuss cervical cancer issues the high number of non-communicators indicates insufficient knowledge or reluctance to discuss this topic which could affect screening actions and medical results as shown in figure 4.

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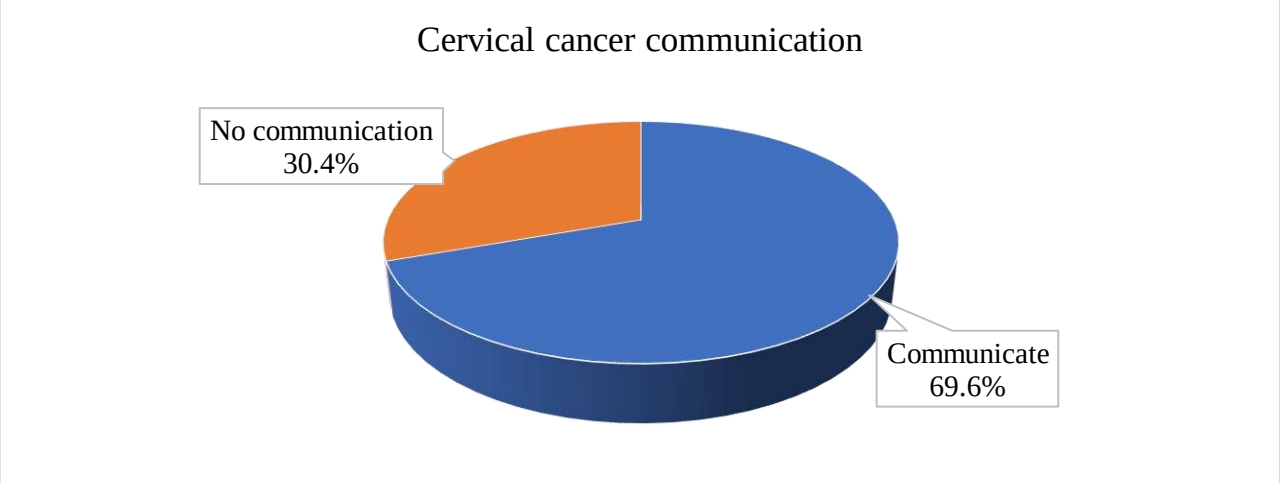

Figure 4
Cervical Cancer Communication

4.1.6 Friends or Relatives Screened for Cancer of the Cervix

Looking for social influence on cervical pre-cancer screening, the study sought to reveal if friends and relatives had been screened. Figure 5 presents findings that showcase cervical cancer screening history among friends and relatives of participants. A moderate proportion of 55.4% (133 out of 240) participants from the study explained that their friends or relatives underwent screening procedures. A significant number of 44.6% who participated in the study (107 out of 240) revealed their friends and relatives had not undergone cervical pre-cancer screening tests. Several members of respondent social networks have been screened but many more contacts still need targeted interventions that could help activate peer advocacy for wider screening programmes.

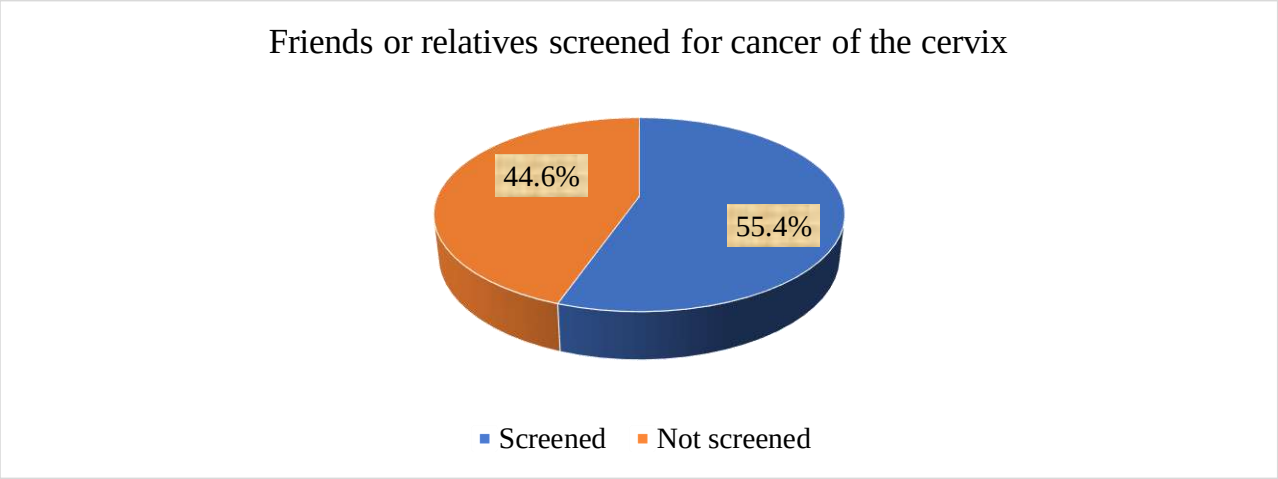

Figure 3
Friends or Relatives Screened for Cancer of the Cervix

4.1.7 Sociocultural Factors that Determine Pre-Cervical Cancer Screening

The study sought how much participants agreed with sociocultural factors influencing cervical pre-cancer screening; confidence in talking about cervical pre-cancer screening with relatives and friends, pelvic examination as taboo, Seeking healthcare services as a collaborative decision, spousal support in screening and the feeling of being limited to seek healthcare services because of being a woman. Table 1 displays mean values and standard deviations from the examination of sociocultural pre-screening factors. The survey scores demonstrate significant relationships because the measurement scale reflects increasing agreement and confidence levels.

Most participants expressed very high self-confidence (4.79, SD = 0.579) in explaining cervical cancer screenings to friends and relatives even though the data shows low variation throughout the group. The results indicate respondents avoided strong opinions about pelvic examinations as taboo with an average score of 2.63 and a standard deviation of 1.384. The two variables measuring family involvement in healthcare choices (mean = 4.06, SD = 1.341) and partner support for screening tests (mean = 4.38, SD = 1.020) received high scores from the respondents while showing minimal variation. Research participants moderately agreed on the experience of limitations when pursuing

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healthcare services as women although standard deviations showed wide variations between respondents. The sociocultural factors revealed a positive overall effect on screening practises (mean = 4.00, SD = 0.968) but taboos and gender restrictions demand specific interventions that will eliminate cultural obstruction and structural barriers.

Table 2

Mean and Standard Deviation for Sociocultural Factors that determine Pre-Cervical Cancer Screening

Tests	N		Mean	Std. Dev.
	Valid	Missing		
I am confident about talking to friends or relatives about Cervical cancer screening	240	0	4.79	.579
Pelvic examination is a taboo	240	0	2.63	1.384
Seeking healthcare services is a family collaborative decision	240	0	4.06	1.341
My spouse is very supportive of cervical cancer screening	240	0	4.38	1.020
I feel sometimes limited in seeking healthcare services as a woman	240	0	3.83	1.438
Aggregate sociocultural factors that determine pre-cervical cancer screening	240	0	4.00	.968

4.1.8 Regression Model for Sociocultural Factors Determining

The data from Table 3 demonstrates how sociocultural elements influence individuals' practises of cervical pre-cancer screening evaluation. The R-value of 0.413 in the model summary demonstrates that aggregate sociocultural factors have a moderate positive connection to aggregate cervical pre-cancer screening measurements. Socio-cultural variables demonstrate an ability to predict 17.1% of screening uptake by screening criteria when adjusted R-squared (0.167) measures how well these variables predict the screening uptake. The model prediction accuracy was measured through its standard error of 0.640.

Data analysis shows the statistical significance of the model as indicated by an F value of 48.989 and a p-value equal to 0.000 which demonstrates the predictor variable's ability to explain screening behaviour differences. The amount of total variation explained by the regression model reaches 20.040 (117.400) points and the unexplained variance exists at 97.360.

The coefficients table reveals that when aggregate sociocultural factors rise by one unit then cervical pre-cancer screening uptake grows by 0.299 units (B = 0.299). The standardised coefficient value (Beta = 0.413) indicates that the influence is moderate. The model demonstrates robustness through significant statistical values achieved by the constant (p = 0.000) and the predictor (p = 0.000). Unstudied variables probably make significant contributions to screening behaviour although sociocultural factors show notable influence.

Table 3

Regression Model for Sociocultural Factors Determining

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.413[a]	0.171	0.167	0.640

a. Predictors: (Constant), Aggregate sociocultural factors that determine pre-cervical cancer screening

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.040	1	20.040	48.989	.000[b]
	Residual	97.360	238	.409		
	Total	117.400	239			

a. Dependent Variable: Aggregate cervical pre-cancer screening

b. Predictors: (Constant), Aggregate sociocultural factors that determine pre-cervical cancer screening

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.254	.176		18.502	.000
	Aggregate sociocultural factors that determine pre-cervical cancer screening	.299	.043	.413	6.999	.000

a. Dependent Variable: Aggregate cervical pre-cancer screening

4.1.9 Chi-Square test of Independent of Sociocultural factors that determine Pre-Cervical Cancer Screening among different Demographic Characteristics

Table 4 presents crosstabulations between sociodemographic elements and pre-cervical cancer screening sociocultural beliefs using the Disagree, Neutral, Agree, and Strongly Agree response categories. The V Cramer

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statistics together with p-values provide measures for evaluating both the strength and statistical significance between different factors.

The variables of age yield meaningful statistics in their relationship with sociocultural factors (Cramer's V = 0.189, p = 0.036). Between 115 and 158 younger participants aged 34 years and below demonstrated agreement to sociocultural screening influences but only 49 to 82 older participants aged above 34 years expressed similar levels of agreement. Screening attitudes display different sociocultural influences among younger versus older individuals in the population. The education level between participants shows a meaningful correlation with an effect value of Cramer's V = 0.219 (p = 0.009). The majority of survey participants with formal education (157 out of 221) believe strongly in breast cancer screening services but those with informal education express a wider range of responses due to the positive influence of education on screening acceptance. Occupation together with income data show strong relationships which affect the study. The employment status of respondents demonstrates a connection to their screening agreement level because formal workers exhibit lower agreement (75 out of 127) compared to informal workers who show higher agreement (89 out of 113). This discrepancy may stem from different health information exposure. The relationship between income and screening choices demonstrates that Kes 0-30,000 respondents tend to agree or strongly agree with screening initiatives (129 out of 172). At the same time, higher-income individuals exhibit less agreement indicating economic limitations influence sociocultural perceptions (Cramer's V = 0.220, p = 0.001).

The relationships between marital status and religion and number of children and breast cancer screening behaviour are both weak and fail to achieve statistical significance (p values exceed 0.05). Religion (Cramer's V = 0.057, p = 0.857) together with marital status (Cramer's V = 0.051, p = 0.891) produce no significant differences in responses among the study participants indicating that these variables do not influence screening attitudes substantially. Similarly, the number of children (Cramer's V = 0.095, p = 0.543) shows minimal variation, with slight differences between those with no children and those with one or more. Sociodemographic factors consisting of age alongside education level together with occupation status and income have proven as substantial determinants which show the importance of developing targeted intervention methods to remove sociocultural and socioeconomic barriers in screening adoption.

Table 4

Crosstabulation of Sociodemographic and Sociocultural Factors that determine Pre-Cervical Cancer Screening

Sociodemographic factors		**Sociocultural factors that determine pre-cervical cancer screening**				**Total**	**Cramer's V**	**P value**
		Disagree	**Neutral**	**Agree**	**Strongly Agree**			
Age of the participants	<= 34 Years	11	32	43	72	158	0.189	0.036
	>34 Years	7	26	27	22	82		
Total		**18**	**58**	**70**	**94**	**240**		
Marital Status	Not married	8	27	30	46	111	0.051	0.891
	Married	10	31	40	48	129		
Total		**18**	**58**	**70**	**94**	**240**		
Religion	Christian	17	54	65	90	226	0.057	0.857
	Muslim	1	4	5	4	14		
Total		18	58	70	94	240		
Number of Children	0	5	11	11	22	49	0.095	0.543
	>= 1	13	47	59	72	191		
Total		**18**	**58**	**70**	**94**	**240**		
Highest level of education completed	Formal education	16	48	65	92	221	0.219	0.009
	Informal education	2	10	5	2	19		
Total		18	58	70	94	240		
Current occupation	Formal	12	40	41	34	127	0.280	0.000
	Informal	6	18	29	60	113		
Total		**18**	**58**	**70**	**94**	**240**		
Average monthly income	Kes 0 -30,000	13	30	48	81	172	0.220	0.001
	Kes 30,001 - 100,000	5	25	20	13	63		
	Kes > 100,000	0	3	2	0	5		
Total		**18**	**58**	**70**	**94**	**240**		

4.2 Discussion

The findings in Figure 1 reveal a significant gap in cervical cancer screening within the study population, with 60.4% of participants never having been screened. This substantial percentage indicates that, despite efforts to raise awareness and promote screening, barriers still exist that prevent women from accessing or opting for cervical cancer

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screening. These barriers could be related to socio-cultural factors, financial constraints, or lack of adequate health education, as suggested by previous studies (Mwenda *et al*., 2022; Swanson *et al*., 2018). Conversely, 39.6% of the participants had been screened for cervical cancer, which is encouraging and indicates that a notable portion of the population is engaging in preventive health behaviours. This percentage, while promising, also underscores the need for further efforts to improve screening rates. Studies have shown that higher educational attainment and awareness levels are critical in increasing screening uptake (Yimer *et al*., 2021). Therefore, targeted interventions focusing on education, reducing financial barriers, and addressing socio-cultural obstacles are essential to enhance screening rates and ultimately reduce the incidence and mortality associated with cervical cancer. Among those who have been screened, Table 1 show the most common time frame was within the past year, with 20.8% having undergone screening during this period. This suggests that recent screening efforts have been somewhat effective in reaching a segment of the population, reflecting the impact of ongoing awareness campaigns and health interventions (Mwenda *et al*., 2022). However, the percentage of participants who were screened decreased significantly for those who were screened two or more years ago. This decline in screening rates over time indicates a potential gap in sustained engagement and follow-up for cervical cancer screening. Specifically, 4.6% were screened two years ago, 5.0% three years ago, 2.1% four years ago, and 5.8% were screened five or more years ago. These findings highlight the need for continuous and reinforced efforts to maintain regular screening practices among women. Studies have shown that consistent reminders and follow-up initiatives are crucial for sustaining high screening rates and ensuring early detection and treatment of cervical pre-cancer conditions (Yimer *et al*., 2021). Addressing barriers that prevent regular screening, such as accessibility, financial constraints, and socio-cultural factors, is essential to improve long-term screening adherence and reduce the incidence and mortality associated with cervical cancer.

The findings presented in Figure 2 show that 20.0% of the participants believed there was a hospital cost associated with cervical cancer screening. This perception might reflect personal experiences or misinformation about the screening process and its associated expenses. Addressing these perceptions is crucial, as financial barriers can significantly impact health-seeking behaviours and deter women from accessing preventive services (Mwenda *et al*., 2022). Conversely, 80.0% of the participants believed that cervical cancer screening at the hospital was free of cost. This indicates a prevalent belief among the majority that financial constraints do not impede access to screening services. This positive perception is essential for promoting widespread participation in cervical cancer screening programs. However, ensuring that accurate information about the availability and cost of screening services reaches all segments of the population remains critical. Misconceptions about costs could still prevent some women from seeking screening, highlighting the need for continuous and clear communication from healthcare providers and public health campaigns (Nyangasi *et al*., 2018).

In Figure 3, 158 participants (65.8%) reported active cover under Kenya's National Hospital Insurance Fund (NHIF), while 82 (34.2%) had no NHIF cover. This split is consistent with wider evidence that affordability constraints, informal employment, limited understanding of benefits, and distrust or dissatisfaction with public services suppress enrolment and retention. Qualitative and mixed-methods work in Kenya shows that many households—especially in the informal sector—struggle with premiums, have limited knowledge of how insurance works, and report concerns about service quality and responsiveness, all of which dampen demand for NHIF (Barasa *et al.,* 2017). Lack of insurance is closely tied to delays or foregoing needed care because of cost. National analyses document substantial cost-related unmet need in Kenya and show that uninsured and poorer households are disproportionately affected. Even among NHIF members, financial protection may be shallow and attrition high, which helps explain the sizable uninsured share observed in urban public facilities like Mbagathi (Njagi *et al*., 2020; Oyando *et al*., 2023). Programmatic studies also indicate that knowledge of the NHIF benefits package influences access and use; members who better understand their entitlements navigate services more successfully. Strengthening outreach and simplifying communication about benefits are therefore plausible levers to reduce the uninsured gap in similar urban settings (Were *et al*., 2024).

The data from Figure 4 show that 69.6% of participants had engaged in discussions about cervical cancer, while 30.4% avoided such dialogue. This divergence reflects persistent knowledge gaps and sociocultural barriers, including stigma and discomfort around reproductive health topics. Evidence from Kenya and other Sub-Saharan African settings highlights that cultural norms and taboos often constrain open communication about cervical cancer, thereby limiting informed decision-making and awareness of preventive options (Abdikarim *et al*., 2017; Rosser *et al*., 2015). Avoidance of dialogue has important implications for health outcomes. Studies indicate that restricted communication reduces screening uptake, as women who do not discuss cervical cancer with peers, partners, or health workers are less likely to perceive themselves at risk and to seek preventive services (Gitonga *et al*., 2022). Further reinforcing this, stigma is manifested as internalized fear or societal judgment and has been shown to directly inhibit health-seeking behaviors. In Kisumu, women reported that anticipatory stigma, misunderstanding HPV and cervical cancer, and peer judgment discouraged them from getting screened (Ginjupalli *et al*., 2022). These insights underscore that effective health communication is essential. Tailoring interventions to enable safe, culturally sensitive conversations—through community forums, peer-led education, or multimedia strategies—can substantially mitigate stigma and improve screening behaviors (Onyango *et al.,* 2024).

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Figure 5 illustrates a meaningful difference in how social networks relate to cervical cancer screening behaviors: 133 of 240 respondents (55.4%) reported having friends or relatives who had undergone screening, while 107 (44.6%) indicated no such social exposure. Peer influence appears to play a vital role—those embedded in networks with screened individuals may be better informed and motivated to act, whereas those without such connections might lack awareness or be subject to cultural norms that discourage preventive health actions. Recent literature underscores this pattern. A 2022 study in Kiambu County, Kenya, found that women who reported knowing someone screened for cervical cancer were significantly more likely to participate in screening themselves. The findings suggested that peer examples lower uncertainty, reduce stigma, and enhance perceived social norms around health behaviors (Gitonga *et al*., 2022). Similarly, mixed-methods research in western Kenya highlighted that social relationships—such as conversations with screened community members—serve as powerful facilitators of screening uptake. Women cited testimonials from peers as motivating, while the absence of such information sources contributed to reticence (Adewumi *et al*., 2023).

Table 2 highlights the complex role of sociocultural factors in shaping cervical cancer screening behavior. Respondents expressed strong confidence (M = 4.79, SD = 0.579) in discussing screening with peers and relatives, reflecting growing openness and agency around the subject suggesting increasing openness and willingness to engage in dialogue. This reflects a positive shift in agency and awareness, which may help reduce stigma when supported by broader health education initiatives. At the same time, pelvic examinations remain mixed, with relatively low scores (M = 2.63, SD = 1.384) indicating that many still perceive such procedures as culturally inappropriate, underscoring how cultural sensitivities and stigma continue to act as barriers to gynecological services (Rosser *et al*., 2015; Abdikarim *et al*., 2017). Family and partner support were rated highly, with healthcare decisions often described as collaborative (M = 4.06, SD = 1.341), and spousal support in particular scoring very strongly (M = 4.38, SD = 1.020) emerging as central to screening decisions. These findings confirm that family dynamics—especially partner endorsement—are crucial determinants of women's preventive health behaviors, consistent with recent evidence from Kiambu and western Kenya (Gitonga *et al*., 2022; Adewumi *et al*., 2023). Conversely, gender-related barriers remain significant. Women reported sometimes feeling limited in accessing services due to their gender (M = 3.83, SD = 1.438), reflecting systemic inequities and cultural expectations that constrain health-seeking autonomy. Research has shown that gender discrimination and stigma reduce women's ability to seek timely care, especially in patriarchal settings (Nyangasi *et al*., 2019).

Table 3 demonstrates a moderate but statistically significant association between sociocultural factors and cervical pre-cancer screening behavior. The model produced an R value of 0.413, indicating a noticeable correlation, while the R^2 value of 0.171 shows that sociocultural variables explain approximately 17.1% of the variance in screening participation. Although this reflects only partial explanatory power, it confirms that cultural and social dynamics exert a measurable influence on women's preventive health choices. The model fit was strong ($F = 48.989$, $p < 0.001$), confirming that the relationship is statistically reliable. A one-unit increase in sociocultural support was associated with a 0.299 unit increase in screening behavior ($B = 0.299$, $\beta = 0.413$, $p < 0.001$). This finding suggests that factors such as spousal support, family involvement, peer encouragement, and reduced stigma directly enhance screening uptake, consistent with evidence from Kenyan and regional studies. Gitonga *et al*. (2022) found that partner and peer support significantly improved cervical cancer screening participation in Kiambu County, while Adewumi *et al*. (2023) reported that community-level stigma and cultural taboos in western Kenya reduced women's likelihood of seeking screening. Similarly, Nyangasi *et al*. (2019) demonstrated across multiple low- and middle-income countries that stigma and gender inequities remain structural barriers, limiting the effectiveness of awareness campaigns alone. These results highlight that while sociocultural factors are influential, they are not sufficient on their own; the majority of variance (82.9%) remains unexplained by the model, pointing to the importance of structural interventions such as affordability, accessibility, and health system responsiveness. Thus, strategies to increase screening uptake at Mbagathi Hospital and similar urban facilities must integrate cultural sensitivity with systemic health reforms, ensuring that social support aligns with service availability.

Table 4 highlights the interplay between sociodemographic characteristics and sociocultural perceptions of cervical cancer screening. Age was significantly associated with screening attitudes (Cramer's V = 0.189, p = 0.036), with younger women (≤34 years) showing stronger agreement with sociocultural explanations (115 of 158) than older participants (>34 years: 49 of 82). This generational divide may reflect differences in health literacy, openness to preventive health, and exposure to community health education (Rosser *et al*., 2015b; Gitonga *et al*., 2022). Education emerged as a powerful determinant (Cramer's V = 0.219, p = 0.009). Among those with formal education, 157 of 221 respondents agreed with the value of screening, compared to only 7 of 19 with informal education. This underscores the well-established role of education in shaping awareness and health-seeking behavior, as women with more schooling are more likely to understand screening benefits (Nyangasi *et al*., 2019; Adewumi *et al*., 2023). Occupation also mattered (Cramer's V = 0.280, p < 0.001). Informal workers showed higher approval rates (89 of 113) compared to formal employees (75 of 127). This may be linked to greater exposure to grassroots health campaigns and community outreach targeting low-income populations, which often emphasize free or subsidized services (Adewumi *et al*., 2023). Income level was another key predictor (Cramer's V = 0.220, p = 0.001). Women earning ≤KES 30,000 monthly expressed the

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strongest approval (129 of 172), suggesting that low-income women are particularly reliant on accessible and affordable screening services, while those with higher income may seek care privately or prioritize other health needs (Huchko *et al*., 2015). By contrast, marital status (Cramer's V = 0.051, p = 0.891), religion (Cramer's V = 0.057, p = 0.857), and number of children (Cramer's V = 0.095, p = 0.543) showed little or no association with screening perceptions. This indicates that while personal identity factors may play some role, structural and socioeconomic variables exert a stronger influence on screening attitudes in this population. This data argues for targeted solutions which combine Cultural and Economic approaches because age, education level, career status and earnings status show high priority as influential factors thus requiring studies focused on local intervention methods.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This study shows sociocultural elements have a moderate impact on pre-cancer cervical screening practises and require specialised cultural education strategies to handle existing taboos and gender limitations but to utilise spouse support and personal communication abilities. Understandings about pre-cancerous cervical screening depend on sociodemographic factors such as age, education level and household income which require targeting specific strategies that merge educational programmes with financial subsistence alongside peer support initiatives to eliminate barriers experienced by marginalised populations.

5.2 Recommendations

The improvement of pre-cancer cervical screening requires educational programmes which deliver customised material about taboo issues and false beliefs while using community healthcare providers and peer advocacy to spread knowledge. The support of spouses will multiply through male-focused programmes because these programmes enable joint healthcare decisions. The programme should address financial limitations through subsidies coupled with expanded coverage for healthcare access especially for low-income female patients. The implementation of home testing collections decreases patient apprehension about cultural barriers and privacy-related issues. Peer-driven initiatives implemented through social networks serve to boost screening advocacy and uptake between people.

REFERENCES

Abdikarim, I. K., Atieno, W. M. C., & Habtu, M. (2017). Prevalence and associated factors of cervical cancer screening among Somali women in an urban settlement in Kenya. *Journal of Community & Public Health Nursing, 42*(5), 912–918. https://doi.org/10.4172/2471-9846.1000159

Abiodun, O. A., Olu-Abiodun, O. O., Sotunsa, J. O., & Oluwole, F. A. (2014). Impact of health education intervention on knowledge and perception of cervical cancer and cervical screening uptake among adult women in rural communities in Nigeria. *BMC Public Health, 14*, 814. https://doi.org/10.1186/1471-2458-14-814

Adewumi, K., Nishimura, H., Oketch, S. Y., Adsul, P., & Huchko, M. (2021). Barriers and facilitators to cervical cancer screening in Western Kenya: A qualitative study. *Journal of Cancer Education, 37*(4), 1122–1130. https://doi.org/10.1007/s13187-020-01928-6

Ampofo, A. G., Adumatta, A. D., Owusu, E., & Awuviry-Newton, K. (2020). A cross-sectional study of barriers to cervical cancer screening uptake in Ghana: An application of the health belief model. *PLOS ONE, 15*(4), e0231459. https://doi.org/10.1371/journal.pone.0231459

Arbyn, M., Weiderpass, E., Bruni, L., de Sanjosé, S., Saraiya, M., Ferlay, J., & Bray, F. (2020). Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *The Lancet Global Health, 8*(2), e191–e203. https://doi.org/10.1016/S2214-109X(19)30482-6

Barasa, E. W., Mwaura, N., Rogo, K., & Andrawes, L. (2017). Extending voluntary health insurance to the informal sector: Experiences and expectations of the informal sector in Kenya. *Wellcome Open Research, 2*, 94. https://doi.org/10.12688/wellcomeopenres.12656.1

Biddell, C. B., Spees, L. P., Smith, J. S., Brewer, N. T., Des Marais, A. C., Sanusi, B. O., Hudgens, M. G., Barclay, L., Jackson, S., & Kent, E. E. (2021). Perceived financial barriers to cervical cancer screening and associated cost burden among low-income, under-screened women. *Journal of Women's Health, 30*(9), 1243–1252. https://doi.org/10.1089/jwh.2020.8815

Black, E., Hyslop, F., & Richmond, R. (2019). Barriers and facilitators to uptake of cervical cancer screening among women in Uganda: A systematic review. *BMC Women's Health, 19*(1), 108. https://doi.org/10.1186/s12905-019-0809-z

Bradford, L., & Goodman, A. (2013). Cervical cancer screening and prevention in low-resource settings. *Clinical Obstetrics and Gynecology, 56*(1), 76–87.

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Bula, A. K., Lee, F., Chapola, J., Mapanje, C., Tsidya, M., Thom, A., Tang, J. H., & Chinula, L. (2022). Perceptions of cervical cancer and motivation for screening among women in rural Lilongwe, Malawi: A qualitative study. *PLOS ONE, 17*(2), e0262590. https://doi.org/10.1371/journal.pone.0262590

Burrowes, S., Holcombe, S. J., Leshargie, C. T., Hernandez, A., Ho, A., Galivan, M., Youb, F., & Mahmoud, E. (2022). Perceptions of cervical cancer care among Ethiopian women and their providers: A qualitative study. *Reproductive Health, 19*(1), 52.

Canfell, K., Kim, J. J., Brisson, M., Keane, A., Simms, K. T., Caruana, M., Burger, E. A., Martin, D., Nguyen, D. T. N., Bénard, É., Sy, S., Regan, C., Drolet, M., Gingras, G., Laprise, J. F., Torode, J., Smith, M. A., Fidarova, E., Trapani, D., Bray, F., … Hutubessy, R. (2020). Mortality impact of achieving WHO cervical cancer elimination targets: A comparative modelling analysis in 78 low-income and lower-middle-income countries. *The Lancet, 395*(10224), 591–603. https://doi.org/10.1016/S0140-6736(20)30157-4

Desta, M., Getaneh, T., Yeserah, B., Worku, Y., Eshete, T., Birhanu, M. Y., Kassa, G. M., Adane, F., & Yeshitila, Y. G. (2021). Cervical cancer screening utilization and predictors among eligible women in Ethiopia: A systematic review and meta-analysis. *PLOS ONE, 16*(11), e0259339. https://doi.org/10.1371/journal.pone.0259339

Ferlay, J., Ervik, M., Lam, F., Colombet, M., Mery, L., Piñeros, M., Znaor, A., Soerjomataram, I., & Bray, F. (2018). *Global Cancer Observatory: Cancer Today*. International Agency for Research on Cancer. https://gco.iarc.fr/today

Ginjupalli, R., Mundaden, R., Choi, Y., Herfel, E., Oketch, S. Y., Watt, M. H., Makhulo, B., Bukusi, E. A., & Huchko, M. (2022). Developing a framework to describe stigma related to cervical cancer and HPV in western Kenya. *BMC Women's Health, 22*(1), 39. https://doi.org/10.1186/s12905-022-01619-y

Gitonga, E., Iseme, R., Mutisya, R., & Kodhiambo, M. (2022). Cervical cancer knowledge, awareness and related health behaviours amongst women of reproductive age in Kiambu County, Kenya: A cross-sectional study. *Health Psychology and Behavioral Medicine, 10*(1), 1056–1070. https://doi.org/10.1080/21642850.2022.2136184

Huchko, M. J., Maloba, M., Nakalembe, M., & Cohen, C. R. (2015). The time has come to make cervical cancer prevention an essential part of comprehensive sexual and reproductive health services for HIV-positive women in low-income countries. *Journal of the International AIDS Society, 18*(Suppl 5), 20282. https://doi.org/10.7448/IAS.18.6.20282

Kasraeian, M., Hessami, K., Vafaei, H., Asadi, N., Foroughinia, L., Roozmeh, S., & Bazrfashan, K. (2020). Patients' self-reported factors influencing cervical cancer screening uptake among HIV-positive women in low- and middle-income countries: An integrative review. *Gynecologic Oncology Reports, 33*, 100596. https://doi.org/10.1016/j.gore.2020.100596

Lim, N. W., & Ojo, A. A. (2017). Barriers to utilisation of cervical cancer screening in Sub-Saharan Africa: A systematic review. *European Journal of Cancer Care, 26*(1), e12444. https://doi.org/10.1111/ecc.12444

Modibbo, F. I., Dareng, E. O., Bamisaye, P., Jedy-Agba, E., Adewole, A., Oyeneyin, L., ... Adebamowo, C. (2016). Qualitative study of barriers to cervical cancer screening among Nigerian women. *BMJ Open, 6*(1), e008533. https://doi.org/10.1136/bmjopen-2015-008533

Morema, E. N., Atieli, H. E., & Onyango, R. O. (2014). Determinants of cervical screening services uptake among 18–49-year-old women seeking services at the Jaramogi Oginga Odinga Teaching and Referral Hospital, Kisumu, Kenya. *BMC Health Services Research, 14*, 335. https://doi.org/10.1186/1472-6963-14-335

Mwenda, M. (2019). Prevalence, barriers and facilitators of cervical cancer screening among women attending gynaecology outpatient clinics in Nairobi County (Master's thesis, University of Nairobi). University of Nairobi Repository. http://erepository.uonbi.ac.ke/handle/11295/108433

Mwenda, V., Mburu, W., Bor, P., Nyangasi, M., Arbyn, M., Weyers, S., Tummers, P., & Temmerman, M. (2022). Cervical cancer programme, Kenya, 2011–2020: Lessons to guide elimination as a public health problem. *ecancermedicalscience, 16*, 1340. https://doi.org/10.3332/ecancer.2022.1340

Ngune, I., Kalembo, F., Loessl, B., & Kivuti-Bitok, L. W. (2020). Biopsychosocial risk factors and knowledge of cervical cancer among young women: A case study from Kenya to inform HPV prevention in Sub-Saharan Africa. *PLOS ONE, 15*(8), e0237745. https://doi.org/10.1371/journal.pone.0237745

Njagi, P., Arsenijevic, J., & Groot, W. (2020). Cost–related unmet need for healthcare services in Kenya. *BMC Health Services Research, 20*, 322. https://doi.org/10.1186/s12913-020-05189-3

Nyangasi, M., Nkonge, N. G., Gathitu, E., Kibachio, J., Gichangi, P., Wamai, R. G., & Kyobutungi, C. (2018). Predictors of cervical cancer screening among Kenyan women: Results of a nested case-control study in a nationally representative survey. *BMC Public Health, 18*(Suppl 3), 1221. https://doi.org/10.1186/s12889-018-6054-9

Ongtengco, N., Thiam, H., Collins, Z., De Jesus, E. L., Peterson, C. E., Wang, T., Hendrix, E., Ndiaye, Y., Gueye, B., Gassama, O., Kasse, A. A., Faye, A., Smith, J. S., Fitzgibbon, M., & Dykens, J. A. (2020). Role of gender in perspectives of discrimination, stigma, and attitudes relative to cervical cancer in rural Sénégal. *PLOS ONE, 15*(4), e0232291. https://doi.org/10.1371/journal.pone.0232291

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Onyango, O. E., Masinde, D., & Ouma, C. (2024). Enhancing cervical cancer knowledge among women of reproductive age: A dialogue-based community health education intervention in rural Kisumu County, Kenya. *BMC Women's Health, 24*, 327. https://doi.org/10.1186/s12905-024-03075-2

Owenga, J. A., & Nyambedha, E. O. (2018). Perception of cervical cancer patients on their financial challenges in Western Kenya. *BMC Health Services Research, 18*(1), 261.

Oyando, R., Were, V., Koros, H., et al. (2023). Evaluating the effectiveness of the National Health Insurance Fund in providing financial protection to households with hypertension and diabetes patients in Kenya. *International Journal for Equity in Health, 22*, 107. https://doi.org/10.1186/s12939-023-01923-5

Page, C. M., Ibrahim, S., Park, L. P., & Huchko, M. J. (2020). Systems-level barriers to treatment in a cervical cancer prevention program in Kenya: Several observational studies. *PLOS ONE, 15*(7), e0235264. https://doi.org/10.1371/journal.pone.0235264

Rositch, A. F., Gatuguta, A., Choi, R. Y., Guthrie, B. L., Mackelprang, R. D., Bosire, R., Manyara, L., Kiarie, J. N., Smith, J. S., & Farquhar, C. (2012). Knowledge and acceptability of Pap smears, self-sampling and HPV vaccination among adult women in Kenya. *PLOS ONE, 7*(7), e40766. https://doi.org/10.1371/journal.pone.0040766

Rosser, J. I., Njoroge, B., & Huchko, M. J. (2015a). Changing knowledge, attitudes, and behaviours regarding cervical cancer screening: The effects of an educational intervention in rural Kenya. *Patient Education and Counseling, 98*(7), 884–889. https://doi.org/10.1016/j.pec.2015.03.017

Rosser, J. I., Njoroge, B., & Huchko, M. J. (2015b). Cervical cancer screening knowledge and barriers to screening among women in rural Kenya: A cross-sectional study. *BMC Women's Health, 15*, 106. https://doi.org/10.1186/s12905-015-0269-0

Singh, S., & Badaya, S. (2012). Factors influencing uptake of cervical cancer screening among women in India: A hospital-based pilot study. *Journal of Community Medicine & Health Education, 2*, 1000157. https://doi.org/10.4172/2161-0711.1000157

Swanson, M., Ibrahim, S., Blat, C., Oketch, S., Olwanda, E., Maloba, M., & Huchko, M. J. (2018). Evaluating a community-based cervical cancer screening strategy in Western Kenya: A descriptive study. *BMC Women's Health, 18*(1), 116.

Wachira, J., Asirwa, F. C., Busakhala, N., Naanyu, V., Kisuya, J., Otieno, G., Keter, A., Mwangi, A., & Inui, T. (2016). Factors associated with uptake of visual inspection with acetic acid (VIA) for cervical cancer screening in Western Kenya. *PLOS ONE, 11*(6), e0157217. https://doi.org/10.1371/journal.pone.0157217

Were, B. N., Mwangi, E. M., & Muiruri, L. W. (2024). Barriers of access to primary healthcare services by National Health Insurance Fund capitated members in Uasin Gishu County, Kenya. *BMC Health Services Research, 24*, 1025. https://doi.org/10.1186/s12913-024-11282-8

World Health Organization. (2018). Cervical cancer: An NCD we can overcome. World Health Organization. https://www.who.int/reproductivehealth/topics/cancers/en/

World Health Organization. (2022). Global Cancer Observatory, 2022. World Health Organization. https://gco.iarc.fr/en

Yimer, N., Mohammed, M., Solomon, K., Tadese, M., Grutzmacher, S., Meikena, H., Alemnew, B., Sharew, N., & Habtewold, T. (2021). Cervical cancer screening uptake in Sub-Saharan Africa: A systematic review and meta-analysis. *Public Health, 195*, 105–111. https://doi.org/10.1016/j.puhe.2021.03.014

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The influence of socio-demographic characteristics on health information needs and accessibility among secondary school students in Morogoro region, Tanzania

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ABSTRACT

The study examined the influence of socio-demographic characteristics on health information needs and accessibility among secondary school students in Morogoro Municipal Council and Ifakara Town Council. The Comprehensive Model of Information Seeking (CMIS) anchored this research. This study adopted a descriptive and analytical research design. The study involved 271 students from 10 secondary schools selected through systematic sampling and 99 key informants chosen purposefully. Data were collected using a structured questionnaire, a key informant interview guide, and a focus group discussion guide. The data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 26. Descriptive statistics, such as frequencies, percentages, and means, were used, and multiple linear regression analysis was conducted. The results indicated that the most highly needed health information was the prevention of sexually transmitted diseases ($\bar{x}$ = 3.79), teeth management and care ($\bar{x}$ = 3.40), and puberty and body changes ($\bar{x}$ = 3.39). Furthermore, the most frequently accessed health information topics were types of food for a balanced diet ($\bar{x}$ = 3.78) and physical exercises ($\bar{x}$ = 3.43). In addition, age, class level, and students' place of residence significantly influenced their health information needs, while age and class level also influenced access to health information. The study concludes that students have moderate access to health information. The study findings underscore the need for targeted interventions, such as the establishment of health clubs in schools and the distribution of sufficient printed materials, to bridge information gaps and ultimately improve adolescent health literacy.

Keywords: Access to Health Information, Health Information Needs, Secondary School Students, Socio-Demographic

I. INTRODUCTION

Health information refers to data and knowledge related to health, including facts about diseases, prevention, treatment, and symptoms (World Health Organization [WHO], 2023). It encompasses a wide range of topics, including nutrition, reproduction, mental health, and others. People of all ages require health information to make informed decisions, particularly when they face disparities, have specific needs, or seek knowledge to complete a task. Therefore, health information plays a crucial role in helping individuals satisfy their informational desires (Waral, 2020). Secondary school students, in particular, have distinct health information needs due to the significant physical, emotional, and social changes they undergo, which often give rise to unique health-related concerns (WHO, 2022). Their needs typically include topics such as puberty, sexual and reproductive health, mental health issues like stress, anxiety, and depression, nutrition, physical fitness, and substance use (including drugs, alcohol, and tobacco). Addressing the health information needs of secondary school students is crucial, as it enables them to make informed decisions and supports their overall well-being (Ngissa *et al.*, 2024).

Secondary school students face various health-related issues that affect their physical, emotional, and mental well-being (WHO, 2023). Mental health challenges, substance use, and unhealthy habits like poor diet and limited physical activity are growing concerns among adolescents (National Institute on Drug Abuse [NIDA], 2022; Centers for Disease Control and Prevention [CDC], 2023). They are also vulnerable to sexual and reproductive health problems, including exposure to STIs and unintended pregnancies (WHO, 2022). One way to reduce these challenges is by enhancing students' access to health information. Secondary school students in developed countries generally have better access to health information due to the widespread availability of the internet, the strong integration of health education into school curricula, and high digital literacy (Organization for Economic Co-operation and Development [OECD], 2021). In contrast, many secondary school students in developing countries face limited access to accurate and age-appropriate health information (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021).

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In Tanzania, despite various efforts to fulfil the information needs of adolescent students, studies show a high incidence of health risk behaviours such as early pregnancy, sexually transmitted diseases, substance use, and others (Gift & Mweya, 2024; Mavura *et al*., 2022; Ngissa *et al*., 2024). The report by Human Rights Watch highlighted that many girls and young women in Tanzania have minimal access to quality sexual and reproductive health education in schools (Human Rights Watch [HRW], 2017). Moreover, often leads to unintended pregnancies, school dropouts, and a general lack of awareness about reproductive rights and health services. In addition, a study by Msovela *et al*. (2025) revealed that many adolescent girls had limited knowledge about puberty and menstruation. This can be improved by enhancing girls' access to the information they need.

Access to needs-based health information is a crucial factor influencing the health behaviours of secondary school students worldwide (WHO, 2022). When students effectively acquire and utilise health information, they become more aware and empowered to make informed decisions that enhance their overall well-being. However, access to and engagement with this information are shaped by various socio-cultural, economic, and institutional factors, such as norms, financial barriers, the quality of education, and the availability of youth-friendly health services (Anasi & Adediji, 2016; Oyedokun-Adebagbo *et al*., 2023). These barriers underscore the importance of implementing comprehensive approaches to improve health information accessibility for students.

Research consistently highlights the influence of socio-demographic characteristics on students' ability to access and utilise information. Variables such as age, academic level, sex, digital literacy, and parental support significantly shape how students seek and engage with information (Adeniyi *et al*., 2022; Folorunso & Olaniyi, 2020; Kavitha & Chandrashekara, 2022; Wilder, 2023). For instance, students with higher digital competence or supportive family environments are generally better equipped to find and use information effectively. In light of this, the present study aims to examine the specific health information needs of secondary school students in Tanzania and how socio-demographic factors influence these needs.

1.1 Statement of the Problem

Secondary school students need access to reliable health information to support healthy behaviors and informed choices (Ngissa *et al*., 2024). However, research in Tanzania indicates they face significant barriers in obtaining such information (HRW, 2017). Socio-demographic factors, such as age, sex, and education level, often limit access to health resources (MoEST & Ministry of Health, 2021; Mbatia, 2024; Rahayu *et al*., 2024). This lack of access has contributed to rising unhealthy behaviours such as substance abuse, early sexual activity, and increased cases of STIs and unintended pregnancies (WHO, 2022; Mavura *et al*., 2022).

Several studies worldwide have examined the information needs and accessibility among secondary school students, including work by Otoide (2015), Hamilton-Ekeke *et al*. (2020), and Lee *et al*. (2021). These studies have explored areas such as students' information literacy, access skills, and sources of information on sexual and reproductive health. In Tanzania, similar research has been conducted to assess knowledge levels and access to health information among secondary school youth. For example, studies have addressed topics like sexually transmitted infections, sexual behaviours, family planning, and menstruation (Ayubu & Kabeya, 2019; Msovela *et al*., 2024). Collectively, this body of research highlights the ongoing challenges and varying levels of access to essential health information among adolescents. None of the existing studies has examined how socio-demographic factors influence health information needs and accessibility among secondary school students. This study addresses that gap by exploring these factors, aiming to inform targeted interventions and improve adolescent health literacy, ultimately reducing health-risk behaviours and supporting more effective health education programs.

1.2 Research Objectives

i. To assess the accessibility of health information to secondary school students.
ii. To determine the influence of socio-demographic characteristics on health information needs among secondary school students.
iii. To establish health information needs among secondary school students.
iv. To examine the influence of socio-demographic characteristics on health information accessibility among secondary school students.

II. LITERATURE REVIEW

2.1 Theoretical Review

Since this study aims to assess how socio-demographic factors influence students' health information needs and accessibility, the Comprehensive Model of Information Seeking (CMIS) was found to be both relevant and applicable. The model has been widely applied in both educational and health communication contexts, making it a strong theoretical foundation for analyzing information access among adolescents. Several studies have successfully

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employed CMIS to explore how individuals interact with health information, particularly about socio-demographic variables (Yang *et al*., 2023; Xu *et al*., 2025; Jiang *et al*., 2022; Fetherston, 2019; Kassim & Katunzi-Mollel, 2020; Ferraris *et al*., 2023). These studies provide empirical support for the model's effectiveness in understanding the relationship between personal background and information behavior, which is central to the focus of this research.

Since the study aims to assess how socio-demographic factors influence students' health information needs and accessibility. The Comprehensive Model of Information Seeking is found to be relevant and applicable**.** This model has been used in both educational and health contexts (Yang, Q., *et al*., 2023; Xu, *et al*., 2024; Jiang, *et al*., 2022; Fetherston, 2019; Kassim, & Katunzi-Mollel, 2020; Ferraris *et al*., 2023).

The Comprehensive Model of Information Seeking (CMIS) is a theoretical framework designed to predict how individuals seek information, particularly in response to health-related concerns. The model comprises three primary components: Antecedents, Information Carrier Characteristics, and Information Seeking Actions (Basnyat *et al*., 2018). Antecedents include factors such as demographics, personal experiences, the salience of the health issue, and individual beliefs. These elements influence an individual's predisposition to seek information. Information Carrier Characteristics pertain to the attributes of the information sources, including their credibility, accessibility, and perceived usefulness. Finally, Information Seeking Actions describe the behaviors individuals engage in to acquire information, characterized by the scope, depth, and method of the search (Yang *et al*., 2023).

CMIS is particularly suitable for this research because it emphasizes the role of antecedent factors such as demographics, personal experiences, beliefs, and the perceived relevance of the health issue in shaping an individual's motivation to seek information. These components align closely with the objectives of this study, which seeks to understand how characteristics such as age, sex, income level, and educational background affect students' information-seeking behavior. In the context of secondary students, the CMIS will be applied to understand how students' and parents' characteristics influence their health information-seeking behaviors.

2.2 Empirical Review

2.2.1 Health Information Needs among Secondary School Students

Various studies from different parts of the world have been conducted to assess the health information needs of adolescent students in secondary schools, highlighting a consistent demand for accurate and accessible information across diverse health topics. For instance, Holtman *et al*. (2024) revealed that female students most commonly seek health information related to menstruation, contraception, sexually transmitted infections (STIs), and pregnancy. These areas are often underrepresented in formal education, leading many students to rely on informal or unreliable sources, which may increase the risk of misinformation and poor health outcomes.

In a related study, Martinović *et al*. (2021) found that adolescent girls also express a strong need for information on general health topics such as nutrition, disease prevention, mental health issues like depression, romantic and peer relationships, sexual behaviour, and substance use, particularly alcohol. This suggests that their health concerns extend beyond reproductive health and encompass a wide range of physical, emotional, and social well-being.

Furthermore, Shrestha *et al*. (2024) explored the perceived need for sexual and reproductive health services among higher secondary school students. They found that while many adolescents recognized the importance of such services, actual utilization was low due to barriers like stigma, limited youth-friendly facilities, and lack of privacy. These findings underscore the importance of providing comprehensive, age-appropriate, and culturally sensitive health education and services that address the diverse needs of adolescent girls and empower them to make informed decisions about their health.

Although numerous studies have explored the information needs of students in secondary schools, many of these investigations have primarily focused on identifying the types of information sought by students. However, they often overlook a critical dimension: the underlying characteristics of the students that may influence their perceived need for such information. Factors such as age, class, and parental occupation can significantly shape what students believe they need to know, but fail to address the root causes that drive information needs among adolescent students.

2.2.2 Accessibility to Health Information among Secondary Students

Several studies have been conducted to evaluate the accessibility of health information among secondary school students, particularly in the area of sexual and reproductive health. Understanding how adolescent students access and engage with such information is crucial, as it directly influences their health literacy, decision-making, and overall well-being. For instance, the study by Gondim *et al*. (2015) observed that the adolescents involved had relatively good access to educational activities focused on sexual and reproductive health. Notably, schools were identified as the primary and most reliable source of this information. This finding underscores the important role that formal education systems play in disseminating health-related knowledge to young people, especially in structured environments where accurate information can be delivered consistently.

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Ito et al. (2022) found that access to health information among adolescent students was generally limited. Their study revealed that while there was some awareness, significant gaps remained, particularly due to insufficient communication channels and cultural taboos surrounding reproductive health topics. The influence of family, especially parents, was also noted as a key factor influencing accessibility. The study emphasized the need for greater involvement of both parents and educators in the health education process.

Similarly, Tonsing (2022) examined the accessibility of COVID-19 information among students with communication needs. Their findings indicated that few students were well-informed about COVID-19, such as its nature, modes of transmission, and prevention strategies. There was a significant lack of access among students with communication needs. These points highlight the need for more comprehensive health education programs that cater to a diverse range of users.

Additionally, Msovela *et al*. (2025) conducted a study focusing on adolescents' knowledge of puberty and menstruation. Their research highlighted that many young girls still possess a limited understanding of these fundamental biological processes. Despite some efforts to educate students through school-based programs, the study emphasized that misinformation, stigma, and lack of parental guidance continue to hinder effective learning in this area.

Although various studies have assessed the accessibility of health information among students in secondary schools, they have not examined the characteristics of the students. These characteristics could significantly influence their access to such information.

2.2.3 Socio-Demographic Factors Influencing Health Information Needs among Secondary School Students

The review of related literature reveals that various studies have examined socio-demographic factors influencing health information needs among secondary school students in different parts of the world. Age significantly influences health information priorities and needs among students. Research indicates that younger adolescents gravitate toward general health topics, while older youths tend to focus more on personal health matters (Pendl *et al.*, 2024; Anne-Laure *et al*., 2024). As adolescents grow older, their interest in sexuality issues increases, often inversely related to their engagement with broader topics such as pandemics and environmental health during early adolescence (Anne-Laure *et al*., 2024; Martinović *et al*., 2021; Spinelli & Martinovich, 2024). This shift underscores the necessity for age-appropriate health information that aligns with the evolving interests of adolescents.

Sex also plays a critical role in shaping health information needs. Females tend to show a heightened interest in mental health and relational topics, while males focus more on physical health issues. Research highlights that girls are particularly interested in discussions surrounding sleep, mental health, violence, and social life (Nash *et al.,* 2019). These sex disparities indicate that health education programs must consider specific interests and concerns relevant to each sex to be effective.

2.2.4 Socio-Demographic Factors Influencing Health Information Accessibility among Secondary School Students

The review of related literature shows that various studies have examined socio-demographic factors influencing health information accessibility among secondary school students in different parts of the world. Higher grades or classes have been valued as a means for increasing knowledge about health topics and enhancing critical awareness of health issues. Individuals with higher education levels tend to have better access to and utilization of health information, as their educational attainment is associated with improved literacy and a greater ability to navigate complex information sources (Mishra & Mukhopadhyay, 2021). Consequently, secondary school students at higher levels often exhibit superior reading and writing proficiency compared to their lower-level peers, enabling them to process intricate health information from diverse formats. Therefore, numerous studies have demonstrated a relationship between information accessibility and users' educational levels (Oyedokun-Adebagbo *et al*., 2023).

Age positively influences the accessibility of health information. The older students have greater access to health information. Older students tend to be more mature and are more likely to be aware of and utilize various sources of information, thereby increasing their chances of accessing health-related content. Fastrich *et al*. (2024) found that an increase in student age is associated with a higher ability to search for and retrieve information.

Second, Jatu *et al.,* (2024) revealed that students in higher grades demonstrated better information access and evaluation skills compared to those in lower grades. In addition, Lugard (2023) found that students in higher grades exhibited greater ICT awareness and usage than their counterparts in lower grades. This trend was attributed to increased exposure to ICT resources and more opportunities to integrate technology into their learning processes. Greater access to ICT resources may, in turn, enhance access to various types of information, including health-related information.

A study by Chekol *et al.* (2023) revealed that boys scored higher in most domains of information search than girls. Males have higher levels of access because male students are active in discussing or seeking information about

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health, particularly topics related to sexual and reproductive health. Parental education and economic status are also notable predictors of health information access. Students from higher socioeconomic backgrounds typically have more access to health literacy resources, thereby enhancing their ability to make informed health decisions (Duplaga & Grysztar, 2021). The home environment, including available resources, has a significant impact on students' health literacy, underscoring the need for community-based initiatives that address educational inequalities. This was reported in a study by Pendl *et al.* (2023).

Geographic disparities are pronounced, with students in rural areas of Ghana facing significant barriers in accessing online health resources due to a lack of awareness (Sambah *et al.*, 2023). Despite the fact that various socio-demographic factors, such as age, socioeconomic status, cultural background, and educational level, have been acknowledged in the literature as playing a significant role in influencing students' information needs and accessibility, there remains a notable gap in empirical research. Specifically, there is a lack of studies that explore how these socio-demographic characteristics of both students and parents influence the perceived health information needs and accessibility of secondary school students. This gap in research is particularly relevant in the context of Tanzania, where socio-demographic factors of students and parents can affect how health information is accessed. Understanding these influences is crucial to designing more effective, targeted health education interventions that address the unique needs of secondary school students

2.3 Conceptual Framework

The conceptual framework is based on a single theory: the Comprehensive Model of Information Seeking (CMIS). The framework includes both independent and dependent variables. The independent variables are the socio-demographic characteristics of the students. However, they also include residency and parental education, as they influence both access to and the perceived information needs of the students. The dependent variables are the student's health information needs and their access to health information. These factors can influence how students perceive and access health information. For instance, younger students may have different health information needs compared to older students, and those from higher socioeconomic backgrounds may have better access to resources. Students with more educated parents might be more skilled at locating and understanding health information, whereas those in rural areas may face challenges due to limited access.

Moreover, the study assumes that students perceived health information needs vary significantly based on these demographic and socioeconomic factors. Older students and those in higher classes often have greater access to health information and may take more personal responsibility for their health. Females may have higher health information needs than males, especially in areas like menstrual health, nutrition, and emotional well-being, influenced by both social and biological factors. Additionally, students whose parents work in education or health-related fields are more likely to have their health information needs effectively met, due to greater access to accurate guidance. In contrast, students from families with low literacy levels may have greater unmet health information needs, often due to a lack of awareness or limited access to trustworthy sources.

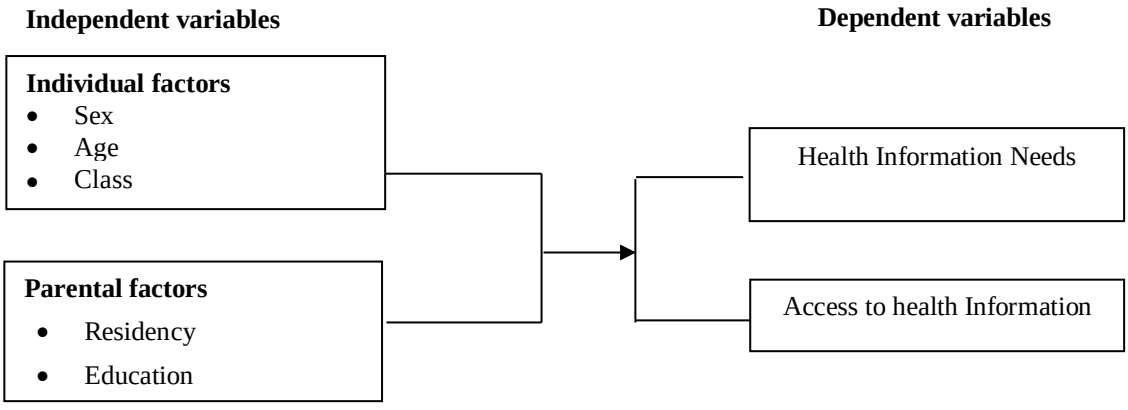

Figure 1
Conceptual Framework

III. METHODOLOGY

3.1 Study Area

The study was carried out in the Morogoro Region, which was selected due to the low access to health information among secondary school students (León-Himmelstine *et al.*, 2021; Kavana, 2021; Msollo & Majaliwa,

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2025). Furthermore, two districts, namely Morogoro Municipality and Ifakara Town Council, were selected. Morogoro Urban features a more economically diverse population, including students from both high- and low-income families. The Ikafara Town Council District includes many students from lower socioeconomic backgrounds, often in remote areas, including both districts will ensure representation of students with both features.

3.2 Research Design

This study adopted a descriptive and analytical research design. A descriptive design was used because it allows for a clear understanding of the current situation, such as the percentage of students accessing health information and the extent of their information needs. In addition, an analytical design was employed to explore the relationships between variables. This approach was chosen because the study aims to answer the 'why' and 'how' specifically, how socio-demographic factors influence access to health information and perceived information needs.

3.3 Study Population, Sampling, and Sample Size

The study population refers to the targeted group from which the sample is drawn (Upadhyay, 2023). This study targeted secondary school students from selected schools within the study area. Both probability and non-probability sampling techniques were employed, specifically purposive sampling, simple random sampling, and systematic random sampling. A total of 271 secondary school students were selected through simple random sampling from a pool of 4 752 students across 10 schools, ensuring proportional representation from each selected school. Systematic sampling was also applied to maintain proportionality based on the size of each school.

3.4 Data Collection Methods

The study used both quantitative and qualitative methods in collecting data. Mixed methods procedures employ aspects of both quantitative methods and qualitative procedures (Stadtlander, 2009). Quantitative data were collected using a structured questionnaire designed to assess student's health information needs and accessibility. The questionnaire included closed-ended questions. Interviews with open-ended questions were used to capture qualitative insights from 99 teachers, and focus group discussions were used to collect data from 6 participants at each school. Prior to data collection, the instrument was pre-tested on 30 respondents. The results of Spearman–Brown split-half Cronbach's alpha were 0.83, which is higher than the minimum recommended reliability score of 0.7 as per Hair *et al*. (2010).

3.5 Data Collection Instruments

This study employed structured questionnaires, a focus group discussion guide, and interviews with key informants. The structured questionnaire was used to enable the collection of data from a large sample of respondents. It was supplemented by focus group discussions, which allowed for deeper explanations and insights from participants. Additionally, interviews with teachers were conducted to triangulate the data and enhance the credibility of the findings.

3.6 Data Analysis

Qualitative data was analyzed using thematic analysis. Quantitative data was coded and analyzed through the Statistical Package for Social Science (SPSS) version 26. To analyze information needs and accessibility of secondary school students: Descriptive statistics, which include the mean ($\bar{x}$), were used to analyze the information needs and accessibility. Furthermore, One-way Analysis of variance was used to determine significant differences in the mean of health information needs, followed by Duncan Multiple Range Test (DMRT) for mean separation. To analyze the influence of social demographic characteristics on secondary school students information needs: The multiple linear regression equation used for analysis was as follows:

$$Y = \beta 0+\beta 1X1+ \beta 2X2+\ldots+\beta 5X5.$$

Where; Degree of needed information (summated score of the respondent's information needs scores). The summated was obtained by summing up the individual responses for all the 16 items contained on the list.

β= Regression Coefficients.β0= Intercept.

X1 …X4 are explanatory variables (Sex (0=Female, 1=Male), Age (Years), form (1, 2, and 3), Residence (0=within, 1=Outside), Education of head of household (1=Primary, 2=Secondary, 3=Certificates, 4=Diploma, 5=Bachelor),

To analyze the influence of social demographic characteristics on secondary student health information accessibility: The multiple linear regression equation used for analysis was as follows: $Y = \beta 0+\beta 1X1+ \beta 2X2+\ldots+\beta 4X4$.

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Where, Y=Degree of Information accessibility (summated score of the respondent's information accessibility scores). The summated was obtained by summing up the individual responses for all 16 items contained on the list.

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In addition, prior to using linear regression, the multicollinearity assumption was checked using the variance inflation factor (VIF), and autocorrelation was computed. Meanwhile, the qualitative data were analyzed using thematic analysis, a method that involves identifying, analyzing, and reporting themes within the data.

Table 1

Socio-Demographic Characteristics on Health Information Needs and Accessibility

Variables	Variable description	Expected outcome
Dependent variables	Health Information Needs Health Information Access	+/-
Independent variables	Social demographic characteristics 1. Age 2. Gender 3. Form 4. Residence 5. Head of households 6. Education level of Head of households 7 Occupation of head of household	+/-

IV. FINDINGS & DISCUSSION

4.1 Socio Demographic Characteristics of the Respondents

The socio-demographic characteristics of the respondents reveal critical insights regarding the sample population of secondary school students in the study area. The results were presented in Table 2.

Table 2

Socio-Demographic Characteristics (n=271)

	Categories	N	%
Sex	Male	108	39.8
	Female	163	60.2
Age	13 - 15	66	24.4
	16 - 18	195	72.0
	19 - 23	10	3.7
Form	Two	103	38.0
	Three	79	29.2
	Four	89	32.8
Residence	Inside the local area	170	62.7
	Outside the local area	101	37.3
Head of household	Father	211	77.9
	Mother	51	18.8
	Guardian	9	3.3
Education level of the head of household			
	Primary	32	11.8
	Secondary	52	19.2
	Certificate	32	11.8
	Diploma	42	15.5
	Bachelor	113	41.7
Occupation of head of household	Casual laborer	9	3.3
	Farmers	45	16.6
	Business	93	34.3
	Employed	124	45.8

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The results showed that about 60.2% were girls while only 39.8% were boys. Moreover, the age distribution shows that of all the students, 72% are between 16 and 18 years old, while those aged between 13 and 15 years were 24.4% (Table 1).

Besides, the educational levels of the parents surveyed ranged from primary education to bachelor's degrees. The results indicated that 41.7% of students had their head of household attain secondary education, 15.5% of the parents held a diploma, while only 11.8% had completed only primary education. Furthermore, the study also assessed the residence of the students. The results revealed that more than half (62.7%) were residing within the local area, while only 37.3% were residing outside the local area.

In addition, the results showed that less than half (45.8%) of the students had parents who were employed, while 34.3% engaged in business, and only 3.3% participated in casual labor activities to earn income. The study included students from Form Two, Three, and Four. The results showed that 38.0%, 29.2%, and 32.8% of students were from Form Two, Three, and Four, respectively. The results indicate that there is a relatively similar proportional distribution of students across each class.

4.1.1 Health Information Needs of Secondary Schools' Students

The results in Table 2 show the mean scores for the types of health information needed by the respondents. The highest mean score was for information on the prevention of sexually transmitted diseases ($\bar{x}$ = 3.79). This was followed by information related to teeth management and care ($\bar{x}$ = 3.43), and puberty and body changes ($\bar{x}$ =3.39). Other important health information included early pregnancy prevention and the prevention of communicable diseases, both with a mean score of 3.38. Additionally, respondents indicated a need for information on types of food for a balanced diet ($\bar{x}$ = 3.10) and types of physical exercises for obesity prevention ($\bar{x}$ = 3.12).

During the FGD, one student pointed out that:

> *There are changes we observe in our bodies; for instance, some experience stomachaches while others don't. We are uncertain about these changes, and even if you ask a colleague, they might say, 'I don't understand it well either.'*

Similarly, FGDs revealed that:

> *Students wanted information on sexually transmitted diseases to protect themselves. Those in biology classes accessed this through lessons, while others had limited access due to a lack of coverage in their subjects.*

Table 3

Type of Health Information Needed among Secondary Schools' Students

Type of information needed	$\bar{x}$
Types of food for a balanced diet	3.10c
Types of physical exercises for obesity prevention	3.12c
Stress management techniques	3.27bc
Prevention of Sexually transmitted diseases	3.79a
Early pregnancy prevention	3.38bc
Information on the prevention of communicable diseases	3.38bc
Substance abuse prevention and support	3.28bc
Sleep hygiene and resting	3.31bc
Understanding common illnesses and symptoms, and treatment	3.34bc
Immunization requirements and resources	3.35bc
Access to confidential health services	3.32bc
Drug abuse prevention and support	3.33bc
Transmission of sexually transmitted diseases	3.37bc
Personal hygiene	3.36bc
Teeth management and caring	3.43b
Puberty and body changes	3.39bc

Mean with same superscript are not significant different at p>0.05, $F_{15, 5316}$ 0.05=2.93, p=0.00

4.1.2 Socio-Demographic Influencing Health Information Needs among Secondary Schools' Students

Table 4 shows the influence of selected demographic characteristics on the student's information needs. The model included the sex, age, grade, residence, and education level of the head of household. The variation inflation factor (VIF) ranged from 1.068 to 1.446, which is lower than the minimum recommended VIF as recommended by Pallant *et al*. (2014). The results ranged from implying that the results do not have the problem of multicollinearity. In addition, Durbin Watson results were 1.63, which falls within the recommended range of 1.5 and 2.5, implying that

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the results do not have autocorrelation (Kutner *et al*., 2022). Moreover, the coefficient of variation was 0.225, implying that the selected demographic characteristics of the respondent explained 22.5% of the information needs.

Table 4

Regression Results on Socio-Demographic Factors Influencing Health Information Needs

Factor	Unstandardized coefficients		Standardized coefficients	t	P value	Collinearity statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	125.538	12.629		9.941	.000		
Sex	3.563	2.066	.098	1.724	.086	.903	1.107
Age	-4.210	.824	-.332	-5.106	.000	.691	1.446
Grade	-4.021	1.302	-.196	-3.087	.002	.726	1.377
Residency	4.892	1.999	.137	2.447	.015	.931	1.075
Education of the head of household	-.543	.654	-.046	-.830	.407	.936	1.068

R^2=0.225, p=0.00; Durbin-Watson=1.63

The beta coefficient for age was 4.21, and the variable is statistically significant (p<0.05). This means that a unit increase in age lowers the perceived information needs by 1 score. Furthermore, the class of the student influenced the information needs. The results show that the variable has a beta coefficient of 4.02, and it was statistically significant (P<0.05). This means that a unit increase in grade of the students reduces the information needs score by 4.02. The student's residence influenced the information needs. The variable has a beta coefficient of 4.892. Means that, respondents residing outside the locality have 4.89 higher information needs score than these residing within the locality.

The sex variable had a positive beta coefficient, implying that boys had higher health information needs than girls. However, this relationship was not statistically significant (p > 0.05). Similarly, the education level of the parents had a negative beta coefficient (β = -0.543), indicating that an increase in parental education was associated with a decrease in students' health information needs. Nevertheless, this variable was also not statistically significant (p > 0.05).

4.1.3 Health Information Accessibility among Secondary Schools' Students

Table 5 presents the mean scores for health information accessibility on various topics.

Table 5

Health Information Accessibility

Type of Information accessibility	$\bar{x}$
Types of food for a balanced diet	3.78a
Types of physical exercises for obesity prevention	3.43b
Stress management techniques	3.38b
Prevention of Sexually transmitted diseases	3.13c
Early pregnancy prevention	3.31bc
Information on the prevention of communicable diseases	3.27bc
Substance abuse prevention and support	3.37bc
Sleep hygiene and resting	3.38bc
Understanding common illnesses and symptoms, and treatment	3.37bc
Immunization requirements and resources	3.35bc
Access to confidential health services	3.37bc
Drug abuse prevention and support	3.32bc
Transmission of sexually transmitted diseases	3.31bc
Personal hygiene	3.34bc
Teeth management and caring	3.24c
Puberty and body changes	3.27bc

Means with the same superscript are significantly different at p<0.05.

$F_{15, 4316}$ 0.05=2.5043, p=0.001.

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As shown in Table 5, the mean score for access to information about types of food for a balanced diet was 3.78. For physical exercises in the prevention of obesity, the mean score was 3.43. Access to health information on stress management techniques had a mean score of 3.38, while substance abuse prevention and support scored 3.37. The mean score for access to information on the prevention of sexually transmitted diseases (STDs) was 3.13, and for puberty changes, it was 3.27.

During the FGD, one student pointed out that

> "*There is a sports session once a week, during which the sports teacher teaches us various exercises, such as how to build muscles and reduce weight*.

This was confirmed by FGDs, where students indicated ‘’they were taught topics related to nutrition and balanced diets in biology classes by their teachers.’’

4.1.4 Socio-Demographic Influencing Health Information Accessibility among Secondary Schools’ Students

The results showed that the Variance Inflation Factor (VIF) ranged from 1.11 to 1.45, which is below the threshold of 10, indicating that there was no multicollinearity problem, as recommended by Hair *et al*. (2010). In addition, the Durbin-Watson value was 1.71, which falls within the acceptable range of 1.5 to 2.5, implying that there was no autocorrelation problem in the data (Kutner *et al*., 2022). The coefficient of determination (R^2) was 0.195, implying that the selected independent variables included in the model explained 19.5% of the variation in accessibility to health information among secondary school students.

Table 6

Regression Results on Socio-Demographic

Factor	Unstandardized Coefficients		Standardized Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	24.280	8.450		2.873	.004		
Sex	-1.219	1.383	-.056	-.882	.379	.903	1.107
Age	.133	.552	.018	6.240	.000	.691	1.446
Class level	1.284	.871	.105	4.474	.001	.726	1.377
Residency	-1.444	1.338	-.068	-1.080	.281	.931	1.075
Education of the head of household	.061	.437	.009	.139	.889	.936	1.068

R^2=0.195, p=0.00; Durbin-Watson=1.71

Age had a positive beta coefficient of 0.13, and the variable was statistically significant ($p < 0.05$). This means that for every one-unit increase in age, the health information accessibility score increased by 0.133. Likewise, the class level of the students significantly influenced their access to information, with a beta coefficient of 1.28, and the variable was statistically significant ($p <0.05$). This implies that students in higher classes had greater access to health information.

Similarly, the sex has a negative beta coefficient of -1.22. This implies that female students had higher levels of access to health information compared to their male counterparts. However, the variable was not statistically significant ($p > 0.05$), suggesting that the difference in access between male and female students may be due to chance.

In addition, the education level of the head of household has a positive beta coefficient of 0.06, indicating a positive relationship between parental education and students' access to health information. However, the variable was not statistically significant ($p > 0.05$). The results of the regression analysis revealed that the student's place of residence had a negative beta coefficient of -1.44. This implies that students residing outside the study area or school locality had lower access to health information by approximately 1.44 units compared to those residing within the area. However, this relationship was not statistically significant ($p > 0.05$), indicating that place of residence may not be a predictor of access to health information among secondary school students.

4.2 Discussion

4.2.1 Socio Demographic Characteristics of the Respondents

The distribution indicates a more than half (60.2%) were girls. The implication here is that in the study area, there were more girl’s students than male students. This significant predominance of female students reflects broader educational trends, where girls have increasingly higher enrollment rates than boys (World Bank, 2022). Several factors contribute to this occurrence. Firstly, various national and local initiatives promoting gender-equal opportunity in education have played a pivotal role. Conversely, the dropout rate for boys by 55.2%, which is notably

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higher than that of girls in Tanzania (The Chanzo, 2023). Causative factors to this trend may include socioeconomic pressures that compel boys to enter the labour force early to support their families and cultural perceptions that prioritize boys' participation in paid labour over their continued education. The Regional Statistics for Morogoro verify that more than half of the secondary school students are girls, emphasizing the continuing changes in school demographics (URT, 2023). These results are similar to the Regional Statistics in Morogoro, which indicated that more than half of the secondary school students were girls (URT, 2023).

Additionally, the age distribution shows that the majority of the students (72%) are between 16 and 18 years old (Table 1). This implies that most of the respondents were in their adolescent years. This age distribution aligns with Tanzania's education policy, which allows children to start grade one at the age of six. As a result, they typically complete class seven between the ages of 13 and 14, and then proceed to secondary school. Adolescents are generally more active and therefore require access to health information to make informed decisions. This finding is similar to a previous study by Pezzullo (2022), which revealed that most secondary school students are between 13 and 17 years old.

Furthermore, the results indicated that more than two-thirds (41.7%) of students indicated that their head of household had attained secondary education, while only 11.8% had completed only primary education. These findings suggest that a majority of the parents possess a relatively high level of education. As such, they may be more likely to be informed and capable of guiding their children, particularly in accessing reliable health information. Educated parents are generally more aware of the importance of health literacy and can play a key role in supporting their children in making informed decisions regarding their well-being. Parental involvement and support can have a positive influence on adolescents' ability to seek, understand, and apply health-related knowledge. Notably, these results differ from the findings of Ndijuye and Dadi (2024), who reported that most household heads in their study had only primary or secondary education. This contrast may be due to differences in the demographic or geographical characteristics of the study populations.

Likewise, the findings showed that more than half (62.7%) were residing within the local area. The dominance of students residing within the local area is due to the establishment of ward-based secondary schools, which accommodate students who passed from primary schools within the same area. However, there were also nearby villages and boarding schools that hosted students coming from further locations. This finding is similar to a previous study by Rashidi (2015), which indicated that the introduction of ward-based secondary schools improved transition rates from primary to secondary education, reducing the need for students to travel long distances to access secondary education.

Moreover, less than half (45.8%) of the students indicated that their parents were employed. These results imply that most of the respondents come from families with reliable sources of income. The income status of parents influences their ability to provide support to students in various areas, including access to different sources of information. Therefore, financially stable parents are more likely to support their children in accessing information, including health-related information, thus fulfilling their information needs. This finding is similar to the study by Boateng *et al*. (2021), which revealed that the major sources of income for parents were formal employment, small businesses, and agriculture.

With regard to class, the results showed that 38.0%, 29.2%, and 32.8% of students were from form two, three, and four, respectively. The results imply that there is a relatively similar proportional distribution of students across each class. Since the sampling was proportional, this implies that the number of students in each class does not have significant differences. Likewise, with regard to the household head, the results showed that most students (77.9%) live in families headed by the father, while few (3.3%) live with a guardian. This result is likely influenced by African traditions, which recognize the father as the head of the household. In families with both mother and father, shared responsibilities enhance child care, which increases the likelihood of students accessing information from their parents.

4.2.2 Health Information Needs of Secondary Schools Students

The highest mean score was for information on the prevention of sexually transmitted diseases ($\bar{x}$ = 3.79). This implies that the most highly needed health information among students was related to the prevention of sexually transmitted infections (STIs). This may be because most secondary school students are at adolescence, a stage characterized by significant physical and emotional changes. These changes can lead to increased curiosity and, in some cases, engagement in sexual activity. Therefore, students need to receive accurate and age-appropriate information on how to protect themselves from sexually transmitted infections, which pose serious health risks to sexually active individuals. The findings imply that there is a critical need to develop and implement awareness campaigns and health education programs that specifically address sexual health among secondary school students. This is consistent with the findings of Shrestha *et al.* (2024) and Saraipour *et al*. (2025), who also reported that

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information on the prevention of sexually transmitted diseases was among the most needed health topics for secondary school students.

The second most needed health information among secondary school students was related to teeth management and care ($\bar{x}$=3.43). This indicates that students are seeking information on how to properly take care of their teeth. This finding may be attributed to the fact that many adolescents frequently consume sugary foods such as sweets and snacks, which contribute to dental problems. As a result, a significant number of students suffer from tooth decay or broken teeth that are often left untreated or unreplaced. These findings are supported by studies conducted by Essén *et al*. (2019) and John Bayingana *et al*. (2024), which reported that the third most needed health information among secondary school students was related to puberty and body changes ($\bar{x}$=3.39). This topic was highly needed due to the fact that most secondary school students are in the adolescent stage with significant physical and emotional changes as they transition from childhood. At this age, students are curious and eager to learn about the changes they are experiencing. Therefore, they require accurate information to help them understand these changes and make informed decisions. Additionally, in many communities, myths and misconceptions about puberty are common, which can lead to confusion or misinformation among adolescents.

This implies that there is a lack of accurate and accessible puberty health information among adolescents**.** These findings are consistent with the study by Martinović *et al*. (2021), which revealed that information about puberty was among the most highly needed health topics for secondary school students.

The fourth most needed health information topics were early pregnancy prevention and the prevention of communicable diseases, both with a mean score of 3.38. Students expressed a need for information on early pregnancy prevention for both boys and girls because they are at an age where physical and emotional changes may influence them to engage in sexual activity. One of the major consequences of this behavior is unwanted pregnancy, which can lead to school dropout and social stigma for the affected students and their families. Therefore, students need accurate information on how to prevent early pregnancy to protect their health, continue their education, and avoid social consequences. Additionally, students indicated a need for information on the prevention of communicable diseases. This is likely due to the increasing prevalence of such diseases, which can be easily transmitted from infected to uninfected individuals. Understanding how to prevent these diseases is essential for maintaining personal and public health. These findings are consistent with studies conducted by Holtman *et al*. (2024) and Abdissa (2021), which also reported that secondary school students highly needed information on early pregnancy and communicable disease prevention.

Moreover, the least needed health information topics were the types of food for a balanced diet and types of physical exercises for obesity prevention, with mean scores of 3.10 and 3.12, respectively. This implies that students did not consider these types of health information a priority. This could be due to the availability of such information within their locality or school environment. It also implies that existing school-based nutrition and physical education programs are effectively reaching students, at least in terms of perceived exposure and awareness. Additionally, programs that promote various physical activities may be contributing to students' confidence and engagement in physical exercise.

4.2.3 Socio-Demographic Characteristics Influencing Health Information Needs Secondary Schools' Students

First, age was a factor that influenced health information needs. The older students have lower health information needs compared to the younger ones. A possible explanation for this could be that as age increases, students gain greater awareness of various sources of information, which helps them meet their health information needs more effectively. These findings are consistent with the study by Hamilton-Ekeke *et al*. (2020), which found that age significantly influences students' health information needs, with older students demonstrating lower needs than their younger counterparts.

Second, the class level of the student was negatively influenced by the information needs. The implication is that students in lower classes have higher information needs than those in higher classes. As students progress through higher levels, they are more likely to have been exposed to health education topics multiple times through formal curriculum, peer discussions, or media, leading them to feel that they already know the information. Moreover, students at higher levels may have better research skills, enabling them to access and utilize information from various sources, thus reducing their perceived health information needs. This is similar to the study by Maphoto (2016), which revealed that there was a lower extent of information needs as students progressed to higher classes.

Third, the student's residence influenced the information needs. The respondents residing outside the locality have higher information needs than those residing within the locality. Holst *et al*. (2023) elaborated that students residing in urban areas or those located far from central or well-connected regions exhibit differences in their access to health information. This variation is often attributed to disparities in infrastructure, availability of media, and exposure to school or community-based health programs. Students in remote or underserved areas may have fewer opportunities

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to receive accurate and timely health information, which can limit their awareness and ability to make informed health decisions. In support of this, Hailemariam *et al.* (2021) emphasized the importance of developing targeted health communication strategies that address geographic discrepancies. They recommended that interventions should be tailored to meet the specific needs of students based on their location, whether urban, peri-urban, or rural. By doing so, educational and health institutions can help bridge the information gap, ensuring that all students, regardless of where they live, have equitable access to relevant and age-appropriate health information. This approach is essential for promoting inclusive health education and reducing inequalities in health knowledge and outcomes among adolescents.

Fourth, the sex variable had a positive beta coefficient. However, this relationship was not statistically significant. Similarly, the education level of the parents had a negative beta coefficient. Nevertheless, this variable was also not statistically significant. This lack of significance could be due to the fact that most students in the study reported that their parents had formal education ranging from secondary school to a bachelor's degree. As a result, there may have been limited variation in parental education levels, making it difficult to detect a meaningful difference in how parental education influences students' access to or need for health.

4.2.4 Health Information Accessibility among Secondary Schools' Students

The results showed that the most highly accessible health information was related to types of food for a balanced diet. This implies that the most accessible health information in the study area was nutrition-related. One possible reason for this is the availability of nutrition topics in the science subject, which students are taught in school. This enables them to access information regarding the types of food to consume to maintain a balanced diet. These findings are consistent with a study by Kundu *et al*. (2024), which reported high access to nutrition information among secondary students. Similarly, a study by Harrison *et al*. (2023) revealed that adolescents aged 11 to 19 reported high access to nutrition information from multiple sources, including television, radio, and parents.

In addition, the second most accessed category of health information among students was related to physical exercise for the prevention of obesity. This relatively high level of access may be attributed to the structured inclusion of sports and physical education in the school timetable. Many schools actively promote student participation in games and athletic competitions, creating an environment where physical activity is not only encouraged but also integrated into daily routines. These activities likely increase students' exposure to and understanding of the importance of regular physical exercise in maintaining a healthy body weight and preventing obesity. This provides an opportunity for students to practice and understand so they can be selected to represent their class." This points out that there is empowerment of knowledge to students through physical exercise, which increases their access to information.

Furthermore, the biology curriculum in secondary schools often addresses critical health-related topics, including the consequences of poor nutrition and lifestyle choices. Within this context, students are taught about the health risks associated with being overweight or obese, as well as effective strategies for weight management. These lessons reinforce the significance of regular physical activity as a preventive health measure and provide students with both the knowledge and motivation to engage in healthy behaviors. Supporting these findings, Kalabamu *et al.* (2020) conducted a study among secondary school students in Kinondoni Municipal, Dar es Salaam, and found that a majority of participants reported regularly participating in physical sports activities. This suggests that students not only have access to information about physical exercise but also opportunities to put that knowledge into practice through school-based programs. The combination of academic instruction, structured physical activities, and competitive sports likely contributes to students' overall awareness and engagement in physical exercise as a tool for obesity prevention.

Moreover, the third category of health needed information was those related to access to health information topics, related to stress management techniques, and substance abuse prevention and support. A possible explanation for the relatively moderate access to these topics could be the lack of trained experts and structured programs that raise awareness about managing stress and preventing substance abuse. During adolescence, students are often curious and eager to experiment with various aspects of life, including substances. However, since substance use is generally not socially accepted, some engage in it secretly. Additionally, many students may lack proper psychological support and accurate knowledge on how to cope with stress, which can increase their vulnerability to substance use. Therefore, there is a need for each school to have trained professionals who can provide guidance on stress management and deliver effective programs related to substance abuse prevention and support.

The least accessed health information topics were the prevention of sexually transmitted diseases (STDs) and puberty changes. Possible reasons for this low access may include the absence of comprehensive or well-structured sex education programs in some schools. These programs often lack coverage of essential topics such as STDs due to a shortage of well-trained and knowledgeable health educators. Additionally, while the biology syllabus includes content on puberty changes, it was revealed that only three students mentioned learning about this topic in class. Further classroom observations indicated that some students were reluctant to ask questions during lessons, possibly due to embarrassment or discomfort discussing sensitive subjects. Msovela *et al.* (2025) conducted a study focusing

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on adolescents' knowledge of puberty and menstruation and found that students had a limited understanding of these topics. These findings suggest a clear need for tailored educational programs aimed at enhancing students' access to accurate information about sexually transmitted diseases and puberty-related changes prevention of early pregnancy.

4.2.5 Socio-Demographic Characteristics Influencing Health Information Accessibility of Secondary Schools' Students

First, age significantly influenced positively the accessibility of health information needs. This implies that older students have greater access to health information. A possible explanation for this finding is that older students tend to be more mature and are more likely to be aware of and utilize various sources of information, thereby increasing their chances of accessing health-related content. This finding is consistent with the study by Fastrich *et al*. (2024), which found that an increase in student age is associated with a higher ability to search for and retrieve information.

Second, the class level of the students significantly influenced their access to information. The results' implication is that the students in higher classes had greater access to health information. A possible explanation for this finding is that as students advance in their education, their knowledge and skills improve, enabling them to search for information more effectively, become more aware, and gain confidence in seeking information, including topics related to health. Similarly, a study by Jatu *et al*. (2024) revealed that students in higher grades demonstrated better information access and evaluation skills compared to those in lower grades. In addition, Lugard (2023) found that students in higher grades exhibited greater ICT awareness and usage than their counterparts in lower grades. This trend was attributed to increased exposure to ICT resources and more opportunities to integrate technology into their learning processes. Greater access to ICT resources may, in turn, enhance access to various types of information, including health-related information.

Similarly, sex has a negative beta coefficient means that female student had higher levels of access to health information compared to their male counterparts. One possible explanation is that female students are active in discussing or seeking information about health, particularly topics related to sexual and reproductive health. Despite this trend, the variable was not statistically significant, suggesting that the difference in access between male and female students may be due to chance or influenced by other unmeasured factors. This is contrary to the study by Chekol et al (2023) revealed that boys scored higher in most domains of information search than girls.

In addition, the education level of the head of household showed a positive beta coefficient of 1, indicating a slight positive relationship between parental education and students' access to health information. This finding suggests that more educated parents are likely to value health education and provide better health-related guidance and resources to their children. Nonetheless, this relationship was also not statistically significant, meaning that the level of education of household heads was not a significant factor in determining access to health information for students in this study. This is contrary to a study by Pufall *et al*. (2026), which found that parents' education was linked to increased awareness and discussion of health issues in the household.

The results of the regression analysis revealed that the student's place of residence had a negative beta coefficient. This implies that students residing outside the study area or school locality had lower access to health information than those residing within the area. This could potentially be explained by differences in access to school-based programs, community health initiatives, or local media campaigns that are more readily available within the immediate school environment. However, this relationship was not statistically significant, indicating that place of residence may not be a strong predictor of access to health information among secondary school students.

Generally, the findings suggest that while there are observable trends relating to residence, sex, and household education level, none of these variables had a statistically significant influence on students' access to health information. This implies that other factors not included in the model may play a more important role in determining access.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Access to health information is crucial for enabling secondary school students to reduce their risk of health-related problems, as improving personal health outcomes depends on both access to and proper use of such information. This study concludes that students have a strong need for health information on key topics, including the prevention of sexually transmitted diseases (STDs), dental care and oral hygiene, puberty and bodily changes, and early pregnancy prevention.

Younger students have greater health information needs compared to older ones. Similarly, students in lower classes have higher information needs than those in higher classes. Students residing outside the locality have greater

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information needs than those living within it. While older students and those in higher classes have greater access to health information, their perceived need for it tends to be lower.

5.2 Recommendations

The study recommends the following actions to enhance students' access to health information: Establishing school health clubs in each participating school within the next academic year, guided by trained health professionals, to facilitate peer-led health education programs addressing highly needed information on topics such as STIs and puberty. Distribute printed health education materials focusing on sexual and reproductive health, puberty, and nutrition quarterly, with assessments of utilization and impact after one year. Tailor health communication strategies by considering students socio-demographic characteristics especially residence and age to optimize outreach efforts.

REFERENCES

Abdissa, G. (2021). Knowledge on menstruation and practice of menstrual hygiene management among school adolescent girls in Central Ethiopia: A cross-sectional study. *Risk Management and Healthcare Policy, 14*, 911–923. https://doi.org/10.2147/RMHP.S296670

Adeniyi, O. E., David, O. B., Kolawole, M. O., Agboola, I. O., Olanike, A. A., & Abayomi, O. K. (2022). Socio-demographic characteristics and utilization of electronic information resources among Nigerian university students. *Library Herald Journal, 60*(4), 1.

Anne-Laure, H. S., Maxime, M., Denise, B. M., Nathalie, B., & Cindy, S. (2024). Determining adolescent health information needs: A survey in Geneva, 2022. *Preventive Medicine Reports, 41*, 102682. https://doi.org/10.1016/j.pmedr.2024.102682

Ayubu, A. E., & Kabeya, L. D. (2019). Knowledge, attitudes, and use of family planning methods among female secondary school students in Tanzania. *Research Square*, 2019, 1–13. https://doi.org/10.21203/rs.2.13447/v1

Bayingana, J. M., Shyaka, G., & Ogendi, J. (2024). Knowledge, attitude and practices towards oral health among secondary school students in Huye district, Rwanda. *African Health Sciences, 24*(1), 183–194. https://doi.org/10.4314/ahs.v24i1.22

Basnyat, I., Nekmat, E., Jiang, S., & Lin, J. (2018). Applying the modified comprehensive model of information seeking to online health information seeking in the context of India. *Journal of Health Communication, 23*(6), 563–572.

Boateng, S., Asare, D., Manu, P. T., Sefah, E. A., & Adomako, J. (2021). Relationship between students' home background and their academic performance: A case of some selected senior high school students in rural districts in Ashanti Region, Ghana. *Journal of Education, 201*(3), 153–161.

CDC. (2023). Protects people in the United States and around the world by preventing, detecting, and responding to disease threats anytime and anywhere (22 pp.). Centers for Disease Control and Prevention.

Chekol, B. M., Sheehy, G., & Siraneh, Y. (2023). Sexual and reproductive health experiences, access to services, and sources of information among university students in Ethiopia. *Frontiers in Reproductive Health, 5*, 1271685. https://doi.org/10.3389/frph.2023.1271685

Duplaga, M., & Grysztar, M. (2021). Socio-economic determinants of health literacy in high school students: A cross-sectional study. *International Journal of Environmental Research and Public Health, 18*(22), 12231.

Essén, B., Åkerman, E., Larsson, E. C., & Westerling, R. (2019). A missed opportunity? Lack of knowledge about sexual and reproductive health services among immigrant women in Sweden. *Sexual & Reproductive Healthcare, 19*, 64–70.

Fastrich, G. M., FitzGibbon, L., Lau, J. K., Aslan, S., Sakaki, M., & Murayama, K. (2024). Adult age differences in noninstrumental information-seeking strategies. *Psychology and Aging, 39*(3), 313.

Ferraris, G., Monzani, D., Coppini, V., Conti, L., Maria Pizzoli, S. F., Grasso, R., & Pravettoni, G. (2023). Barriers to and facilitators of online health information-seeking behaviours among cancer patients: A systematic review. *Digital Health, 9*, 20552076231210663. https://doi.org/10.1177/20552076231210663

Fetherston, M. (2019). What influences college students' career information seeking on the internet? A test of the comprehensive model of information seeking. *Journal of Applied Communication Research, 47*(2), 1–22.

Folorunso, O., & Olaniyi, F. (2020). Socio-demographic factors and online information-seeking behaviour of postgraduate students, Faculty of Education, University of Ibadan, Nigeria. *Nigerian Library and Information Science Review, 20*, 28–42.

Gift, A., & Mweya, C. N. (2024). Prevalence and factors influencing substance abuse among secondary school students in Mbeya City, Tanzania. *African Health Sciences, 24*(3), 430–437.

Licensed Under Creative Commons Attribution (CC BY-NC)

Gondim, P. S., Souto, N. F., Moreira, C. B., da Cruz, M. E. C., Caetano, F. H. P., & Montesuma, F. G. (2015). Accessibility of adolescents to sources of information on sexual and reproductive health. *Journal of Human Growth and Development, 25*(1), 50–53.

Hailemariam, S., Gutema, L., Agegnehu, W., & Derese, M. (2021). Challenges faced by female out-of-school adolescents in accessing and utilizing sexual and reproductive health service: A qualitative exploratory study in Southwest, Ethiopia. *Journal of Primary Care & Community Health, 12*, 21501327211018936.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.

Hamilton-Ekeke, J. T., Abam, R. P., & Ogobiri, E. (2020). Health literacy in the promotion of wellness among secondary school students in Bayelsa State, Nigeria. *Journal of Health Education Teaching, 11*(1), 1–7. www.jhetonline.com

Harrison, A., Tyrill, C., Cousins, S., Rocke, K., & Gossell-Williams, M. (2023). Disparity between adolescents' health information needs and the information received in a middle-income country. *Journal of Tropical Pediatrics, 69*(2), fmad018.

Holst, C., Tschirhart, N., Ngowi, B., Noll, J., & Winkler, A. S. (2023). Utilizing community InfoSpots for health education: Perspectives and experiences in Migoli. *Health Promotion International, 38*(4), 1–11.

Holtman, N., Bimerew, M., & Mthimunye, K. (2024). Adolescent girls' sexual and reproductive health information needs and barriers in Cape Town. *Health SA Gesondheid, 29*, 2650.

Human Rights Watch. (2017). I had a dream to finish school: Barriers to secondary education in Tanzania. Human Rights Watch.

Ito, K., Madeni, F. E., & Shimpuku, Y. (2022). Secondary school students' and peer educators' perceptions of adolescent education in rural Tanzania: A qualitative study. *Reproductive Health, 19*, 109. https://doi.org/10.1186/s12978-022-01418-6

Jiang, F., Liu, Y., Hu, J., & Chen, X. (2022). Understanding health empowerment from the perspective of information processing: Questionnaire study. *Journal of Medical Internet Research, 24*(1), e27178.

Kalabamu, F. S., Msengi, G., & Mkopi, N. (2020). Magnitude of overweight, obesity and insufficient physical sports activities among secondary school students in Kinondoni Municipal, Dar es Salaam. *East African Health Research Journal, 4*(2), 164–171.

Kassim, M., & Katunzi-Mollel, K. (2020). Antecedent factors influencing maternal health information seeking behaviour of women of childbearing age in rural Tanzania. *University of Dar es Salaam Library Journal, 15*(2), 57–68.

Kavana, N. (2021). Sexually transmitted infections among secondary school students in Mlimba Division, Ifakara, Tanzania. *International Journal of Sexually Transmitted Diseases, 1*(1), 20–27.

Kavitha, N., & Chandrashekara, M. (2022). Information needs and information seeking behaviour of secondary school students in Mysore North Block: A study. *Asian Journal of Information Science & Technology, 12*(1), 2.

Kundu, S., Khan, M. S. I., Bakchi, J., Sayeed, A., Banna, M. H. A., Begum, M. R., & Hassan, M. N. (2020). Sources of nutrition information and nutritional knowledge among school-going adolescents in Bangladesh. *Public Health in Practice, 1*, 100030. https://doi.org/10.1016/j.puhip.2020.100030

Kutner, B. A., Perry, N. S., Stout, C., Norcini Pala, A., Paredes, C. D., & Nelson, K. M. (2022). The inventory of anal sex knowledge (iASK): A new measure of sexual health knowledge among adolescent sexual minority males. *The Journal of Sexual Medicine, 19*(3), 521–528.

Lee, K., Fanguy, M., Lu, X. S., & Bligh, B. (2021). Student learning during COVID-19: It was not as bad as we feared. *Distance Education, 42*(1), 164–172.

León-Himmelstine, C., Samman, E., Kyungu, E., Roche, J. M., Festo, C., Plank, G., Amani, E., Samuels, F., & Pellini, A. (2021). Mental health and psychosocial well-being among adolescents in Tanzania: Findings from a mixed-methods baseline study. Overseas Development Institute.

Lugard, I. A. (2023). Assessment of information and communication technologies awareness level among secondary school students in Delta State, Nigeria. *Asian Journal of Education and Social Studies, 39*(3), 15–33. https://doi.org/10.9734/ajess/2023/v39i3846

Maphoto, A. R. (2016). *Information needs and information seeking behaviour of Grade 10 and 11 learners at Gerson Ntjie Secondary School, at Magooa Village, Limpopo Province* (Doctoral dissertation, University of KwaZulu-Natal, Pietermaritzburg).

Martinović, I., Kim, S. U., & Stanarević Katavić, S. (2023). Study of health information needs among adolescents in Croatia shows distinct gender differences in information seeking behaviour. *Health Information & Libraries Journal, 40*(1), 70–91. https://doi.org/10.1111/hir.12369

Mavura, R. A., Nyaki, A. Y., Leyaro, B. J., Mamseri, R., George, J., Ngocho, J. S., & Mboya, I. B. (2022). Prevalence of substance use and associated factors among secondary school adolescents in Kilimanjaro region, northern Tanzania. *PLoS ONE, 17*(9), e0274102. https://doi.org/10.1371/journal.pone.0274102

Licensed Under Creative Commons Attribution (CC BY-NC)

Mbatia, C. (2024). Role of peer influence on substance abuse among teenagers in Kenya. *European Journal of Sociology, 7*(2), 1–10.

Mishra, S. K., & Mukhopadhyay, S. (2021). Knowledge and practices about sexual health and its socioeconomic correlates among adolescent girls in Sikkim, India. *The Oriental Anthropologist, 21*(1), 49–66.

MoEST & Ministry of Health. (2021). *National strategy for inclusive education 2021/22–2025/2026*. Dodoma, Tanzania.

Msollo, S. S., & Majaliwa, N. K. (2025). Knowledge and practices on prevention of overweight and obesity among secondary school adolescents in Morogoro Municipality, Tanzania. *Advances in Public Health, 2025*(1), 9970378.

Msovela, J., Shija, A. E., Ntuyeko, H., Imeda, C., Mugula, A., Mgina, E., & Egidio, A. A. (2025). Puberty and menstruation knowledge, information sources and needs among secondary school adolescent girls and boys in Kibaha, Tanzania. *PLOS Global Public Health, 5*(3), e0004176.

Nash, K., O'Malley, G., Geoffroy, E., Schell, E., Bvumbwe, A., & Denno, D. M. (2019). "Our girls need to see a path to the future": Perspectives on sexual and reproductive health information among adolescent girls, guardians, and initiation counselors in Mulanje district, Malawi. *Reproductive Health, 16*, 1–13.

National Institute on Drug Abuse. (2022). Race and drug use: An analysis of trends and impacts. https://www.nida.nih.gov/reports/race-and-drug-use

Ndijuye, L. G., & Dadi, N. (2024). Home learning environments and family socioeconomic status: Implications on early learning attainments in Tanzania. *Journal of Early Childhood Research, 22*(2), 207–223.

Ngissa, S., Sanga, E., Nsanya, M. K., Kweka, B., & Malindisa, E. (2024). Curriculum-based sexual and reproductive health education: Revealing its relevance for risky sexual behaviors among secondary school students in Mwanza, Tanzania. *Reproductive Health, 21*(58), 1–10. https://doi.org/10.1186/s12978-024-01798-x

OECD. (2021). *Health at a glance 2021: OECD indicators*. OECD Publishing. https://doi.org/10.1787/ae3016b9-en

Otoide, P. G. (2015). Information needs of secondary school students in selected schools in Abaraka Community. *International Journal of Academic Library and Information Science, 3*(3), 81–88.

Oyedokun-Adebagbo, F., de Silva, S., Jadhav, A., Fabic, M. S., Munthali, L., & Kebede, Z. (2024). Family planning, reproductive health, and progress toward the Sustainable Development Goals: Reflections and directions on the 30th anniversary of the International Conference on Population and Development. *Global Health: Science and Practice, 12*(5), 6.

Pallant, A., Lee, H. S., & Pryputniewicz, S. (2020). How to support secondary school students' consideration of uncertainty in scientific argument writing: A case study of a High-Adventure Science curriculum module. *Journal of Geoscience Education, 68*(1), 8–19.

Pendl, D., Maitz, K. M., & Gasteiger-Klicpera, B. (2024). Examining the relationship between health literacy and individual and sociodemographic factors in secondary school students. *Journal of Public Health, 32*(3), 531–542.

Pufall, E., Eaton, J. W., Nyamukapa, C., Schur, N., Takaruza, A., & Gregson, S. (2016). The relationship between parental education and children's schooling in a time of economic turmoil: The case of East Zimbabwe, 2001 to 2011. *International Journal of Educational Development, 51*, 125–134.

Rahayu, A., Setyawan, H., Sabariah, S., Rufii, R., Hendri, N., Safrudin, S., & Sanjaykumar, S. (2024). Strategies to increase physical activity in elementary school children in the digital age to support a healthy lifestyle. *Retos: Nuevas tendencias en educación física, deporte y recreación, 61*, 1410–1421.

Rashidi, R. (2015). Socio-economic factors affecting students' accessibility to rural community secondary schools in Tanzania: A case of Tunduru District (Master's thesis, University of Dar es Salaam).

Sambah, F., Quansah, F., Srem-Sai, M., Frimpong, J. B., Agormedah, E. K., Ankomah, F., & Hagan, J. E. Jr. (2023). Assessing secondary school students' digital health literacy, information searching behaviours, and satisfaction with online COVID-19 information in Northern Ghana. *Heliyon, 9*(7), e17936. https://doi.org/10.1016/j.heliyon.2023.e17936

Shrestha, N., Aryal, S., Nepal, S., Marahatta, A., Gurung, B., & Sharma, B. (2024). Knowledge, barriers and perceived needs of adolescent sexual and reproductive health services among higher secondary school students in Chitwan district. *Journal of Gandaki Medical College-Nepal, 17*(2), 129–135.

Spinelli, H., & Martinovich, V. (2024). From the factory model to the classroom-workshop: Learning from practice in the fields of health and education. *Global Public Health, 19*(1), 2290677.

The Chanzo. (2023). Infographic: 329,918 students dropped out of schools in Tanzania in 2022. https://thechanzo.com/infographic-329918-students-dropped-out-of-schools-in-tanzania-in-2022

Tönsing, K. M., Dada, S., Bastable, K., & Samuels, A. (2022). Health information and education needs for youth with complex communication needs during the Covid-19 pandemic: Rehabilitation professionals' perspectives. *Disability and Rehabilitation, 45*(10), 1619–1628. https://doi.org/10.1080/09638288.2022.2069872

Licensed Under Creative Commons Attribution (CC BY-NC)

UNESCO. (2021). *Making every school a health-promoting school: Global standards and indicators* (67 pp.).

Upadhyay, J. (2023). Criteria for proper selection of study area, population, and sample. School of Health and Allied Sciences, India. https://www.slideshare.net/slideshow/criteria-for-proper-selection-of-study-area-population-and-samplepptx/256771483

Waral, L. N. (2020). A study on the information collecting mode of secondary school students in a digital setting. *Library Philosophy and Practice, 2020*, 1–16.

Wilder, R. (2023). Power, authority and expertise: Policy making about relationships and sex education in English primary schools. *Journal of Education Policy*, *38*(5), 782–802.

World Bank. (2022). *Achieving gender equality in education: Examining progress and constraints* (36 pp.).

WHO. (2022). Global case for support—UNICEF and WHO joint programme on mental health and psychosocial well-being and development of children and adolescents. World Health Organization.

WHO. (2023). The critical role of accessibility in health information. World Health Organization. https://www.who.int/news/item

Xu, S., Shi, Y., Yang, T., Liu, Z., Liu, T., Li, X., & Liu, N. (2025). Mkrag: Medical knowledge retrieval augmented generation for medical question answering. In *AMIA Annual Symposium Proceedings* (Vol. 2024, p. 1011). San Francisco.

Yang, Q., Van Stee, S. K., & Rains, S. A. (2023). Comprehensive model of information seeking: A meta-analysis. *Journal of Health Communication, 28*(6), 360–374.

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Effect of parenting self-efficacy on teenagers' self-regulation after COVID 19 in Kakamega North Sub-County, Kenya

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ABSTRACT

It is established that parenting a teenager in the digital era is a daunting task. This study aimed to determine how parenting self-efficacy affects the self-regulation of teenagers in Kakamega North Sub-County after COVID-19. The study employed an ex post facto research design in conjunction with a correlation design. It was guided by two theories: self-efficacy theory by Bandura and attachment theory by John Bowlby. The target population of the study from the 44 secondary schools was 4667 respondents. The sample size from 10 secondary schools comprised 200 parents, 200 students, and 10 teachers of guiding and counseling. The sample was selected using stratified random and purposive sampling. Data was collected using questionnaires and interviews. Parenting self-efficacy was measured by the Parenting Sense of Competence Scale (PSOC)—a measure that contains 17 items, which are rated on a six-point Likert scale to demonstrate parental satisfaction and efficacy. Teenager self-regulation was measured by the teenager's Self-Regulation Questionnaire (SRQ). Building strong research and choosing appropriate design instruments coupled with piloting ensured validity and reliability. Cronbach's alpha reliability coefficient index for data collection instruments was ≥.60, which was acceptable at a .60 threshold. Ethical considerations were observed. Data analysis comprised use of descriptive statistics (percentages, means, and standard deviations) and inferential statistics (Pearson's (r), t-test, and linear regression). Qualitative data was analyzed thematically. A Pearson correlation coefficient of 0.441, at the 0.01 level (2-tailed), indicated a positive relationship between the two variables. This suggests that higher PSE is linked to improved self-regulation among teenagers. The results unravel the importance of fostering parenting self-efficacy to enhance teenagers' behavioral outcomes. The study recommends parents adopting practices that boost their teenagers' self-regulation, which in turn shapes behavior outcomes, and parenting training programs to teach parents strategies to improve teenage self-regulation.

Keywords: COVID 19, Kakamega North Sub-County, Parenting, Parenting Self-Efficacy, Teenager Self-Regulation

I. INTRODUCTION

Globally many parents across family structures and dynamics (single parent households, blended families and extended family networks) were found to have suffered stressful balance of work, care for children and maintenance of the family, particularly, they were separated from the regular support network in the wake of COVID 19 (World Health Organization [WHO], 2020). The parents also suffered a well-being shock because of economic strain (Brodeur *et al.*, 2021). In Eastern Europe, as in other parts of the world, the COVID 19 pandemic significantly impacted parents' roles as lockdowns, remote work and school closures forced families into new and often challenging circumstances. Parents faced increased stress and role strain due to the demands of homeschooling, remote working and caregiving (Wang et al., 2020). These stresses could have reduced PSE as parents may have felt overwhelmed by the complexities of managing multiple responsibilities at once (O'Connor et al., 2020)

Africa, culturally diverse with a wide range of parenting practices influenced by traditions, beliefs and customs had teenagers exposed to social vices such as amplified teenage pregnancies, child labour, increased early marriages or increased transactional sex, drug and substance abuse, gender based violence and poor mental health- all stemming from inability to self-regulate (Gettleman, 2020). Socio economic factors such as poverty, limited access to education and inadequate healthcare pose challenges to parental self.o-efficacy and teenager self-regulation. In West Africa there was increased economic instability and job losses where many people rely on informal sectors and daily wages. This added financial pressure which likely decreased parent's sense of self efficacy (Chinawa et al., 2021). The pandemic exacerbated mental health issues among parents including anxiety, depression and stress. These psychological burdens

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can severely impact parenting self-efficacy, as stressed parents are less likely to feel confident in parenting abilities (Afifu et al., 2021).

In Uganda Ssempebwa and Carpenter (2010) indicates that the pandemic led to major changes in the social and economic lives of teenagers and their parents. They were forced to stay home, which disconnected them from their work/ livelihoods, social support systems and services like medical care and education. In turn, this led to food insecurity; domestic violence, stress and family separation; child labor, delinquency and disorientation from education; crime and human rights abuses; drug abuse, mental health problems and social ills like prostitution; environmental degradation; and loss of confidence in government's ability to offer services.

Teenagers in Tanzania were not at peace either as COVID 19 impacted their mental health (Brozou, 2021). The psychological impact of quarantine for teenagers brought isolation, social exclusion, stigma and fear. There was diagnosis of acute stress disorder, adjustment disorder, grief and post-traumatic stress disorder (Imran et al., 2020). They experienced loneliness, stress and fear due to the uncertainties around their future, education, the local economy, and the threat of the coronavirus disease. Restlessness, irritability, anxiety and clinginess with increased screen time was reported. Gendered impacts emerged, with girls more vulnerable to early marriage and unintended pregnancy while boys struggled with lack of opportunity in the labour market and feelings of hopelessness in their local context (Chinawa et al., 2021).

Kenya hit the third globally in teen pregnancy and HIV infection that is traced back to COVID 19. According to International Center for Research on Women (ICRW, 2021), girls found themselves in a precarious state with their caregivers losing their jobs, reducing working hours and increasing unsupervised hours, thereby increasing the risk of abuse. Therefore, adolescents became pregnant, got married, entered the unpaid labour market, and became orphans or transfered congenitally (ICRW, 2021). According to 'Keeping the Promise' (Impact of COVID -19 on Adolescents in Kenya) data collected in February 2021 highlights that sexting and other risky uses of social media, substance abuse, illegal activities and fighting among teenagers remained a problem.

Kakamega County recorded 16,957 teenage pregnancies in 2019, 14374 in 2020 and 6,616 between January and June 2021. Lugari Sub County had the highest number at 795 followed by Kakamega North (the area of study) at 565 with numerous HIV infection cases. In Kakamega North Sub-County, increased cases of teenage boys engaging in truancy (19.6%) was also reported (Inyanji, 2021). Reports of child labour, where teenage boys engaged in small scale business (boda boda) were also recorded.

1.1 Statement of the Problem

Parenting plays a crucial role in developing self-regulation in teenagers especially towards management of emotions, behaviour and thoughts in a way that supports goal directed actions. Ineffective parenting can hinder a teenager's ability to develop self-regulation, leading to difficulties in emotional control, behaviour management and decision making. Teenagers stayed home for over 10 months during Missing reference COVID 19 pandemic and two months during the callous floods of April and May 2024. These were the longest periods parents stayed with their school going teenagers at home. It is also known that some parents experienced inadequacies and incompetence in parenting and admitted that they had limited control over their teenager children (Wekullo, et al., 2022). This led to some parents saying that they would rather have the teenagers in the hands of teachers as opposed to being home. There had been counter claims and blame games going round, where parents were accused of negligence of their parenting responsibilities, as the Ministry of Education (M.O.E.) blamed them over the student's deviant behaviour (Malava Sub County Education office).

Despite parents' efforts towards their parenting role, Kakamega North Sub County has experienced teen behaviour problems including drug and substance abuse, teen pregnancies, teen aggressive behaviour, truancy and defiance among other teen misbehaviours (Malava Sub County Education Office, 2022). These are clear indicators of inadequacy in parenting in Kakamega North Sub County. Studies have been conducted to examine the effects of COVID-19 on society (Wilson et al., 2020, Wekullo, et al., 2022). Despite the recognized importance of parental self-efficacy in teenager development, there remains a gap in understanding its specific impact on the self-regulation of teenagers in Kakamega North Sub County. Limited research exists on the extent to which parental self-efficacy influences the self-regulatory abilities and behavioural tendencies of teenagers in this region. This study sought to investigate the effects of parental self-efficacy on self-regulation of teenagers in Kakamega North Sub County, Kenya aiming to provide insights that can inform targeted interventions and support systems for both parents and teenagers.

1.2 Research objective

To determine the effect of parenting self-efficacy on self-regulation of teenagers after COVID 19 in Kakamega North Sub County.

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II. LITERATURE REVIEW

2.1 Theoretical Framework

This study was anchored on two theories; the self-efficacy construct, postulated by Bandura (1997) and Attachment theory, developed by John Bowlby (1988).

2.1.1 Self-efficacy Theory

Parental self-efficacy founded in Bandura's cognitive theory is the belief in a way a parent handles child-related responsibilities and how they affect a child's ability to adapt (Jiao et al., 2020). Studies from diverse cultural backgrounds have demonstrated that a parent who employs effective parenting strategy promotes his or her child's adaptation and maturation of self-regulation, (Kövesdi et al., 2021). PSE is a key determinant of behaviour, since higher levels of self-efficacy make parent's model and adapt to coping strategies and provide consistent support to their children.

2.1.2 Attachment Theory

Attachment theory, developed by John Bowlby (1988) focusses on emotional connections between parents and teenagers. It posits that the quality of connection between parents (caregivers) and teenagers can influence the latter's self-regulation and behaviour outcomes. The theory posits that early attachment experiences with caregivers form the blueprint for later relationships, influencing expectations and behaviour in mature romantic relationships. Secure attachment, according to Bowlby, is exhibited by the teenager's confidence in the caregiver's availability and responsiveness. Parents with stronger self-efficacy may create more secure connectedness, leading to better self-regulation and behaviour in teenagers. Teenagers with proper attachments are likely to develop into emotionally healthy adults, capable of creating stable and satisfying social intimate relationships. On the other hand, weak attachment, characterized by a teenager's tendency to avoid or reject the caregiver can result to difficulties in forming close relationships later in life.

2.2 Empirical Review

Empirical studies demonstrate that PSE predicts teenager self-regulation. Lee et al., (2021) compared the cultural influences on parental self-efficacy and teenager self-regulation. Results revealed cultural differences in parental self-efficacy beliefs and parenting practices which in turn influenced teenage self-regulation outcomes. Kövesdi et al. (2021) investigated the role of self-efficacy in adaptation regarding parental and child resilience; a longitudinal study on the two waves of COVID 19. The study addressed the effects on family balance during COVID 19, such as perceived stress, health anxiety, and addressed psychological factors that support flexible adaptation during the pandemic. 648 parents and their children completed the questionnaire package. Random sampling was performed by the snowball method on an online interface. The results in the first wave, activity and movement showed a positive association with self-regulation being an option for self-efficient behavior. Analysis of the first and second samples of the longitudinal study showed similar results where self-efficacy is a protective factor against the stress that occurs in a pandemic (Kövesdi, 2021). Teenagers whose parents reported high levels of stress showed more externalization problems and developed poorer emotion regulation (Deater-Deckard, 2017).

In West Africa (Togo, Benin and Nigeria), Chinawa et al., (2021) investigated the relationship between resilience, social participation, self-regulation, optimism and coping styles among youths in these countries. The study found out that self-regulation serves as a mediating factor in enhancing resilience and coping mechanisms. While this study does not focus exclusively on post COVID 19 era, it offers fundamental knowledge on the interplay between parenting self-efficacy and teenager self-regulation in African contexts.

Achieng *et al*., (2018) investigated affluent parents' behaviour and adolescents' levels of assertiveness in Karen Zone Nairobi County. Eric Erickson's theory of psychological development was used and a convergent parallel design. The target population was 23263 with a sample size of 578 respondents consisting of 96 parents and 80 house helps purposely sampled; 384 adolescents and 18 local officers randomly sampled. The study used questionnaires for collecting data from both parents and adolescents. Findings revealed that adolescents' level of assertiveness was influenced by parental support, parental separation, divorce, absence and poor parent-adolescent relationships. The study recommended the need for strengthening policies on guidance and counselling services for parents and adolescents for enhancement of assertiveness. Achieng et al., (2018) emphasizes influence of affluent parents on the level of assertiveness of adolescents. The current study sought to investigate parent's self-approval in parenting and its influence on behaviour outcome in teenagers. Again, the study was conducted in Karen Zone of Nairobi County among affluent parents and their teenager children whereas the current study considered home and school environment in the rural area of Kakamega North Sub County. The difference in geographical area and location, economic differences, level of study and the difference in variables in the two studies may yield different results.

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Kakamega County studies dwell on self-regulated learning's role in academic achievement among form three students indicating self-regulation predicted good performance amid stressors (Wanjala, 2023). However, teenagers with emotional disorders in Kakamega face transition barriers including limited resources to support self-regulation (Onyango & Natarajan, 2022).

As global and Kenyan literature shows PSE as an indicator of self-regulation, there is scarce information on post COVID effects in rural Kenyan settings like Kakamega North sub county (Kenya National Bureau of Statistics [KNBS], 2022). Available information is from the Coast and Nairobi (urban) indicating disparities in pandemic effects, with rural teenagers facing seclusion and school dropout risks (Khasakhala et al., 2023). Theres no study that directly links PSE to teenager self-regulation in this area of study, despite its relevance for attention targeting family resilience. This study fills this gap by exploring how post COVID PSE affects teenage self-regulation and informing tailored programs to alleviate pandemic effects.

III. METHODOLOGY

The study adopted ex post facto research design. This research design is useful when investigating cause-effect relationships between independent and dependent variables in situations which do not permit manipulation of variables. The research designs enabled the study to gather adequate information that provides a better understanding of a research problem and responding to the research hypothesis. The study was conducted in Kakamega North Sub-County in Kakamega County. The sub-county is the largest in Kakamega County an area of approximately 423.3 square kilometers with a population of about 205,166. There are 44 fully registered secondary schools in the area. All the schools (44) in the sub county are fully registered by the Ministry of Education. The target Population (N) of form four students is 4667 and 4500 for parents respectively. Boys -2374, girls-2293. The number of boys' boarding schools -6, girls boarding secondary schools are 9. The number of mixed schools secondary -34. The total number of students in mixed schools 3113: male 1574, female 1539. Boys boarding students 799, girls boarding students 800.

The study used Yamane formula to arrive at the desired sample size. Parents were sampled through purposive sampling. 10 schools were sampled using stratified random sampling. Stratification was based on category of school and gender. From each school 20 form 4 students were sampled using stratified random sampling for mixed schools and simple random for pure boys and girls schools. Stratified random sampling was preferred because it enabled the researcher to reach the required representation from the segments in the population and ensured that the existing sub groups were reproduced in the sample. Each student sampled was mapped on their parent attaining an equal number of parents (200). The students and parents sampled filled a student questionnaire and a parent's questionnaire respectively. One guiding and counselling teacher was purposively sampled from each school. 10 Guiding and Counselling teachers were selected using purposive sampling technique. This technique allowed gathering of qualitative responses which lead to better insights and more precise results.

Table 1

Sample and Sampling Matrix for the Study

Description	Population	Sample size	Sampling technique
Form 4 parents	4500	200	Stratified
Form 4 students	4667	200	Stratified
G&C teachers	44	10	Purposive
Total	**9211**	**410**	

Data was collected using questionnaires and interviews. Quality measures and procedures of piloting, validity and reliability of the research instruments were under taken prior to actual data collection. The Cronbach's alpha reliability coefficient index for data collection instruments was ≥.60 which was acceptable at a .60 threshold. To ensure validity of research instruments in the present study, face, construct and content validities of the questionnaires and interview were assessed. . Quantitative data was analyzed by use of Pearson correlation with the aid of statistical Package for Social Sciences (SPSS) version 22.0. The analyzed data was presented in frequency tables, charts and graphs. Qualitative data was subjected to descriptive analysis

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The researcher visited all the sampled schools and administered copies of questionnaire to the respondents and ensured that all the copies of questionnaire were properly filled and collected. A total of 400 questionnaires were

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distributed out of which 398 were retuned. This represented a response rate of 99 percent with non-response rate at 1 percent. A response rate of 70% or more are appropriate for an effective data analysis and presentation. The results of the response rate and the results are represented as shown in table below

Table 2

Response Rate

Respondents	Sample Size	Participants	Return Rate %
Parents	200	198	99.0
Teenagers	200	200	100.0
Total	**400**	**398**	**199.0**

The overall demographic characteristics of the respondents was sought. The findings are presented as shown in table below

Table 3

Distribution of respondent's Demographic characteristics

Gender of Mainstream Students	**Frequency**	**Percent**
Male	94	47
Female	106	53
Total	**200**	**100**
Students Age Distribution	**Frequency**	**Percent**
16-19 years	196	98
Above 19 years	2	1
Total	**200**	**100**
G and C teachers' age Distribution	**Frequency**	**Percent**
Below 30 years	3	30.0
31 - 40 years	1	10.0
41-50 years	2	20.0
Above 50 years	4	40.0
Total	**10**	**100**
Education of Parent Respondents	**Frequency**	**Percent**
Bachelors	10	5
Masters	4	2
Diploma	56	28
Attained form 4 education	128	64.64
Total	**198**	**100**
Age of the parents	**Frequency**	**Percent**
Below 40 years	28	12.0
40-50 years	164	82.0
Above 50 years	8	4.0
Total	**198**	**100**

The findings in Table 3 indicate that out of the 200 student respondents the findings on the gender of the respondents indicate that female gender constituted the majority at 53.0% while the male gender stood at 47.0%. This finding revealed that there were more female student participants in the study. In terms of age, the study established that 98% of the respondents were between the ages of 15-19 years and 1% who were in the ages of above 19 years. These findings indicate that the study managed to gather data from the form four students.

Distribution of Parents and G&C Teachers by age results revealed that 10 percent of the parent were aged below 30 years, 33.3 percent between 31 and 40 years, 43.4 percent were 41 and 50 years while the remaining 13.3 percent were aged above 50 years. This implied that most of the G and C teachers were aged 31 and 50 years the findings indicate that majority of the parents respondents 64.64% had attained form 4 education, followed by diploma holders (28.00%), Bachelor (5.0%), and lastly Masters (2%). This implies that the study managed to collect data from the respondents with standard education. These people possessed knowledge about the research study and therefore aided the researcher to obtain insightful information on the effects of parental self-efficacy on self-regulation and behaviour outcomes of school-going teenagers in Kakamega North Sub County, Kenya. The data illustrates the age distribution of parents within a sample size of 200. The largest portion of parents, comprising 82% of the total, falls within the 40-50

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age range. This suggests that the majority of parents in the sample are in their forties or approaching that age bracket. Conversely, a smaller but still notable percentage, 14%, are below 40 years old, indicating a presence of younger parents within the group. At the upper end of the spectrum, only 4% of parents are above 50 years old, suggesting a relatively lower representation of older parents in the sample. Overall, the data provides insight into the age demographics of parents within this particular sample, revealing a predominant presence of parents in their forties based on the study. Findings of the study revealed that 33.3 percent of Teachers of Guidance and Counselling were working in the schools that participated under study. The availability of Guidance and counselling teachers was important to this study since it shows the schools were well equipped to handle any challenges the students were going through.

4.1.1 Effect of Parental Self-Efficacy on Self-Regulation of Teenagers

The study sought to establish the effects of parental self-efficacy on self-regulation and behaviour outcomes of school-going teenagers in Kakamega north Sub County. The respondents were given two sets of questionnaires. The first set was given to parents. The second set was given to teenage respondents. For the parents, a collection of questions about their parenting sense was given as indicated in the table below. They were requested by use of a tick **(✓)**, indicate whether they strongly disagree (SD), disagree (D), Undecided (U), Agree (A) or Strongly Agree (SA) with the statements regarding the effect of Parenting self-efficacy on self-regulation of teenagers. The rating of parents is shown in Table 4.

Table 4

Ratings of Parental Self-Efficacy Measured Using Parenting Sense of Competence Scale (Psoc)

Statements	Mean	Std. D
The issues of caring for a teenager are easy to correct as long as you know how your actions affect him/her, am aware of this	3.73	.861
Even though being a parent could be rewarding, I am frustrated while my teenager is at his/her present age.	2.00	.000
I go to bed the same way I wake up in the morning, feeling I have not accomplished much.	3.01	1.626
My parent was better prepared to be good parent than I am	4.00	.000
I do not know why it is, but sometimes I'm supposed to be in control, I feel more like the one being manipulated.	2.56	1.503
I would make a fine model for a new parent to emulate	5.06	.229
Being a parent is manageable, and problems are easily solved	4.00	.000
The problem in being a parent is not knowing whether you're doing a good job or a bad one	2.45	.449
Sometimes I feel like I'm not getting anything done	2.68	.470
I meet my own personal expectations for expertise in caring for my teenager.	4.00	.000
If anyone can find the answer to what is troubling my teenager, I am the one.	4.15	2.420
My talents and interests are in other areas, not being a parent	2.88	1.634
If being a parent of a teenager were only more interesting, I would be motivated to do a better job as a parent.	1.61	.489
I honestly believe I have all the skills necessary to be a good parent to be a good parent to my teenager	4.07	2.441
Considering how long I've been a parent; I feel thoroughly familiar with this role	3.49	1.130
Being a parent makes me tense and anxious	1.00	.000
Being a good parent is a reward in itself	5.15	1.883
Valid N (listwise)	3.28	

As indicated above, parents agreed that parental self-efficacy has effect on self-regulation of school-going teenagers as shown with the mean of 3.28, the results therefore imply that parents generally agreed that their competence in parenting had an effect on their teenager's self-regulation. Parents had a strong belief in their ability to handle issues related to caring for their teenagers, with a mean score of 3.73 and a standard deviation of 0.861. This suggests a confident outlook among parents that they can effectively address behavioral and developmental challenges as long as they understand the impact of their actions on their children.

Regarding emotional responses to parenting, parents reported low levels of frustration while their teenagers are at their current age, reflected in a mean score of 2.00 (SD = 0.000). This indicates that despite the inherent difficulties of parenting adolescents, such as mood swings and defiance, parents maintain a positive outlook and emotional stability during this phase.

On a personal achievement level, there was a moderate feeling among parents of not accomplishing much on a daily basis, with a mean score of 3.01 and a standard deviation of 1.626. This sentiment reflects the common struggle parents face in balancing their parental responsibilities with personal achievements and goals.

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In terms of comparison with the previous generation, parents indicated a strong belief (Mean = 4.00, SD = 0.000) that they are as well-prepared or better prepared than their own parents to be good parents. This confidence underscores their perception of personal growth and readiness in navigating the challenges of parenting.

Despite this confidence, some parents reported feeling manipulated rather than in control at times, with a mean score of 2.56 and a standard deviation of 1.503. This highlights a common parental challenge in maintaining authority and influence over their teenagers, especially during moments of conflict or negotiation.

Furthermore, parents overwhelmingly believed that they would make excellent role models for new parents to emulate, with a mean score of 5.06 and a standard deviation of 0.229. This high self-assessment suggests that they view their parenting style and practices as effective and beneficial for others.

Overall, the findings indicate a generally positive self-perception of parenting competence among the participants in Kakamega North Sub County, Kenya. Analysis on the descriptive statistics of teenager self-regulation by the students were also presented. The scale used entailed a range of 1-strongly disagree to 5-strongly agree indicating more strength towards value 5 while less strength on value of 1. The ratings of teenager self-regulation by the students is presented in Table 5.

Table 5

Teenager Self-Regulation

Statements	**Mean**	**Std. Dev.**
I usually kept track of my progress towards my goals.	4.87	.357
I have personal standards, and tried to live up to them	4.01	.141
I was willing to consider other ways of doing things	4.92	.393
If I wanted to change, I was confident that I could do it	4.95	.269
Once I had a goal I would usually plan how to reach it	4.01	.200
I was able to resist temptation	4.01	.213
I set goals for myself and kept track of my progress	4.94	.302
Valid N (listwise)	**4.53**	

The results in Table 5, respondents agreed that parental self-efficacy has effect on self-regulation and behavior outcomes of school-going teenagers in Kakamega North Sub County by a mean 4.53. The teenagers demonstrated a notably high level of self-regulation across several dimensions. They frequently kept track of their progress towards their goals, indicating a strong sense of personal accountability and motivation (Mean = 4.87, SD = 0.357). Additionally, they exhibited a willingness to consider alternative approaches to tasks or challenges, suggesting adaptability and open-mindedness (Mean = 4.92, SD = 0.393). Furthermore, the adolescents expressed a robust confidence in their ability to effect change in their lives, demonstrating a belief in their capacity for personal growth and development (Mean = 4.95, SD = 0.269). They also reported setting goals for themselves and diligently monitoring their progress, reflecting proactive goal-setting behaviors (Mean = 4.94, SD = 0.302). However, while the teenagers generally upheld personal standards and strived to meet them, this aspect scored slightly lower compared to other dimensions of self-regulation (Mean = 4.01, SD = 0.141). Similarly, their ability to plan strategies to achieve their goals and resist temptation exhibited moderate levels (Mean = 4.01, SD = 0.200 and Mean = 4.01, SD = 0.213, respectively.

The null hypothesis stated that parental self-efficacy has no statistical significance on teenager self-regulation in Kakamega North Sub County. To test the null hypothesis, a simple linear regression analysis was employed with alpha set at 0.05. The findings are presented in the table below.

Table 6

Correlations between Parental Self-efficacy and Teenager Self-regulation

		Parental self –efficacy	Teenager self-regulation
Parental Self-efficacy	Pearson correlation	1	.441
	Sig.(2-tailed)		.000
	N	200	200
Teenager Self-regulation	Pearson correlation	0.441	1
	Sig. (2-tailed)	.000	
	N	200	200

The provided correlation analysis, indicates that there is a positive correlation between parenting self-efficacy and teenager self-regulation among parents and teenagers in Kakamega North Sub County, Kenya. The Pearson correlation coefficient of 0.441, significant at 0.01 level (2-tailed), gives a positive relationship between these two

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variables and therefore rejects the null hypothesis: Parental self-efficacy has no statistically significant effect on teenager self-regulation of school-going teenagers in Kakamega North Sub-County, Kenya.

The study's vital findings of a positive correlation ($r=0.441$, $p<0.01$) between parenting self-efficacy and teenagers self-regulation align with the theoretical frameworks and empirical literature. This supports the rejection of the null hypothesis and indicates the PSE's role in enhancing adaptive behaviours in teenagers specifically in rural areas of Kenya marked by the pandemic related stressors. The positive relationship between PSE and teenagers self-regulation identifies with Bandura's emphasis on PSE as a determinant of parental attributes that fosters teenager's adaptation and maturation. Parents with pronounced approval in their parenting ability to handle teenage related responsibilities (mean PSOC score=3.28) which correlated with higher self-regulation (mean SRQ score=4.53). This indicates that efficacious parents model coping strategies in line with Jiao et al. (2020) who link PSE to regular support and adaptive teenage outcomes.

Secure attachments, facilitated by high parenting self-approval are posited to ensure teenagers self-regulation. Teenagers showed strong goal-tracking and adaptability (mean scores >4.8 on SRQ items like progress monitoring) which aligns with Bowlby's idea that secure engagements promote emotional, health and self-regulatory skills. Lee et al. (2021) shows cultural disparities in PSE and parenting activities influencing teenage self-regulation. The study's positive correlation reflects, as Kenyan cultural factors (e.g., traditions amid socioeconomic stressors) likely shaped PSE's impact. Further literature from searches (e.g., a 2017 Frontiers review on cultural contexts) indicates that shared cultural affiliations influence parental practices, affecting how teenagers develop self-regulation forms like autonomy or group-oriented behaviors. Poverty and limited education access in Kakamega North reduce PSE (as per Chinawa et al., 2021), the findings extend this by expressing PSE's resilience-building role post-COVID.

Kövesdi et al. (2021) posits PSE as a protective factor against pandemic stress, with positive associations to self-regulation. The study's results mirror this, as efficacious parents reported low frustration (mean = 2.00) and strong role-modeling (mean = 5.06), correlating with teenagers' resistance to temptations and goal-planning (means >4.0). Other studies (e.g., 2021 Frontiers on parental support for child resilience during lockdowns), yield similar results, reinforcing that PSE mitigates externalization problems and promotes emotion regulation, as seen in the study's rejection of the null hypothesis.

Deater-Deckard (2017) associates parental stress to poor child emotion regulation and externalization. The findings align, as lower PSE (tied to stress from economic strain and isolation) would heighten teenagers' dysregulation, evident in issues like teen pregnancies and truancy in the study area. Deater-Deckard's earlier works on parenting stress emphasize that stressed parents feel less efficacious, leading to teenager problematic behaviours, which the study's correlation supports. Chinawa et al. (2021) in West Africa show self-regulation mediating resilience and coping. The Kakamega North findings merge, as PSE enhanced teenagers' coping (e.g., high confidence in change, mean = 4.95), mediating resilience amid post-COVID vices like substance abuse. Achieng et al. (2018) in urban Nairobi found that caregiver's behaviour fosters adolescents' assertiveness, affected by support and relationships. The rural Kakamega North study stresses this: while Achieng focused on rich urban parents, here PSE in poor families similarly shaped self-regulation, but with pandemic amplifiers like unsupervised time increasing risks. This study notes geographical and economic differences, and the findings yield similar positive PSE effects, suggesting generalizability across Kenyan contexts despite these variations.

Kakamega studies (e.g., Wanjala, 2023; Onyango & Natajaran, 2022) link self-regulation to academic achievement. The findings thrive on this by binding PSE to self-regulation amid post-COVID gaps (e.g., scarce rural data, as per KNBS, 2022), addressing the study's identified research gap in rural settings. This conclusion is also supported by the data collected from the interview schedule carried out on one of the teachers of Guiding and counseling, respondent G9 (2024) which portrayed the following scenario;

"*It's a good feeling when you look around and see your teenage children all grown and happy. There's a reason to thank God for their safety, especially in this day and age. I think this stems from own approval as a parent.*

Respondent G2 (2024) had the following with regards to her daughter's self-regulation;

"*My teenage girl does not want to talk to anyone. I encourage her that she will improve in her classwork but she seems to be in her own world. She doesn't believe in herself. I encourage her to continue trusting herself.*

Parents who feel more confident in their parenting roles may be more effective in providing the necessary guidance, support, and boundaries that enable their teenagers to develop and maintain self-regulation skills. Conversely, teenagers who possess stronger self-regulation abilities may respond more positively to their parents' guidance and influence, leading to improved behavior outcomes.

The findings are in agreement with those published in the Journal of Early Adolescence, which examined the effects of parental self-efficacy on early adolescents' self-regulated learning. The findings suggest that the higher parental self-efficacy is associated with increased parental support for learning, which in turn positively influences adolescents self-regulated learning behaviours. (journals.sagepub.com)

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Additionally, a systemic review highlighted the various roles of parental self-efficacy in associations with both parent and child variables. The review found that the higher parental self-efficacy is linked to more effective parenting practices, which contribute to better self-regulation to teenagers. (link.springer.com). The findings extend the literature by filling gaps in post-COVID rural African contexts, where stressors like economic instability and isolation (e.g., Gettleman, 2020; Ssempebwa & Carpenter, 2010) amplify PSE's importance. Unlike urban/affluent foci (e.g., Achieng et al.), this study shows PSE's role in mitigating rural-specific issues, informing tailored interventions like parenting training, as recommended.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Based on the provided correlation analysis, it's evident that there is a significant positive correlation between parental self-efficacy and teenager self-regulation among parents and teenagers in Kakamega North Sub County, Kenya. The Pearson correlation coefficient of 0.441, which is significant at the 0.01 level (2-tailed), indicates a moderately strong positive relationship between these two variables and therefore rejects the first null hypothesis $H_0$1: Parental self-efficacy has no statistically significant effect on teenager self-regulation of school-going teenagers in Kakamega North Sub-County, Kenya. This leads to a conclusion that Parental self-efficacy plays an important role in influencing teenager self-regulation. The positive correlation suggests that as parental self-efficacy increases, teenager self-regulation also tends to increase, and vice versa. This implies that parents who have higher confidence in their parenting abilities are likely to have teenagers who exhibit better self-regulation skills. In the context of Kakamega North Sub County, this finding could have important implications for understanding and promoting positive parenting practices and adolescent development.

5.2 Recommendations

The government should implement parenting programs to bolster self-efficacy. Parents can develop community initiatives aiming towards teenager self-regulation. Through the ministry of education, the government can integrate modules in school guidance and counseling's curricula.

REFERENCES

Achieng, B. O., Muturi, W., & Wanjare, J. (2018). Effect of equity financing options on financial performance of non-financial firms listed at the Nairobi Securities Exchange, Kenya. *Applied Economics and Finance, 5*(4), 105–118.

Afifu, C., Ajema, C., Suubi, K., Wandera, N., & Mugyenyi, C. (2021). Gendered impact of COVID-19: A policy analysis on the women workers in the urban informal economy in Kenya. Nairobi: International Center for Research on Women (ICRW).

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman.

Bearak, J., Popinchalk, A., & [Carmen]. (2021). Unintended pregnancy and abortion in the COVID-19 pandemic. *BMJ Global Health, 6*(12), e007151.

Bowlby, J. (1988). *A secure base: Parent-child attachment and healthy human development*. Basic Books.

Brodeur, A., Clark, A. E., Fleche, S., & Powdthavee, N. (2021). COVID-19, lockdowns and well-being: Evidence from Google Trends. *Journal of Public Economics, 193*, Article 104346. https://doi.org/10.1016/j.jpubeco.2020.104346

Brouzos, A., Vassilopoulos, S. P., Baourda, V., Tassi, C., Stavrou, V., Moschou, K., & Brouzou, K. O. (2021a). "Staying home – feeling positive": Effectiveness of an online positive psychology group intervention during the COVID-19 pandemic. *Current Psychology*, 1–13.

Brozou, M. (2021, August 31). 'I am not at peace': COVID-19 impacts on mental health of adolescents in Tanzania. [ODI Country Study]. Overseas Development Institute.

Chinawa, A. T., Chinawa, J. M., Ossai, E. N., Aronu, A. E., & Onukwuli, V. O. (2021). The COVID-19 pandemic: College adolescents' perception on school reopening in Nigeria. *Journal of Educational and Developmental Psychology, 11*(2), 1–10. https://doi.org/10.5539/jedp.v11n2p1

Deater-Deckard, K. (2017). Parent's and children's self-regulation: The role of parental stress and adversity. In D. J. Bridgett, M. R. Gartstein, & L. A. Van Huisstede (Eds.), *Handbook of self-regulatory process in development: New directions and international perspectives* (pp. 257–274). Routledge.

Gettleman, J. (2020, March 29). India's coronavirus lockdown leaves vast numbers stranded and hungry. *The New York Times*. https://www.nytimes.com/2020/03/29/world/asia/coronavirus-india-lockdown.htm

Licensed Under Creative Commons Attribution (CC BY-NC)

Imran, N., Aamer, I., Sharif, M. I., Bodla, Z. H., & Naveed, S. (2020). Psychological burden of quarantine in children and adolescents: A rapid systematic review and proposed solutions. *Pakistan Journal of Medical Sciences, 36*(5), 1106–1116. https://doi.org/10.12669/pjms.36.5.3088

ICRW. (2021, June 17). Intersectionality between health and education: The dilemma facing Kenyan adolescents amid COVID-19. International Center for Research on Women.

Inyanji, J. (2021, December 13). State raises concern over rising cases of defilement. *The Standard*, p. 15.

Jiao, W. Y., Wang, L. N., Liu, J., Fang, S. F., Jiao, F. Y., Pettoello-Mantovani, M., & Somekh, E. (2020). Behavioral and emotional disorders in children during the COVID-19 epidemic. *The Journal of Pediatrics, 221*, 264–266.e1. https://doi.org/10.1016/j.jpeds.2020.03.013

John-Baptiste, A., Moulin, M. S., & Ali, S. (2021). Are COVID-19 models blind to the social determinants of health? A systematic review protocol. *BMJ Open, 11*(7), e048995. https://doi.org/10.1136/bmjopen-2021-048995

Kenya National Bureau of Statistics. (2022). *2022 statistical abstract*. https://www.ke.

Khasakhala, E., Sichari, M., Bota, K., Ayaga, G., Wesonga, B., & Kokonya, D. (2023). Comorbidity of mental health and autism spectrum disorder: Perception of practitioners in management of their challenging behaviour. *International Journal of Developmental Disabilities, 69*(5), 731–742.

Kovesdi, A., Csikos, G., Toro, K., Hadhazi, E., Takas, S., Rozsa, S., & Foldi, R. (2021). The role of self-efficacy in adaptation regarding parental and child resilience: A longitudinal study on the two waves of COVID-19. In *Conference proceedings of the 16th European Conference on Psychological Assessment (ECPA 2021)*.

Lee, S., Santarelli, A., Choi, H., & Ashurst, J. (2021). Impact of the COVID-19 pandemic on emergency department transfers to a higher level of care. *Western Journal of Emergency Medicine, 22*(3), 561–564. https://doi.org/10.5811/westjem.2021.3.50907

Malava Subcounty Education Office. (2022). *Annual report on key challenges facing adolescents: Teenage pregnancies, drug abuse, and school dropouts in Malava Subcounty secondary schools*. Malava Subcounty Directorate of Education.

Martínez-del-Carmen, C., et al. (2021). Impact of the COVID-19 pandemic and psychosocial coping strategies in health sciences students at the University of Seville: A pilot study. *Healthcare, 9*(12), 1661. https://doi.org/10.3390/healthcare9121661

O'Connor, R. C., Wetherall, K., Cleare, S., McClelland, H., Melson, A. J., Niedzwiedz, C. L., & Robb, K. A. (2020). Mental health and well-being during the COVID-19 pandemic: Longitudinal analyses of adults in the UK COVID-19 mental health & wellbeing study. *The British Journal of Psychiatry, 218*(6), 326–333. https://doi.org/10.1192/bjp.2020.212

Onyango, R., & Natarajan, M. (2022). Gender equity approach to policing in Kenya: Lessons, challenges and prospects. *International Journal of Police Science & Management, 24*(1), 65–78.

Rodney, T., Josiah, N., & Baptiste, D.-L. (2021). Loneliness in the time of COVID-19: Impact on older adults. *Journal of Advanced Nursing, 77*(9), e24–e26. https://doi.org/10.1111/jan.14856

Ssempebwa, J. C., & Carpenter, D. O. (2010). The generation, use and disposal of waste crankcase oil in developing countries: A case for Kampala District, Uganda. *Journal of Hazardous Materials, 161*, 835–841.

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., & Ho, R. C. (2020). Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *International Journal of Environmental Research and Public Health, 17*(5), 1729. https://doi.org/10.3390/ijerph17051729

Wanjala, E. S. (2023). Self-efficacy in climate action: Perspectives from Kenyan youth activists. *Journal of Environmental Psychology, 85*, Article 101932.

Wekullo, C. S., Shiundu, J. O., Ouda, J. B., & Mutevane, A. (2022). COVID-19 crisis and the future of higher education: Perspectives from Kenya. In *Global higher education during COVID-19: Policy, society, and technology* (pp. 73–92).

Wilson, D. H. E., Johnson, B. A. M., Stokan, E., & Overton, M. (2020, May 30). Institutional collective action during COVID-19: Lessons in local economic development. *Public Administration Review, 80*(5), 862–865. https://doi.org/10.1111/puar.13234

World Health Organization. (2020). *Mental health and psychosocial considerations during the COVID-19 outbreak* (WHO/2019-nCoV/Mental_Health/2020.1). https://www.who.int/publications-detail-redirect/WHO-2019-nCoV-MentalHealth-2020.1

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Perceived organisational support and organisational citizenship behaviour: Key insights from institutions of higher learning in Kabale District, Uganda

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ABSTRACT

This study evaluated the relationship between perceived organisational support and organisational citizenship behaviour among higher education institutions in Kabale District. The study was guided by Social Exchange Theory and followed a descriptive cross-sectional survey design targeting a total of 269 staff members, which included top management, administration, and academic and non-academic staff of the three selected institutions of higher learning in Kabale District. Using purposive and simple random sampling techniques, quantitative data was collected from 235 respondents using a structured questionnaire. Data was then analysed quantitatively using descriptive analysis, which entailed frequency and percentages, and tables were used to present the data. At the bivariate level, a Pearson correlation matrix was used to ascertain the relationships between organisational support and organisational citizenship behaviour. The findings revealed that all the constructs of perceived organisational support – fair treatment, career development and rewards and recognition – had a strong and positive correlation to organisational citizenship behaviour among institutions of higher learning in Kabale District, as indicated by ($r = .662$, $p < 0.01$), ($r = .656$, $p < 0.01$) and ($r = .729$, $p < 0.01$), respectively. The study concluded that perceived organisational support had a significant impact on organisational citizenship behaviour. The study recommends that institutions should regularly engage staff through open-door policies, mentorship programmes and feedback mechanisms to promote a culture of support and recognition. Design and implement structured recognition programmes for staff who demonstrate high levels of commitment, innovation, teamwork and voluntary contributions beyond their job roles. Offer staff continuous capacity-building workshops, scholarships for further studies and regular participation in academic conferences and training and Ensure transparency in promotions, task allocation and conflict resolution processes. Promote equity and inclusion across all academic and administrative departments.

Keywords: Fair Treatment, Institutions of Higher Learning, Kabale District, Organisational Citizenship Behaviour, Perceived Organisational Support, Uganda

I. INTRODUCTION

The organizational landscape in today's era is very dynamic making it increasingly important to understand the factors that influence employee behavior and performance in order to nature a productive and supportive workplace environment. The main key factors that have garnered significant focus in organizational research are Perceived Organizational Support (POS) and Organizational Citizenship Behavior (OCB). Eisenberger et al., (2020) defines perceived organizational support as the employees' perceptions of how much their organization values their efforts and contributions towards the organizations success and how much the organization cares about their well-being while on the other hand, organizational citizenship behavior incorporates voluntary and extra-role behaviors that extend beyond formal job responsibilities but are also necessary for improving the overall effectiveness of the organization. These behaviors may include helping needy colleagues, adjusting to job demands and promoting the organization positively. Bogler and Somech (2004) affirm that organizational success cannot be achieved solely through the formal duties of the employees especially in the highly competitive and dynamic environment of educational institutions like universities and colleges. Therefore recognizing the importance of employees' organizational citizenship behavior is very crucial in the higher education sector especially for maintaining and sustaining institutional efficiency (DiPaola & Hoy, 2005). As early as 1938, Barnard emphasized that the cooperative efforts of individuals were critical to achieving organizational goals and that the willingness of individuals to go beyond their formal job roles has long been seen as a key contributor to organizational success.

The concept of organizational citizenship behavior first emerged in the late 1970s and was later formally defined in the 1980s though its roots can be traced back to the 1930s (Ocampo et al., 2018). The important contribution of

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employees' extra-role behaviors in the workplace was first identified by Katz and Kahn in 1996 but it was Bateman and Organ (1983) who introduced the term "organizational citizenship behavior." The concept of OCB is grounded in the idea that an individual's willingness to cooperate and do extra for the organization is essential and invaluable to any organization and it goes beyond simply joining, remaining with the organization and meeting performance expectations, but rather employees are encouraged and expected to voluntarily exceed their expected roles (Worku & Debela, 2024). Globally numerous studies have shown a positive relationship between Perceived Organizational Support and Organizational Citizenship Behavior. It has been noted that employees who perceive higher levels of support from their organization are more likely to voluntarily engage in citizenship behaviors that are motivated by a sense of duty and reciprocity towards the organization (Rhoades & Eisenberger, 2002). However, much of this research has been carried out in Western contexts, where organizational dynamics and cultural factors differ significantly from those in Uganda. Organizational citizenship behavior involves voluntary actions that go beyond the formal job requirements but have a positive impact on the organization in the long run. Such behaviors may include but not limited to, assisting coworkers, being punctual and showing additional effort beyond the basic expectations. OCB is associated with better organizational performance, increased employee morale and enhanced workplace harmony. These actions are not outlined in job descriptions but they extend beyond formal roles and are not explicitly defined and they do not incur penalties for unmet deadlines and also require employees to give more than what is expected of them (Worku & Debela, 2024).

Perceived organizational support has become an important factor in enhancing productivity and achieving organizational goals. Güven (2018) notes that employees are more likely to outdo themselves and to contribute effectively to organizational success when they feel supported by their organizations. In a work environment where such support is lacking, employees may seek transfer opportunities to other organizations and show minimal effort in fulfilling their job responsibilities. Consequently, it has emerged that supporting organizational members is vital and that perceived organizational support positively influences the motivation of employees within the organization (Güven, 2018). Many previous studies have demonstrated that Organizational Citizenship Behaviors are linked to both individual and organizational performance. Given the significance of OCBs for improving individual and organizational effectiveness, the aim of this study is to explore OCBs within the higher education context by examining the relationships between OCBs and their various components and assess the level of attention institutional leaders should give to the OCBs of both faculty and professional staff.

With the growing demand for accountability in higher education especially in Uganda, institutional leaders focus on ensuring the effective functioning of their organizations and as much as institutional chancellors and council members may not be directly concerned with the individual citizenship behaviors of faculty and staff, they are interested in the long-term effects of these behaviors at an aggregate level because research has shown that such behaviors are linked to organizational success (Podsakoff et al., 2009). Therefore, although top leaders may not focus on the daily actions of faculty and staff, they are likely to observe the collective outcomes of their performance and perceived organizational support can help them achieve this by looking at how employees perceive the level of appreciation for their contributions and the organization's concern for their well-being. On the other hand, organizational citizenship behavior involves employees engaging in activities outside their official job description which contribute positively to the organization success as a whole (Nikhil & Arthi, 2019). Organizational support encompasses key factors such as fair treatment, rewards and recognition, career development, job security and welfare. It involves prioritizing the interests of employees, ensuring fairness, addressing their demands and concerns and acknowledging the positive contributions they make. By meeting the needs and desires of employees, organizations can foster desired behaviors leading to improved productivity (Güven, 2018). In this study, Perceived Organizational Support will be assessed by examining these core components, including fair treatment, career development, rewards and recognition, job security and welfare, all of which contribute to enhanced employee engagement.

1.1 Statement of the Problem

In the context of higher institutions of learning, employees are ideally expected to exhibit Organizational Citizenship Behaviour voluntary which includes non-contractual behaviours such as being punctual, helping colleagues, demonstrating loyalty and engaging in institutional activities beyond their job descriptions. Such citizenship behaviours are very crucial for enhancing institutional effectiveness, promoting teamwork and improving service delivery in educational settings (Podsakoff et al., 2016). However, the reality in higher institutions of learning in Uganda and most especially Kabale District paints a different picture. There institutions are faced with increasing concern over staff detachment, limited or rather zero cooperation among colleagues, reluctance to take initiative and low commitment to institutional goals. A study by Tagulwa et al. (2023) on public universities in Uganda pointed out that only 42% of the academic staff showed consistency and willingness to go beyond their formal job responsibilities. In Kabale District specifically, informal reports from institutional administrators point to frequent delays in program delivery, low involvement in co-curricular activities and resistance to institutional changes all of which are symptoms of diminishing citizenship behaviour among the employees. The Uganda National Council for Higher Education and the Ministry of

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Education and Sports have developed several policy interventions aimed at strengthening human resource practices including staff capacity-building initiatives, institutional quality assurance frameworks and performance-based reward systems (Aspinall & McLaughlin, 2019). However, these measures have had limited impact particularly in rural or upcountry institutions due to inconsistencies in implementation, resource constraints and inadequate institutional leadership. Several challenges remain unsolved in most of the institutions including; poor recognition and reward systems, limited career advancement opportunities, weak organizational support and the absence of participatory leadership styles (Tumwine, 2024). These issues can be attributed to a lack of alignment between policy and practice, budgetary limitations and a culture of minimal compliance that does not promote voluntary citizenship behaviours. If this study is not conducted, most institutions of higher learning in Kabale District may continue to face low employee engagement, poor service delivery and institutional inefficiencies ultimately affecting the quality of education and student satisfaction. The researcher was motivated to undertake this study after observing the challenges of low staff involvement and commitment within these higher education institutions in Kabale district. Furthermore, there is a limited body of research on OCB within the context of rural Ugandan despite its recognized importance in enhancing institutional effectiveness and employee well-being. The study therefore sought to fill this gap by evaluating the effect of OCB on POS and offering recommendations for improved human resource management in higher learning institutions.

1.2 Research Objectives

i. To examine the relationship between fair treatment and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District.
ii. To determine the relationship between career development and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District.
iii. To establish the relationship between rewards and recognitions and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by the Social Exchange Theory as advanced by Kelley in 1959. According to this theory, employees normally form reciprocal relationships with their organization where the perceived support from the organization positively impacts their commitment, loyalty and performance. Employees usually engage with organizations with the expectation of mutual benefits and whenever they perceive support of any kind from the organisations, they see it as a positive exchange motivating them to reciprocate their behaviour through Organizational Citizenship Behaviours (Cropanzano & Mitchell, 2005). According to Gergen (1975) the theory is based on the assumption that human social life is a continuous interaction and that exchange exists between two or more parties where one party often reciprocates the positive actions of the other. The social exchange process usually starts when an individual employee within an organization interacts with another employee either in a positive or negative manner. The Social Exchange Theory has been adopted by many researchers to explain how employees can develop a positive attitudes toward their organization (Blau, 1964). The theory is also based on the notion that trust, loyalty and commitment are developed and exchanged between the employee and the employer (Cropanzano & Mitchell, 2005). Additionally, when an organization provides the necessary resources to its employees, it leads to increased satisfaction, engagement and commitment (Musgrove et al., 2014) leading the employees to reciprocate the benefits they have received from the organization. Essentially, when one party treats another positively, the principle of reciprocity fosters favorable outcomes and the exchange of costs and benefits applies to both employers and employees. When an organization provides better pay, job security and other intrinsic rewards and eventually employee satisfaction tends to increase (AbuKhalifeh & Som, 2013).

2.2 Empirical Review

2.2.1 Fair Treatment and Organizational Citizenship Behavior

Fairness treatment or justice perceptions refer to whether employees believe that organizational decisions are made fairly and with adequate input from employees (referred to as procedural justice) and whether they feel their rewards are equitable in relation to their training, tenure, responsibilities or workload (known as distributive justice). Perceptions of fairness are positively linked to Organizational Citizenship Behavior (Moorman, 1991). This term reflects individuals' views on the fairness of decisions and decision-making processes within an organization and how these perceptions influence behavior. Organizational justice refers to employees' perceptions of whether the organization is fair or unfair. These perceptions are linked to critical factors such as commitment, citizenship behaviors, satisfaction and performance. (Moorman, 1991).

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In today's competitive environment organizations strive to retain top talent and outperform competitors by finding new ways of doing things. Employees are increasingly aware of their rights and expect their employers to act justly and fairly at all times. As a result fairness has become a crucial factor that organizations must focus on, as it directly influences workplace attitudes and behavior. Organizational justice is a key determinant of Organizational Citizenship Behavior as it explains why employees may retaliate against unfair outcomes, processes or interactions (Deww, 2011). When employees perceive that they are treated fairly in all aspects by their organization they are more likely to display positive attitudes and behaviors such as increased job satisfaction. Issues such as the allocation of resources, hiring practices, policy-making and decisions that affect both decision-makers and those impacted by those decisions require careful attention to fairness (Deww, 2011). The relationship between organizational fairness and OCB is seen as a potential explanation for how organizational justice affects OCB (Chhetri, 2014).

Several studies have been done different scholars to try and link fair treatment and organizational citizenship behavior. A study by Ehtesham et al. (2011) explored the relationship between organizational justice and citizenship behavior in Pakistan. Using an exploratory research approach, they gathered primary data through questionnaires from 140 employees at the COMSATS Institute of Information Technology, including both male and female faculty members. Statistical analysis using regression and correlation revealed that involvement in decision-making was strongly correlated with consistency and adaptability. Additionally, other dimensions of organizational culture were positively related to performance management practices. Najafi et al., (2011) examined the causal relationships between organizational justice, psychological empowerment, organizational commitment, job satisfaction, and OCB focusing on the mediating roles of job satisfaction and organizational commitment. Their study which surveyed 280 educational experts from universities they found out that organizational justice directly influenced job satisfaction, psychological empowerment and turnover intentions. Psychological empowerment positively influenced both job satisfaction and organizational commitment which, in turn, positively affected OCB. The researchers concluded that organizational justice and psychological empowerment enhance job satisfaction and organizational commitment, ultimately improving OCB. On the contrary however, Batool (2013) in his empirical study on transformational leadership on organizational commitment in the banking sector in Pakistan found that organizational justice did not have a significant positive effect on OCB. Similarly, Gharagheieh and Shokri (2014) confirmed a significant positive relationship between organizational justice and OCB in a study conducted in Iran's Social Security Organization and in the context of educational organizations in Malaysia, research showed that fairness positively influenced teachers' OCB.

2.2.2 Career Development and Organizational Citizenship Behavior

Career development refers to enhancing the intellectual or emotional skills necessary for improving job performance. It plays a crucial role in employee performance with organizations taking formal steps to ensure that qualified and experienced employees are available when needed. To promote discipline and career development, organizations must provide training programs to support employees who demonstrate time discipline and a strong sense of responsibility, ultimately improving performance (Manansal et al., 2016). According to Hidayat et al., (2022), empowering board members by improving their competence and discipline can boost motivation and enhance their performance. The influence of career development on organizational citizenship behavior was tested using a t-test which produced a t-value of 4.379 with a significance level of 0.000. These result supports the hypothesis indicating a positive and significant relationship between career development and organizational citizenship behavior in the Mold Manufacturing Department of PT. Similarly, Priyanka and Sripirabaa (2016) conducted a study to assess how organizational citizenship behavior (OCB) impacts employees' intention to stay. The study concluded that OCB positively influences the intention to stay, highlighting the importance of OCB in organizations as it is linked to employees' commitment to remaining in their roles. Therefore, organizations should foster work environments that encourage responsibility within teams.

2.2.3 Rewards and Recognition and Organizational Citizenship Behavior

Zhao et al., (2022) asserts that organizational rewards also known as extrinsic rewards are often seen as outcomes of organizational citizenship behavior (OCB). Numerous empirical studies have shown that employees who consistently engage in OCB are more likely to receive organizational rewards, such as promotions, salary increases, recognition, and special acknowledgment. Alkahtani (2015) in his study of organizational citizenship behavior and how it influences rewards argued that OCB is expected to influence rewards with the norm of reciprocity providing a likely explanation for this positive effect. This norm suggests that when employees perform actions that benefit the organization, such as helping colleagues with their work or covering for absences, the organization reciprocates by offering rewards, such as promotions or bonuses. This exchange is viewed from a social exchange perspective, where the organization feels an obligation to reward employees for their valuable contributions, ensuring equitable social exchanges. Ibrahim et al., (2021) also conducted a study on the effects of intrinsic rewards on organizational citizenship behavior in the tourism sector in Egypt and their study highlighted the strong connection between intrinsic rewards and OCB, emphasizing that OCB is driven by internal motivations. Intrinsic rewards enhance OCB by fostering a supportive

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social and emotional environment which in turn positively impacts organizational performance. Employees' OCB helps improve organizational efficiency and the integration of new employees, contributing to the overall development of the organization. Similarly, Asadullah et al., (2021) studied the moderating role of leader's emotional intelligence on job characteristics and organizational citizenship behavior among the employee working in the construction sector in Pakistan and their findings stressed the importance of supporting employees, rewarding their performance and ensuring job satisfaction, which eventually positively influence employees' OCB especially in the construction industry. The impact of rewards on OCB is further evidenced by studies such as those by Lidinnillah et al., (2019), which found a direct positive relationship between rewards and organizational citizenship behavior, and Zhao et al. (2022), who studied the impact of positive verbal rewards on organizational citizenship behavior while considering the mediating role of psychological ownership and affective commitment and their findings also confirmed that rewards are positively correlated with OCB. These studies suggest a direct influence of rewards on OCB.

III. METHODOLOGY

3.1 Research Design

This study adopted a descriptive cross-sectional survey design to explore how Organizational Citizenship Behavior (OCB) is conceptualized and its antecedents within management studies. As noted by Kothari and Garg (2014), a descriptive design enables researchers to present and relate existing facts. Specifically, a descriptive cross-sectional survey design research design seeks to gather data to systematically describe a phenomenon, situation or population. It is particularly useful for answering questions related to what, when, where and how concerning the research problem.

3.2 Target Population

This study focused on higher education institutions in Kabale District. As of the end of 2023, these institutions employed a total of 269 staff members across various departments (Human Resource Departments and Payroll Records, 2025). This study was conducted in selected institutions in the district, including Uganda College of Commerce (UCC) with 87 employees, National Teachers College Kabale (NTC) with 90 employees and Bishop Barham College University with 92 employees. Inferences were drawn from management at all levels (top, middle and low) as well as other staff members from each department. The overall distribution of the population by department.

Table 1

Study Population

Category of Respondents	**Selected Institutions**						**Total population**	
	UCC		**NTC**		**BBCU**			
Top Management	6	6	5	5	7	7	18	18
Administration	5	5	10	10	19	15	34	30
Academic	44	40	40	35	40	36	124	111
Non -academic	32	28	35	28	26	20	93	76
Total	**87**	**79**	**90**	**78**	**92**	**78**	**269**	**235**

3.3 Sample Size Determination and Sampling Procedure

Based on the Morgan table, a sample size of 235 respondents was drawn from the total study population of 269 individuals. Then proportionate sampling was used to determine the sample size of the respondents in each category.

Table 2

Sample Size Determination and Sampling Procedure

Category of Respondents	**Total population**	**Sample Size**	**Sampling criteria**
Top Management	18	18	purposive
Administration	34	30	purposive
Academic	124	111	Simple random
Non -academic	93	76	Simple random
Total	**269**	**235**	

3.4 Sampling Techniques

Sampling was conducted to choose specific elements from the total population to represent it. Both purposive sampling and random sampling techniques were used in this study. Purposive sampling*:* involved identifying and selecting individuals or groups who possess expertise and experience related to the phenomenon being studied (Creswell & Plano Clark, 2023). The sampling was focusing on selecting top management and administration. Random Sampling*:* allows every individual in the population a chance to be selected in the study. A randomly chosen sample is intended to

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provide an unbiased representation of the entire population. This was applied on the academic and non-academic staff members.

3.5 Data Collection Instrument

The researcher gathered quantitative data through structured questionnaire. This tool was used to collect data from various stakeholders in higher education institutions within the study area. Primary data was obtained directly from respondents through questionnaires administered to these stakeholders to gather the necessary information.

3.5 Data Analysis

The responses were coded and data analysis was done using the Statistical Package for Social Sciences (SPSS), creating a dataset for both descriptive and inferential statistical analysis. To enhance the interpretability of the data, descriptive statistics such as frequencies and percentages were used to summarize the data. Additionally, inferential statistical techniques were employed, including correlation analysis, Pearson correlation analysis to conduct significance tests.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

Response rate is the ratio of the actual number of respondent's vis-à-vis the targeted. The researcher had targeted to get information from the various respondents and got the following.

Table 3

Response Rate

Respondents	Proposed sample	Actual sample	Percentage (%)
Top Management	18	18	100
Administration	34	30	88.2
Academic	124	111	90
Non -academic	93	76	82
Total	**269**	**235**	**93**

This statement means that 93% of the study's target participants responded to the research. This is considered a very good response rate because it exceeds minimum threshold of 70% for research to be considered valid and reliable.

4.1.1 The Relationship between Fair Treatment and Organisational Citizenship Behaviour among Institutions of Higher Learning in Kabale District.

Examining the the relationship between fair treatment and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District was the first goal. The primary sources provided the data needed to accomplish this.

Table 4

Summary of the descriptive findings on Fair Treatment

Fair Treatment	Agree		Undecided		Disagree	
	F	%	F	%	F	%
My organization really cares about my well-being.	200	85.2	00	00	23	9.8
My organization strongly considers my goals and values.	198	84.3	00	00	37	14.8
My organization shows little concern for me.	10	4.3	00	00	225	95.7
My organization cares about my opinions	200	85.2	00	00	23	9.8
My organization is willing to help me if I need a special favor.	211	89.8	00	00	24	10.2
Help is available from my organization when I have a problem.	198	84.3	00	00	37	14.8
My organization would forgive an honest mistake on my part	188	80.9	00	00	47	19.1
If given the opportunity, my organization would take advantage of me.	211	89.8	00	00	24	10.2
My organization would forgive an honest mistake on my part	188	80.9	00	00	47	19.1

Table 4 above analyses the statements given to respondents to assess the relationship between fair treatment and organizational citizenship behaviour among Kabale District's higher education institutions. When respondents were asked if the organization truly cares about their well-being, 85.2% agreed and 9.8% disagreed. When asked if the organization strongly considers my goals and values, 48.3% agreed and 14.8% disagreed with the statement. Respondents were asked if their organization shows little concern for me; 4.3% agreed with the statement, while 94.7%

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strongly disagreed. Respondents were asked if organization cares about my opinions, 85.2% of the respondents agreed with the statement compared to 9.8% of the respondents who disagreed. When respondents were asked if their organization was willing to help them if they needed a special favor, 89.8% agreed with the statement, while 10.2% disagreed. When asked if my organization can help me when I have a problem, 89.8% agreed, with 10.2% disagreeing. Finally, respondents were asked if the organization would forgive an honest mistake on my part. 84.3% agreed, while 14.8% disagreed with the statement.

4.1.2 The Relationship between Career Development and Organizational Citizenship Behaviour among Institutions of Higher Learning in Kabale District.

The second objective was aimed at to determine the relationship between career development and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District. The data to achieve this was obtained from the primary sources and a summary of the responses is presented in the table below.

Table 5

Summary of the descriptive findings on Career Development

Career Development	Agree		Undecided		Disagree	
	F	%	F	%	F	%
Willingly give your time to help others who have work-related problems	196	83.4	00	00	39	16.6
Adjust your work schedule to accommodate other employees' requests for time off.	198	84.3	00	00	37	14.8
Go out of the way to make newer employees feel welcome in the work group.	9	3.8	00	00	226	96.2
Assist others with their duties.	200	85.2	00	00	23	9.8
Attend functions that are not required but that help the organizational image.	211	89.8	00	00	24	10.2
Defend the organization when other employees criticize it.	198	84.3	00	00	37	14.8
Offer ideas to improve the functioning of the organization.	188	80.9	00	00	47	19.1
Take action to protect the organization from potential problems.	211	89.8	00	00	24	10.2
I shows pride when representing the institution in public	188	80.9	00	00	47	19.1
I offer ideas to improve the functioning of the institution.	200	85.2	00	00	23	9.8

The statements in the table above were used to determine the relationship between career development and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District. Respondents were asked if they willingly give their time to help others who have work-related problems, 83.4% of the respondents agreed with the statement as compared to 16.6% of the respondents who disagreed. When asked if Adjusting respondents work schedule to accommodate other employees' requests for time off, 84.3% of the respondents agreed compared to 14.8% of the respondents who disagreed. Respondents were asked if they go out of their way to make newer employees feel welcome in the work group, 3.8% of the respondents agreed compared to 96.2% who disagreed. Respondents were asked if they assist others with their duties, 85.2% of the respondents agreed with the statement compared to 9.8% who disagreed with the statement. Respondents also were asked whether they Attend functions that are not required but that help the organizational image, 89.8% of the respondents agreed with the statement compared to 10.2% Respondents were asked if they defend the organization when other employees criticize it, 84.3% of the respondents agreed with the statement compared to 14.8% of the respondents. Once more respondents were asked if Offer ideas to improve the functioning of the organization 80.9% of the respondents agreed leaving 14.8% in disagreement. Respondents were asked whether they take action to protect the organization from potential problems, 89.9% of the respondents agreed with the statement compared to 10.2% of the respondents. Respondents were asked if they show pride when representing the institution in public, 80.9% of the respondents agreed with the statement leaving 19.1% of the respondents. Lastly respondents were asked if they offer ideas to improve the functioning of the institution, 85.2% of the respondents agreed compared to 9.8% of the respondents who disagreed.

4.1.3 The Relationship between Rewards and Recognitions and Organisational Citizenship Behaviour among Institutions of Higher Learning in Kabale District.

The third objective was aimed at establishing the relationship between rewards and recognitions and Organisational Citizenship Behaviour among institutions of higher learning in Kabale District. The data to achieve this was obtained from the primary sources. A summary of the responses is presented in the table below.

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Table 6

Summary the descriptive findings on Rewards and Recognitions

Rewards and Recognitions	Agree		Undecided		Disagree	
	F	%	F	%	F	%
All disputes in the Institution are handled with all fairness	200	85.2	00	00	23	9.8
Resources allocation are done with due process in this institution	198	84.3	00	00	37	14.8
Unresolved disputes are handled with transparency	10	4.3	00	00	225	95.7
Grievances are handled fairly	200	85.2	00	00	23	9.8
There is Improved working conditions of staff	211	89.8	00	00	24	10.2
The level of appreciation is justified, based on employee's performance	198	84.3	00	00	37	14.8
The method of appraisal is appropriate for the work completed	188	80.9	00	00	47	19.1
All employees have equal opportunities for career development	211	89.8	00	00	24	10.2

Respondents were asked whether all disputes in the Institution are handled with all fairness, 85.2% agreed with the statement leaving 9.8% undecided. Once again when asked whether resources allocation are done with due process in this institution, 84.3% of the respondents agreed with the statement compared to 14.8% of the respondents who disagreed with the statement. Respondents were asked if unresolved disputes are handled with transparency, 4.5% of respondents agreed with the statement compared to 95.7% who disagreed with the statement. When asked if Grievances are handled fairly 85.2% of the respondents agreed with the statement compared to 9.8% of the respondents who disagreed. Respondents were asked if there is improved working conditions of staff, 89.8% of the respondents agreed with the statement leaving 10.2% in disagreement. Respondents were once again asked if the level of appreciation is justified, based on employee's performance 84.3% of the respondents agreed leaving 14.8% of the respondent in disagreement. Respondents were asked whether the method of appraisal is appropriate for the work completed, 80.9% of the respondent agreed with the statement compared to 19.1% of the respondents in disagreement. Lastly respondents were asked if all employees have equal opportunities for career development, 89.8% of the respondents agreed with the statement compared to 10.2% of the respondents.

4.1.4 Empirical Finding on Organizational Citizenship Behavior

This section summarizes the findings on organizational citizenship behavior.

Table 7

Summary of the findings on Organizational Citizenship Behavior

Organizational Citizenship	Agree		Undecided		Disagree	
	F	%	F	%	F	%
Willingly give your time to help others who have work-related problems	200	85.2	00	00	23	9.8
Adjust your work schedule to accommodate other employees' requests for time off.	198	84.3	00	00	37	14.8
Go out of the way to make newer employees feel welcome in the work group.	10	4.3	00	00	225	95.7
Assist others with their duties.	200	85.2	00	00	23	9.8
Attend functions that are not required but that help the organizational image.	211	89.8	00	00	24	10.2
Defend the organization when other employees criticize it.	198	84.3	00	00	37	14.8
Offer ideas to improve the functioning of the organization.	188	80.9	00	00	47	19.1
Take action to protect the organization from potential problems.	211	89.8	00	00	24	10.2
I show pride when representing the institution in public	200	85.2	00	00	23	9.8
I offer ideas to improve the functioning of the institution.	198	84.3	00	00	37	14.8

Respondents were asked if they willingly give your time to help others who have work-related problems, 85.2% of the respondents agreed compared to 9.8% of the respondents. Respondents were asked if their organization adjust their work schedule to accommodate other employees' requests for time off, 84.3% of the respondents agreed with the statement compared to 14.8% of the respondent. Respondents were asked if Go out of the way to make newer employees feel welcome in the work group, 4.3% of the respondents agreed with the statement compared to 95.7% of the respondents who disagreed. Once again respondents were asked if Assist others with their duties. 85.2% of the respondents agreed with the statement compared to 9.8% of the respondents who disagreed. Respondents were asked if Attend functions that are not required but that help the organizational image, 89.8% of the respondents agreed compared to 10.2% of the respondents. Respondents were asked if they defend the organization when other employees criticize it, 84.3% of the respondents agreed compared to 14.8% of the respondents who disagreed. Respondents were asked if they offer ideas to improve the functioning of the organization, 80.9% of the respondents agreed with the statement leaving 19.1% of the respondents in disagreement, respondents were asked if they take action to protect the organization from

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potential problems, 89.8% of the respondents agreed with the statement leaving 10.2% of the respondents in disagreement. Respondents were asked if they show pride when representing the institution in public 85.2% of the respondents agreed with the statement compared to 9.8% of the respondent. Lastly respondents were asked if they offer ideas to improve the functioning of the institution 84.3% of the respondents agreed compared to 14.8% of the respondents in disagreement.

4.2 Correlation Analysis Results

Table 8 presents correlation analysis between fair treatment and organizational citizenship behavior.

Table 8

Correlation Analysis: Fair treatment and organizational citizenship behavior

		Organisational Citizenship Behaviour	Fair Treatment
Organisational Citizenship Behaviour	Pearson Correlation	1	.662**
	Sig. (2-tailed)	.000	.000
	N	235	235
Fair Treatment	Pearson Correlation	.662**	1
	Sig. (2-tailed)	.000	.000
	N	235	235

**. Correlation is significant at the 0.01 level (2-tailed).

The data in Table 8 shows a strong positive correlation between Fair Treatment and Organizational Citizenship Behavior (OCB) with a correlation coefficient of r = .662. This means that when employees perceive they are being treated fairly such as being respected, valued and equitably rewarded, they are more likely to engage in positive voluntary behavior that support the organization like helping coworkers, showing initiative and being loyal. The p-value of less than ($p=0.000 < 0.01$) indicates that this correlation is statistically significant at the 1% level. This means there is a very low likelihood (less than 1%) that this observed relationship occurred by chance.

The findings are in line with findings from previous scholar's studies and theories on organizational justice. According to Moorman (1991), perceptions of fairness both distributive and procedural are critical predictors of OCB. Employees in Kabale's higher education institutions appear to mirror this as fairness in treatment fosters an environment where they willingly go beyond contractual obligations. Similarly, Deww (2011) found out that fairness in organizational practices enhances trust and satisfaction thereby motivating employees to display positive discretionary behaviors. This study confirms that when staff feel valued and respected, they invest back into the institution through OCB. Similarly, empirical evidence from other scholars strengthens this conclusion. Najafi et al., (2011) demonstrated that justice perceptions foster psychological empowerment, satisfaction and commitment all of which directly fuel OCB. Nevertheless, the findings differ from Batool (2013), who found no significant effect of organizational justice on OCB in Pakistan's banking sector. This discrepancy could be attributed to contextual factors such as cultural norms, sectorial differences or the level of autonomy afforded to employees in educational institutions as compared to banking institutions. Moreover, the results further resonate with Ehtesham et al. (2011) and Gharagheieh and Shokri (2014), who confirmed a positive and significant link between fairness and OCB in both educational and social security contexts. This suggests that the positive influence of fair treatment on OCB is not only context specific but also robust across different organizational settings.

Table 9

Correlation Analysis: Career development organizational citizenship behavior

		Organisational Citizenship Behaviour	Career Development
Organisational Citizenship Behaviour	Pearson Correlation	1	656**
	Sig. (2-tailed)	000	.000
	N	235	235
Career Development	Pearson Correlation	.656**	1
	Sig. (2-tailed)	.000	000
	N	235	235

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9 clearly shows that career development and Organisational Citizenship Behaviour have a considerable positive association ($r=.656$, $p< 0.01$). The results presented indicate a strong positive correlation between career

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development and Organizational Citizenship Behavior (OCB). The correlation coefficient (r = .656) suggests that as opportunities for career development increase within an organization, employees are more likely to exhibit positive discretionary behaviors such as helping others, being loyal and going beyond their job descriptions (which are characteristics of OCB). The p-value of less than 0.01 ($p < 0.01$) indicates that this relationship is statistically significant at the 1% level. In other words, there is less than a 1% probability that this strong correlation is due to chance.

The results suggest that career development is a key driver of OCB in higher education institutions. When employees perceive that their organizations are investing in their personal and professional growth, they are motivated to reciprocate through discretionary efforts that benefit the organization. These finding are supported by Manansal et al., (2016) who emphasized that training and development not only improve skills but also instill discipline and a sense of responsibility which in turn enhances organizational performance. Similarly, Hidayat et al., (2022) confirmed that empowering employees through competence development significantly improves motivation and performance which aligns with the current study's finding that career development encourages voluntary behaviour supportive of institutional goals. The results also resonate with Priyanka and Sripirabaa (2016) who found that OCB contributes to employees' intention to stay implying that organizations that prioritize career development foster loyalty and retention. This is particularly relevant for higher learning institutions where retaining skilled staff is critical for sustaining quality education and institutional competitiveness. However, the strength of this relationship may vary across sectors. For instance, in manufacturing contexts such as the study by Hidayat et al., (2022), structured skill enhancement programs had a direct effect on OCB, while in higher education, career development may also encompass intellectual growth, academic mentoring, and research opportunities. Thus, while the relationship is consistently positive, the drivers of career development may differ depending on the organizational context.

Table 10

Correlation Analysis: Rewards and recognition and organizational citizenship behavior

		Organisational Citizenship Behaviour	**Rewards and Recognition**
Organisational Citizenship Behaviour	Pearson Correlation	1	.729**
	Sig. (2-tailed)	.000	.000
	N	235	235
Rewards and Recognition	Pearson Correlation	.729**	1
	Sig. (2-tailed)	.000	.000
	N	235	235

**. Correlation is significant at the 0.01 level (2-tailed).

It is evident from Table 10 that there is a positive significant correlation between rewards and recognition and Organisational Citizenship Behaviour ($r= .729$, $p< 0.01$). This finding means that rewards and recognition are associated with Organisational Citizenship Behaviour. The correlation coefficient (r = .729) suggests that as rewards and recognition increase within an organization, employees are more likely to exhibit positive discretionary behaviors in line with organizational citizenship. The p-value of less than 0.01 ($p < 0.01$) indicates that this relationship is statistically significant at the 1% level.

The results demonstrate that rewards and recognition play a vital role in fostering OCB within higher education institutions. When employees are acknowledged for their contributions whether through promotions, salary increases, public praise or intrinsic appreciation, they are motivated to reciprocate by engaging in extra-role behaviour that benefit the organization. The results align with Zhao et al., (2022) who established that employees who engage in OCB are more likely to be rewarded through promotions and recognition thereby reinforcing the behaviour. Similarly, Alkahtani (2015) argued that rewards and recognition strengthen OCB because employees perceive them as fair returns for their extra efforts. In the case of institutions of higher learning in Kabale, recognition may also come in the form of academic acknowledgment, leadership opportunities, or involvement in decision-making, which all encourage staff to extend their commitment to organizational goals. The findings also resonate with Ibrahim (2021) who emphasized that intrinsic rewards such as appreciation, respect and a supportive work environment boost employees' intrinsic motivation to perform OCB. Moreover, Asadullah et al., (2021) highlighted that rewards enhance job satisfaction and encourage OCB across industries, including construction. Similarly, Lidinnillah et al. (2019) confirmed a direct positive relationship between rewards and OCB, supporting the robustness of the Kabale findings. The consistency of evidence across different organizational contexts indicates that the link between rewards and OCB is not sector-specific but rather a universal organizational phenomenon. From a theoretical lens, the findings reinforce social exchange theory where rewards and recognition strengthen the psychological contract between employees and employers. Employees who feel valued through recognition and tangible or intangible rewards are more willing to invest discretionary effort back into the organization.

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V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

From the findings, the study concluded that there was a strong, positive and significant relationship between fair treatment and Organizational Citizenship Behavior ($r = 0.662$ and $p < 0.01$). This indicates that when employees perceive that they are being treated fairly in an organization, they are more inclined to engage in voluntarily productive behaviors such as loyalty, teamwork and initiative. These finding are in support of the organizational justice theory and demonstrate that fair treatment among employees is a key driver of positive workplace attitudes and behavior in higher education institutions.

The results also revealed a positive and significant correlation between career development and OCB ($r = 0.656$ and $p < 0.01$). These results imply that employees who are provided with career development opportunities such as training, mentorship and growth pathways tend to reciprocate with voluntary good behavior that enhances organizational effectiveness. This confirms that investing in employees' personal and professional growth can foster employee's loyalty, motivation and willingness to go beyond prescribed roles.

Finally the strongest relationship observed in this study was between rewards and recognition and OCB ($r = 0.729$ and $p < 0.01$). This implies that when employees are acknowledged and rewarded for their performance and contributions towards the organizations goals both intrinsically and extrinsically, they demonstrate higher levels of OCB. This reflects the principles of reciprocity and social exchange theory whereby recognition and rewards encourage employees to give back to the organization through extra-role behavior.

5.2 Recommendations

The recommends that Institutions of higher learning in Kabale District should develop and implement clear policies and practices that promote fairness in treatment across all levels of staff. This includes ensuring transparent communication, equitable distribution of resources, consistent application of rules and inclusive decision-making processes. By fostering a culture of fairness, institutions can enhance employees' perception of justice which in turn is likely to strengthen Organizational Citizenship Behavior (OCB) such as altruism, conscientiousness and civic virtue. Leadership and human resource departments should regularly assess fairness perceptions through staff feedback and address concerns promptly to maintain a positive and productive organizational climate.

Institutions of higher learning in Kabale District should also prioritize and invest in structured career development programs, such as mentorship, continuous professional training, promotion pathways and performance-based advancement opportunities. Enhancing employees' access to career growth not only improves job satisfaction but also fosters a sense of organizational commitment and belonging. This, in turn, promotes Organizational Citizenship Behavior (OCB), including voluntary efforts that go beyond formal job requirements. Management should integrate career development into strategic human resource planning to cultivate a motivated workforce that actively contributes to institutional success and cohesion.

Finally, institutions of higher learning in Kabale District should implement comprehensive reward and recognition systems that value both formal achievements and informal contributions by employees. These systems should include both monetary rewards (bonuses, salary increases) and non-monetary recognitions (public acknowledgement, certificates of appreciation, employee of the month programs). When employees believe their efforts are appreciated and fairly rewarded, they are more likely to exhibit Organizational Citizenship Behaviour (OCB), such as assisting colleagues, taking initiative, and demonstrating loyalty to the institution. Regular and transparent recognition of employees' efforts can significantly improve morale, engagement, and institutional performance.

REFERENCES

AbuKhalifeh, A. A. N., & Som, A. P. M. (2013). The antecedents affecting employee engagement and organizational performance. *Asian Social Science, 9*(7), 41–54.

Alkahtani, A. (2015). Organizational citizenship behavior (OCB) and rewards. *International Business Research, 8*(4), 210–219.

Asadullah, M., Azam, K., & Hussain, M. (2021). Moderating role of leaders' emotional intelligence in job characteristics and employees' organizational citizenship behavior relationship: Evidence from construction sector of Pakistan. *Journal of Business & Tourism, 6*(1), 19–30. https://doi.org/10.34260/jbt.v6i1.178

Aspinall, R., & McLaughlin, J. (2019). The Ministry of Education, Culture, Sports, Science and Technology. In *Handbook of Japanese Public Administration and Bureaucracy* (p. 305).

Bateman, T. S., & Organ, D. W. (1983). Job satisfaction and the good soldier: The relationship between affect and employee "citizenship." *Academy of Management Journal, 26*(4), 587–595.

Batool, B. F. (2013). An empirical study on effect of transformational leadership on organizational commitment in the banking sector of Pakistan. *IOSR Journal of Business and Management, 8*(2), 38–44.

Licensed Under Creative Commons Attribution (CC BY-NC)

Blau, P. M. (1964). Justice in social exchange. *Sociological Inquiry, 34*(2), 193–195. https://doi.org/10.1111/j.1475-682X.1964.tb00583.x

Bogler, R., & Somech, A. (2004). Influence of teacher empowerment on teachers' organizational commitment, professional commitment and organizational citizenship behavior in schools. *Teaching and Teacher Education, 20*(3), 277–289.

Chhetri, P. (2014). The role of cognitive and affective trust in the relationship between organizational justice and organizational citizenship behavior: A conceptual framework. *Business: Theory and Practice, 15*(2), 170–178.

Creswell, J. W., & Plano Clark, V. L. (2023). Revisiting mixed methods research designs twenty years later. *Handbook of Mixed Methods Research Designs, 1*(1), 21–36.

Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management, 31*(6), 874–900.

Deww, Z. (2011). Organizational citizenship behavior. *PSYCH761 White Paper (OCB)*, 4629332.

DiPaola, M. F., & Hoy, W. K. (2005). Organizational citizenship of faculty and achievement of high school students. *The High School Journal, 88*(3), 35–44.

Ehtesham, U. M., Muhammad, T. M., & Muhammad, S. A. (2011). Relationship between organizational culture and performance management practices: A case of university in Pakistan. *Journal of Competitiveness, 4*(3), 78–86.

Eisenberger, R., Rhoades Shanock, L., & Wen, X. (2020). Perceived organizational support: Why caring about employees counts. *Annual Review of Organizational Psychology and Organizational Behavior, 7*(1), 101–124.

Gergen, K. J. (1975). Social exchange theory in the use and abuse of social science: Behavioral research and policy making (1st ed., p. 91). Routledge.

Gharagheieh, S. S., & Shokri, S. (2014). The relation of corporate social responsibility with organizational justice and organizational citizenship behavior. *Asian Journal of Research in Social Sciences and Humanities, 4*(3), 438–450.

Güven, B. (2018). A research on determination of the relationship between organizational support and organizational citizenship behavior. *Business & Management Studies: An International Journal, 6*(3), 615–632. https://doi.org/10.15295/bmij.v6i3.304

Hidayat, R., Panjaitan, S., & Hayi, A. (2022). The influence of leadership style, work motivation and work discipline on employee performance at the Sukaindah Village Office, Sukakarya District, Bekasi Regency. *Journal of Dimensions, 11*(1), 54–72. https://doi.org/10.33373/dms.v11i1.3418

Ibrahim, B., Nassar, N., & Soliman, D. (2021). The effect of intrinsic rewards on organizational citizenship behavior: Applied to tourism companies in Egypt. *Egyptian Journal of Tourism Studies, 20*(2), 25–40.

Kothari, C., & Garg, G. (2014). *Research methods: Methods and techniques*. New Age International (P) Limited.

Lidinnillah, F., Murni, S., & Madhakomala, R. (2019). The effect of reward on organizational citizenship behavior (OCB) lecturers of Muria Kudus University (UMK) Kudus Central Java. In *International Conference on Cultural Studies* (Vol. 2, pp. 291–295).

Manansal, R., Sepang, J. L., & Baramuli, D. N. (2016). Pengaruh disiplin kerja dan pengembangan karir terhadap kinerja karyawan pada Fakultas Ekonomi dan Bisnis UNSRAT di Manado. *Jurnal Berkala Ilmiah Efisiensi, 16*(1), 760–770.

Moorman, R. H. (1991). Relationship between organizational justice and organizational citizenship behaviors: Do fairness perceptions influence employee citizenship? *Journal of Applied Psychology, 76*(6), 845–867.

Musgrove, F. C., Ellinger, A. E., & Ellinger, D. A. (2014). Examining the influence of strategic profit emphases on employee engagement and service climate. *Journal of Workplace Learning, 26*(3/4), 152–171.

Najafi, S., Noruzy, A., Azar, H. K., Nazari-Shirkouhi, S., & Dalvand, M. R. (2011). Investigating the relationship between organizational justice, psychological empowerment, job satisfaction, organizational commitment and organizational citizenship behavior: An empirical model. *African Journal of Business Management, 5*(13), 5241–5248. https://doi.org/10.5897/AJBM10.1505

Nikhil, S., & Arthi, J. (2019). Impact of perceived organizational support on citizenship behavior of ITES employees. *Asian Journal of Managerial Science, 8*(3), 24–29. https://doi.org/10.51983/ajm2019.8.3.2705

Ocampo, L., Cedilla, V., Bacunador, A. M., Balo, C. C., Lagdameo, Y. J., & Tupa, N. S. (2018). A historical review of the development of organizational citizenship behavior (OCB) and its implications for the twenty-first century. *Personnel Review, 47*(4), 821–862. https://doi.org/10.1108/PR-04-2017-0136

Podsakoff, M. P., Mackenzie, S. B., Moorman, R. H., & Fitter, R. (2009). Transformational leader behaviours and their followers' trust in leader, satisfaction and OCB. *Leadership Quarterly, 1*(2), 107–142.

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2016). Recommendations for creating better concept definitions in the organizational, behavioral, and social sciences. *Organizational Research Methods, 19*(2), 159–203.

Priyanka, S., & Sripirabaa, B. (2016). Assessing the impact of organizational citizenship behaviour on intention to stay among bank employees in Coimbatore District. *Indian Journal of Research, 5*(4), 140–144.

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Rhoades, L., & Eisenberger, R. (2002). Perceived organizational support: A review of the literature. *Journal of Applied Psychology, 87*(4), 698–741.

Tagulwa, E. A., Owino, P., Muwonge, F., & Kaahwa, M. G. (2023). Students' and employers' perceptions of employability skills in Uganda. *International Journal of Multidisciplinary: Applied Business and Education Research, 4*(6), 2038–2044.

Tumwine, P. (2024). An exploration of how education stakeholders perceive the implications of grade repetition in secondary education in Western Uganda: A qualitative multiple-case study (Doctoral dissertation, University of the Incarnate Word).

Worku, M. A., & Debela, K. L. (2024). A systematic literature review on organizational citizenship behavior: Conceptualization, antecedents, and future research directions. *Cogent Business & Management, 11*(1), 1–19. https://doi.org/10.1080/23311975.2023.2350804

Zhao, X., Yang, Y. C., Han, G., & Zhang, Q. (2022). The impact of positive verbal rewards on organizational citizenship behavior—The mediating role of psychological ownership and affective commitment. *Frontiers in Psychology, 13*, 1–12. https://doi.org/10.3389/fpsyg.2022.864078

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Promoting decent work for sanitation workers through digitalization innovation in cleaning technologies in Tanzania: A case of selected higher learning institutions in Dar es Salaam

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ABSTRACT

This study explores how digitalisation and innovation in cleaning technology can promote decent work for sanitation workers in Tanzania using selected Higher Learning Institutions (HLIs) in Dar es Salaam. In Tanzania, sanitation workers are a marginalised group, with no or minimal trade union representation and little or no technological deployment in the cleaning industry. The study is conducted by considering the United Nations Sustainable Goals (SDG) 8 and 12, which emphasise decent work and responsible consumption and production, respectively. Furthermore, the study was guided by the psychology of work and sociotechnical systems theories, which entail human behaviours, emotions and attitudes towards the work environment and the interdependent relationship between social and technical components of work, respectively. This study deployed a cross-sectional survey design which integrated qualitative and quantitative approaches. Multi-stage and purposeful sampling were used to select a sample from the targeted sanitation workers, facility managers working in HLIs and TUICO representatives in Dar es Salaam. Whereby, structured, semi-structured, thematically aligned, and digitally designed data collection tools were used. Using a cross-sectional survey approach, we assessed working conditions, identified technological opportunities, and examined systemic constraints and enablers. A sample of 39 sanitation workers, 10 facility managers and 2 TUICO representatives participated in this study. Microsoft Excel and Python's Pandas library were used to analyse data by generating descriptive statistics. Crosstabulation was deployed to find patterns across gender, level of education, employment status and others. The findings reveal precarious deficits in decent work: 67% of workers report irregular pay, 92% find their income insufficient, and 95% lack written contracts. Furthermore, 85% receive no social benefits, and 97% work beyond 8 hours daily without overtime reimbursement. Notwithstanding these conditions, there is strong receptivity to innovation, though adoption remains low due to cost, lack of training, and poor institutional prioritisation. Managers declared budget limitations yet conceded potential gains from mechanised equipment and digital tools. The absence of unionisation and grievance mechanisms intensifies workers' vulnerabilities. Conversely, opportunities exist through policy reforms, inclusive procurement practices, training programmes, and stakeholder collaborations. This study upholds that digitalisation can catalyse decent work, but only when integrated with fair labour practices, technological capacity-building, and institutional accountability. The findings stipulate actionable insights for policy, engineers, academia, and labour advocates working towards transforming informal service employment.

Keywords: Cleaning Technologies, Decent Work, Digitalisation, Higher Learning Institutions, Sanitation Workers

I. INTRODUCTION

Digitalisation and innovation of cleaning technologies can improve sanitation workers' working conditions, contributing to decent work (Sustainable Development Goals [SDG] - 8). Decent work emphasises sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all by 2030 (United Nations, 2025). Decent work involves opportunities that are productive and deliver a fair income, security in the workplace, and social protection for families, as well as better prospects for personal development and social integration (Brill, 2021). It also entails freedom for people to express their concerns, organise, and participate in decisions that affect their lives, and equality of opportunity and treatment.

The 2019 World Employment and Social Outlook (WESO) report showed that around 3.3 billion people employed globally in 2018 had inadequate economic security, material well-being, and equality of opportunity, hence, hard-working conditions. Sub-Saharan Africa is the most vulnerable region in the world, with 70% of its employees experiencing poor working conditions, including limited access to social protection, low earnings, and the absence of job contracts (International Labour Organisation [ILO], 2016).

Sanitation workers are often neglected, despite their invaluable service to many of us (World Bank [WB] et al., 2019). Apart from working in unsafe and risky environments, sanitation workers also face stigma and social discrimination resulting from the nature of their work (ILO & WaterAid, 2019). Despite carrying a disproportionate burden of health risks, common to many workers of the informal economy, sanitation workers rarely have affordable

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and proper access to preventive and remedial health care or social protection (Phillippe et al., 2022). Globally, a few international standards apply to sanitation workers, such as the World Bank Environmental and Social Standards and the International Standards Organisation [ISO] Sanitation Standards.

Moreover, context-specific standards and regulations are lacking in most countries (ILO, 2025). Furthermore, many sanitation workers operate in the informal economy and cannot benefit from any protections that may exist. Evidence of sanitation working conditions in nine countries shows that in Kenya, Burkina Faso, Haiti, and Uganda, sanitation workers belong to the informal sector and are exposed to hazardous gases and biological and chemical agents in septic tanks, sewers, pumping stations, and treatment plants; they are unregulated and work manually (World Bank et al., 2019). In the case of South Africa, some sanitation workers belong to the formal sector, where they are protected by the legal framework. Regarding digitisation and innovation of cleaning technologies, the developed and some developing economies are transitioning from manual cleaning to innovative technologies. For instance, in India, sanitation workers in the formal sector use technological and robotic innovations to replace manual tasks, such as robotic sewer cleaners. In South Africa, emptiers use shovels as well as technological innovations to avoid having workers enter pits (ILO, 2019). Mostly, other countries still use traditional equipment, endangering the lives of sanitation workers.

In Tanzania, reports show that most informal workers in Mainland Tanzania have little or no social protection, low salaries, no social security, and a poor physical working environment (Masanyiwa et al., 2020), limiting efforts in the attainment of SDGs, particularly Goal 8 on decent work and economic growth. Employees in this sector are exposed to occupational accidents, chemical hazards, and dermal & respiratory effects (Nzali et al., 2023). The National Strategy for Growth and Reduction of Poverty (NSGRP or MKUKUTA) identify employment as an important policy and strategic issue in poverty reduction. MKUKUTA sought to create decent job opportunities for the unemployed by creating jobs that are free from appalling working conditions, providing an income that is sufficient to cater to basic social and economic needs, balancing the needs and rights of both workers and employers and providing a commitment to social dialogue. Tanzania has not ratified the Employment Policy Convention of 1964 (No.122). It has, however, formulated a National Employment Policy (2008), which sets out the national strategy for employment promotion. Concerning decent work, Tanzania has ratified several ILO conventions and Protocols that underpin the ILO Declaration on Fundamental Principles and Rights at Work, and which form a cornerstone of the ILO Decent Work Agenda.

Accordingly, and as per the ILO Decent Work framework, the implementation of a decent work agenda should be implemented at a country level through the Country Decent Work Program (DWCP). In response to this, Tanzania developed its first time-bound DWCP for 2006 - 2010 and a second for 2010 - 2016. The two programs outlined several priorities to enhance decent work, such as extending social protection coverage for all, promoting the creation of productive employment, improving compliance with labour standards and rights at work, and strengthening social dialogue mechanisms at the national and sectoral levels (ILO, 2025). The above strategies do not specifically cover sanitary workers under poor working conditions (Nzali et al., 2023). Moreover, the Occupational Safety and Health Authority No. 5, 2003 segregates sanitary workers as it only covers the safety of employees in the formal sector. Overall, the challenges of sanitary workers are multifaceted, ranging from a lack of legal protection, limited skills, and the use of traditional equipment.

This study argues that the use of digitisation and innovation of cleaning technologies may promote the dignity of sanitary workers. Technologies are expected to improve the quality of services, streamline cleaning processes, and, above all, streamline the cleaning business models. Digitalisation facilitates communication to increase the reach in areas that need special attention. Digitalisation improves the overall management of sanitation workers, equipment, financial resources, and client relations. Capacity-building, learning processes, and opportunities are expected to be improved through digitalisation (de Vette & van der Voorden, 2023). Thus, this study focuses on how digitalisation and innovation of cleaning technologies can promote decent work for sanitation workers who mostly belong to the informal sector, which is unregulated and under poor working conditions.

1.1 Statement of the Problem

There have been global efforts to promote decent work for all (ILO, 2025). Additionally, Tanzania has ratified several ILO conventions and protocols to promote decent work. The government of Tanzania has recently made efforts to reform its legal framework (The Employment and Labour Relations Act, 2017 and Social Security Fund, of 2018 to enhance decent work for all workers. Tanzania, like many other developing nations, is increasingly utilising technological devices in various areas, including communication, transportation, finance, and human resources, among others. Documented practices of working conditions among sanitation workers in higher learning institutions are limited. Furthermore, research on the use and uptake of digitalisation in the cleaning industry is limited. Technology is said to help eliminate manual scavenging by providing efficient replacements for manual sanitation workers to promote their dignity (World Bank et al., 2019). Comparatively, there has been an insignificant development in terms of software and equipment that make jobs easier, better and generate value for businesses in the cleaning industry (Aron, 2023). Nevertheless, innovation in cleaning technologies and digitalisation of cleaning equipment seems to be growing very slowly compared with other industries, leading to slower advancements in cleaning practices.

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While there are various work deficits in the cleaning industry, such as legal framing, social security schemes, modern and advanced cleaning equipment and tools, and social dialogue (World Bank et al., 2019), this study focuses on digitalisation and innovation among sanitation workers to promote decent work. The study's findings are significant to help the government and other stakeholders make appropriate interventions in the informal sector by designing and implementing a country's decent work program that addresses decent work deficits on the ground. The study's findings are crucial in developing context-specific operational guidelines for sanitation workers. Furthermore, the study helps in the adoption and use of digital equipment and innovations. Specifically, this study explored the working conditions of sanitation workers, available innovations and technological opportunities for sanitation workers, and examined existing constraints and opportunities for the attainment of decent work for sanitation workers through technologies.

1.2 Research Objective

i. To explore the working conditions of sanitation workers,
ii. To explore available innovation and technological opportunities for sanitation workers, and
iii. To examine existing constraints and opportunities for the attainment of decent work for sanitation workers.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Psychology of Work Theory

The Psychology of Work (PWT) theory explains diverse individuals' work experiences. The theory aims to predict access to decent work based on experiences of marginalisation and discrimination. It is a key factor in determining a person's overall well-being at work (Autin & Duffy, 2020). Blustein argues that most people around the world have no choice but to take whatever work they can find. According to Blustein, there are three aspects of work: it helps us survive, provides social connection, and allows us to pursue self-determination. Together, these aspects contribute to dignity. However, the theory suggests that people will often accept any work regardless of the working conditions. Based on this theory, sanitary workers continue to work in poor environments to maintain a sense of life and livelihood. Therefore, it is wise to develop strategies to enhance their dignity through innovative technologies.

2.1.2 Sociotechnical Systems Theory

On the other hand, the Sociotechnical Systems Theory (STS) examines the interplay between people (the social system) and technology (the technical system) within an organisational context (Okolo et al., 2019). It emphasises that both social and technical aspects must be jointly optimised to achieve effective organisational performance and improve the quality of work life. The key concepts of this theory are joint optimisation, work system design, autonomy and control, meaningful work, and adaptability. This theory can be used in organisational change and innovation, whereby it guides the introduction of new technologies and processes within the organisation to ensure organisational goals while satisfying workers' needs. It can also be applied in designing a work environment that promotes creativity, productivity, and collaboration by making sure that there is a balance between technical tools and social interactions. Moreover, the theory can satisfy the promotion of safety and well-being by designing safety-critical systems where both human and technical factors are considered in preventing accidents and ensuring well-being (Okolo et al., 2019). The theory is central to this study as it promotes innovative technologies for enhancing safe and healthy work systems, thereby promoting decent work among workers, including sanitary workers.

2.2 Empirical Review

The World Health Organisation (WHO) defines sanitation workers as all individuals, employed or not, who are responsible for cleaning, maintaining, operating, or emptying a sanitation technology at any point in the sanitation chain. In the context of this paper, sanitation workers include toilet cleaners, pit or septic tank emptiers, sewer cleaners, and treatment plant operators. Sanitation workers provide a vital public service that is fundamental to achieving the ambitious global target for safely managed sanitation services outlined in SDG 6.2.

2.2.1 Working Conditions of Sanitation Workers

Empirical literature suggests that working conditions for sanitation workers in Tanzania are often poor and hazardous. Sanitation workers provide a critical service to the public and private sectors. They enable these sectors to reach goals and bring about countries' development, and yet they do all these at the cost of their dignity, safety, health, and living conditions (Njee et al., 2022). Studies show that sanitation workers opt to use face masks and gloves just to reduce the impact on their health. Furthermore, some of them wash their Protective Equipment (PPEs) and dry them for the next use. On the other hand, sanitation workers are stigmatised as they are perceived to be dirty, uneducated, or of the lower classes. The poor working conditions include lower salaries, working with no contracts, working without proper training, the use of improper tools, no respect, and having no sanitation workers' association (Nzali, et al., 2023).

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As a result of stigma and harsh working conditions, some have resorted to substance abuse (Njee et al., 2022). Sanitation workers in Tanzania use traditional working tools (shovels, spades, ropes, buckets, hoes, pickaxes, chisels, and ladders), leading to direct contact with faecal sludge (Njee et al., 2022) .

2.2.2 Available Innovation and Technological Opportunities for Sanitation Workers

Since the beginning of the new millennium, there has been a significant increase in digital technologies globally, particularly in Africa. The fourth industrial revolution brings innovations that reinforce one another by bringing machinery that is powered by machine learning, Artificial Intelligence (AI), based on big data, consequently, simplifying work, resulting in global connectivity and economic development (Melia, 2020). Digitalisation in the workplace covers a wide range of digital technologies and applications, such as digital communication and information tools (ICT), robots, and AI. These technologies shape workplaces differently by providing platforms, algorithmic management, and digital surveillance. Most of these technologies change how we operate and move from labour-intensive to more technology-intensive types of work and organisations (Giebel et al., 2024). Technological innovation in cleaning not only cuts down the cost of chemicals, equipment, personnel, and overhead but also provides a healthy and safe working space (Ramos & Melgar, 2022). In intelligent cleaning, cleaning equipment integrates the Fifth Generation of Mobile Network Technology (5G) and provides strong cleaning hardware support. Equipment such as unmanned road sweeping vehicles, medical disinfection robots, cleaning robots such as vacuuming cleaners, home sweeping robots, garbage sorting and recycling systems, and many more are being used to facilitate cleaning (Ji & Huang, 2021). Given the experience of COVID-19 and the probability of others in the future, it raises questions about whether sanitation workers have adequate protection from contact with chemicals or high exposure, considering the nature of their work.

2.2.3 Existing Constraints and Opportunities for the Attainment of Decent Work for Sanitation Workers

Making efforts to promote decent work for all as per SDG 8, including sanitary workers, is crucial to achieving this goal. However, only 47% of the population in urban areas use at least basic sanitation facilities (Hollis, 2020), which suggests that nearly half of the sanitation facilities in urban areas have weak or no pit lining or slab cover, increasing the risks for sanitation workers. Among other strategies for promoting decent work for sanitary workers are digitalisation and innovation of cleaning technologies. Studies in Tanzania reveal that insufficient infrastructure, including Faecal Sludge Treatment Plants (FSTPs) and office space, negatively impacts the dignity of sanitation workers. Manual emptying is still evident. Nevertheless, efforts have been made to improve equipment for manual emptiers by introducing innovative small-scale emptying equipment such as the MAPET, the Vacutug, and the Gulper. However, these technologies have yet to reach scale, and manual emptying practices persist using traditional tools (Phillipe et al., 2022). So, the need to promote new innovative equipment for sanitary workers is envisioned to help promote the dignity of sanitary workers (Tirivayi et al., 2023). It is also questionable whether sanitation workers are facilitated in terms of the use of digitisation and innovative cleaning technologies in making their working environment better and decent. It is with these concerns that this study analysed the work conditions and available opportunities and challenges for sanitation workers to attain decent work using digitalisation and innovative technologies.

III. METHODOLOGY

3.1 Research Design

This study deployed a cross-sectional survey design which integrated qualitative and quantitative approaches. This approach is appropriate for capturing diverse variables at a single point (Pourhoseingholi et al., 2021). The mixed method was used because it allows the triangulation of data to enhance its credibility (Creswell & Hirose, 2019).

3.2 Study Location

This study was conducted in Dar es Salaam. Dar es Salaam City was chosen because it is the main cosmopolitan and commercial centre in Tanzania and one of the fastest-growing cities in Africa. According to the 2022 National Population Census, the City Region had a population of about 5.3 million, an increment of about 23% from the 2012 census. Moreover, the rate of growth of the informal settlements is almost twice the average urban growth rate in the city. Being densely populated with informal settlements, the working conditions of sanitary cleaners are likely to be more hazardous. Moreover, we purposefully selected Dar es Salaam because it is a commercial city with many private cleaning companies offering cleaning services to organisations, including higher learning institutions.

3.3 Study Population and Sample Size

This study targeted sanitation workers (120), facility managers (10) working in HLIs and TUICO representatives (2) in Dar es Salaam. Additionally, the Dar es Salaam Region is the proposed location because it contains a relatively high number of targeted institutions. The region hosts more than a quarter (28%) of the total Higher Learning Institutions (HLIs) (Tanzania Commission for Universities, 2019). Since the sanitation work is not formalised, it was

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not easy to estimate the number of workers in the region. In this regard, respondents were picked in a manner that the data started to repeat itself among respondents. In most cases, more than half of the workers in the targeted institution responded to the study.

3.4 Sampling Techniques

Multi-stage sampling was conducted by identifying HLIs with a good concentration of sanitation workers, and later, a purposeful sampling was used to target institutions by involving respondents who were willing to participate. We had respondents clustered in three groups: 39 sanitation workers (59% female, 41% male), 10 facility managers, and 2 TUICO officials. These respondents were selected based on their relevance to the study objectives. This approach was based on best practices in implementing research where priority is placed on depth and relevance rather than randomisation (Palinkas et al., 2023).

3.5 Data Collection Instruments

The study used three structured and semi-structured, yet thematically aligned, digitally designed questionnaires. These tools were solely tailored for a specific group to capture specific data (Kothari & Garg, 2019). For sanitation workers, the tool collected demographic data, employment status (contract/casual), occupational health and safety, access to training, union affiliation, use of cleaning technologies, digital literacy, and perceptions of decent work. On the other hand, data from facility managers responds to worker conditions, managerial practices, technology adoption, training availability, and institutional constraints. Finally, data collected from TUICO officials answered questions related to labour rights advocacy, unionisation, digital innovation in sanitation, and barriers to achieving decent work.

3.6 Data Analysis Methods

Microsoft Excel and Python's Pandas library were used to analyse data by generating descriptive statistics. Crosstabulation was deployed to find patterns across gender, level of education, employment status and others. Based on the number of respondents, the statistical data are not meant to give a statistical generalisation. On the other hand, qualitative data were coded thematically by following Braun and Clarke's reflexive method, identifying key themes such as "low pay," "lack of protective gear," "delayed wages," "absence of training," and "need for modern tools." This methodology is meant to provide insight into the research objective by providing real-time insight into the working conditions and technological practices in the institutions. The mixed-methods, multi-stakeholder involvement design corresponds with recent labour studies that explore innovation, informality, and workplace equity in developing contexts.

3.7 Ethical Consideration

Informed consent was obtained from all respondents before data collection. Confidentiality and privacy were ensured throughout the research process. Ethical authorisation was sought from the relevant institutional review boards (Tirivayi et al. 2023).

IV. FINDINGS & DISCUSSIONS

4.1 Demographic Profile of Sanitation Workers

This section presents the demographic characteristics of the surveyed sanitation workers, specifically highlighting their gender, age, and education distribution as illustrated in Figure 1.

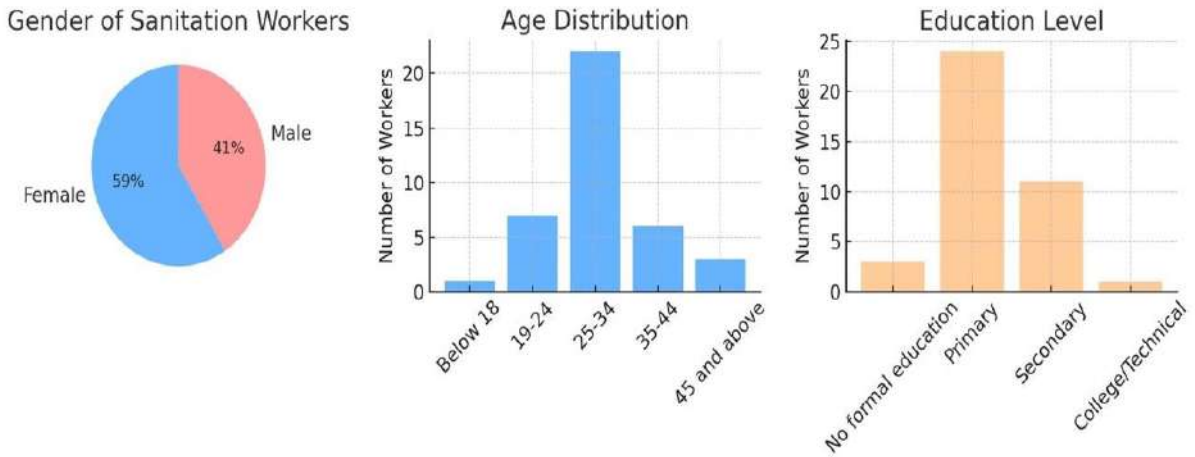

Figure 1

Gender, Age, and Education Distribution of Surveyed Sanitation Workers

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Data shows that out of 39 sanitation workers who responded to this study, 59% were female and 41% were male. Also, when looking at age distribution, the majority of respondents, 56% were between the ages of 25 and 34; otherwise, the other age groups are as presented in the central image. Lastly, when looking at the age distribution of respondents, it was seen that nearly two-thirds (62%) of respondents had a primary school education, and only 28% attained secondary school education, and 3% had college or technical education, as shown in the right-most chart in Figure 1. Other demographic data that were captured show that 95% of workers are casual workers. The only 5% who have contracts are the workers aged between 25 and 34 and have a secondary education.

4.1.1 Working Conditions: Wages, Contracts, and Hours

Figure 2 summarises key indicators of working conditions among sanitation workers, including the regularity of wage payments, the sufficiency of income to meet family needs, and access to social security or health benefits.

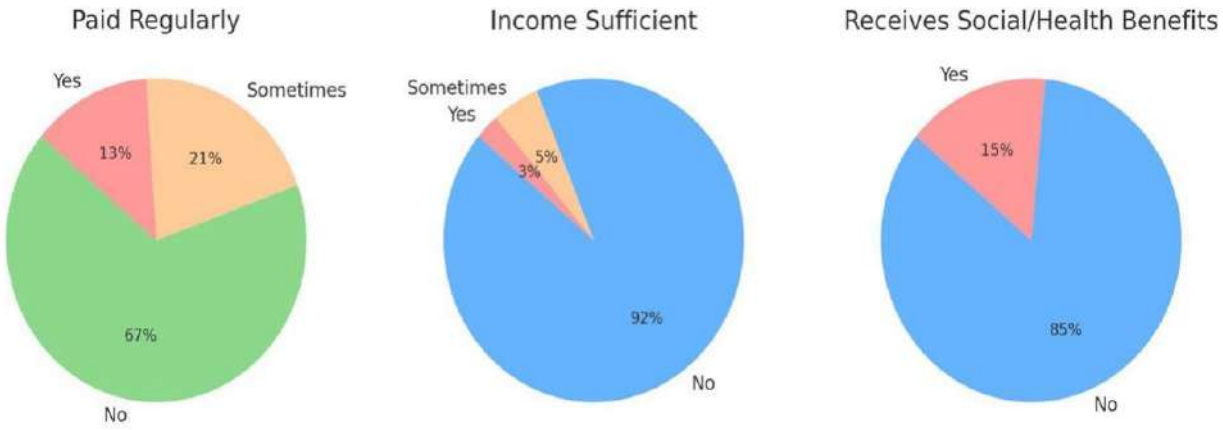

Figure 2

Key Indicators of Working Conditions for Sanitation Workers (worker survey results). Left: Regularity of wage payment; Centre: Sufficiency of Income for Family Needs; Right: Access to any Social Security/Health Benefits

In the working conditions, 67% of respondents reported not receiving regular pay, and only 13% acknowledged being paid regularly. Respondents were also asked if the income is sufficient, and 92% said the income is not sufficient, while only 3% are satisfied with their income. When asked how much they receive, respondents said they receive between TShs 100,000-150,000 (which is equivalent to USD 40-60) per month, which is not enough for urban living. Furthermore, 85% of respondents said they do not receive social and health benefits. On the other hand, 97% of workers said they are not given time to rest, and there are no holidays for them.

4.1.2 Occupational Safety, Health, and Welfare

Figure 3 illustrates key occupational safety and health indicators among sanitation workers, including their access to protective gear, perceptions of workplace safety, and receipt of relevant training.

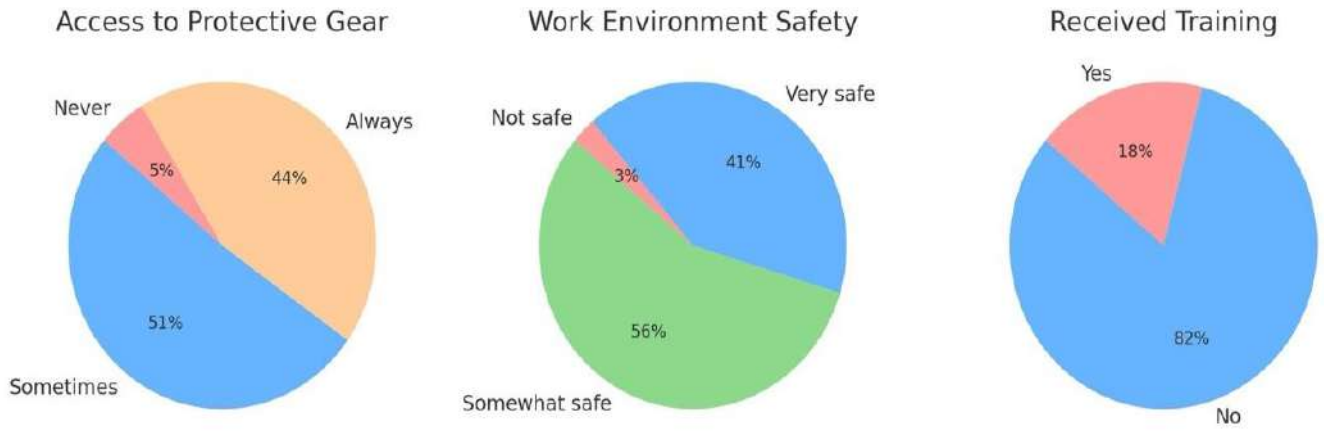

Figure 3

Occupational Safety and Health Indicators for Sanitation Workers. Left: Access to Protective Gear (PPE) like Gloves, Boots, Masks; Middle: Workers' Perception of Safety in their Work Environment; Right: Receipt of any Training Related to Cleaning or Safety Procedures.

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In the occupational safety, health and welfare, 51% of respondents said they sometimes receive protective gear, 44% said they always receive, while 5% have never received protective gear. On the safety side, 56% said they are working in somewhat safe environments, 41% said they are very safe, while 3% are not working in safe environments. Lastly, participants were asked if they received training; 82% of respondents said they do not receive training, and the remaining 18% received training.

4.1.3 Technology and Innovation in Cleaning Work

Figure 4 illustrates sanitation workers' feedback concerning the technical dimensions of their employment, particularly their familiarity with novel cleaning instruments and their accessibility to mobile phones or digital devices for work-related communication.

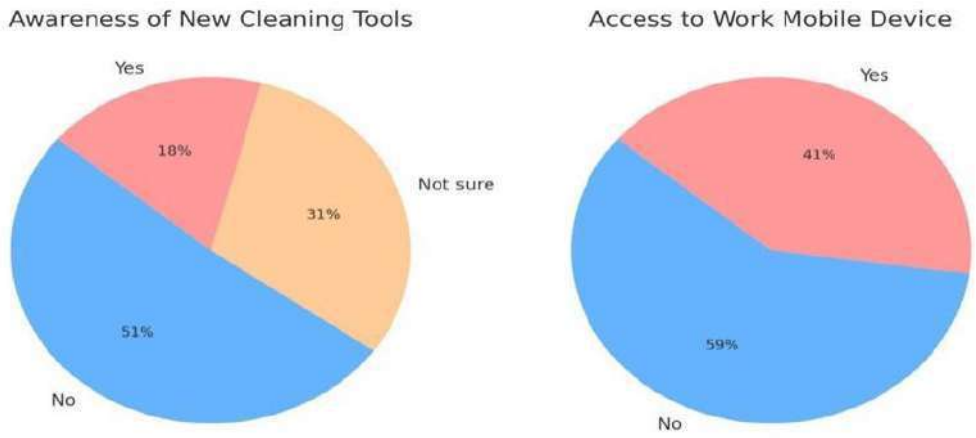

Figure 4

Worker Responses on Technological Aspects. Left: Awareness of any New/Innovative Cleaning Tools being used in their Workplace; Right: Access to a Mobile Phone or Digital Device for Work Communication

Regarding the availability and use of innovations and technological opportunities for sanitation workers, where findings indicate a limited penetration of advanced sanitation tools in HLI, where most cleaning is done manually using basic tools like mops, brushes and brooms. Respondents were asked if they are aware of new cleaning technologies, and data shows that 51% are not aware, 31% were not sure, while only 18% are aware of such technologies. Furthermore, respondents were asked if they have access to mobile devices such as mobile phones or any communication devices for work. 59% said they do not have such devices, while 41% have them.

The cleaning technologies that were expected and given as an example to the respondents included, but were not limited to, vacuum cleaners, mechanical polishers, and UV-C disinfectant and other sophisticated devices and innovations, such as robotic cleaners or IoT-based smart tools, were notably absent. It was further reported that the technologies that are currently in use are decades old and not digitally enabled. Furthermore, mobile devices that were given as an example were mobile phones, which were sometimes used for official communications or applications that are used for information sharing. Respondents said there is nothing like that, but they use their mobile phones for short messaging service (SMS) and calls that are work-related. Despite this limited exposure, workers were highly positive, with 91% of respondents agreeing that modern tools could improve their working environment and their ability to work more efficiently.

4.1.4 Constraints and Opportunities for Decent Work

Lastly, existing constraints and opportunities for the attainment of decent work for sanitation workers were examined. Data shows that 95% of workers are casually employed. 92% of workers said the wages are sometimes delayed and not sufficient for them to live in urban areas. While 85% of workers reported having no access to health insurance, pension or other work-related benefits. About 56% perceived their work as somewhat safe; there are a lot of risks attached to the job that most respondents cannot say because most of them are not provided with modern PPE and do not receive training for their work. Despite all these constraints, 95% of workers said the introduction of digital and/or automated tools would improve their work experience.

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4.2 Discussion

This study aimed to explore how digitalisation and innovation in cleaning technologies could improve the work of sanitation workers in HLIs in Tanzania. Findings show that there is a significant gap in decent work for sanitation workers and point out actionable opportunities for improvement.

4.2.1 Working Conditions of Sanitation Workers

Data shows that 95% of Sanitation workers involved in this study are employed informally, with no formal contracts and work as casual labourers. As classified by the ILO, their experience is similar to what is referred to as *"vulnerable employment*", which is witnessed through poor job security, exposure to occupational risks and low wages. Findings show that sanitation workers have a low education level and have no social protection, which compounds their vulnerability. As per assessment conducted by ILO and WHO in 2019, sanitation workers operate at the cost of their dignity, health, safety and living conditions (Philippe et al. 2022). Findings are also consistent with the Psychology of Work Theory, where people settle for work regardless of working conditions. In comparison to other regions, such as South Africa and India, sanitation workers in Tanzania face similar challenges, but they lack advocating movements like #OutsourcingMustFail, which pushed South African universities to source cleaners from within and improve working conditions (Hamilton, 2017). Because of weak union presence, Tanzania cleaners cannot negotiate or organise improvements. TUICO respondents acknowledged that union structure habitually excludes informal workers and suggested a model like workers' cooperatives or a partnership with NGOs to be innovated to accommodate informal workers.

4.2.2 Digitalisation and Innovation

There is harmony between the manager and workers that technology could improve working conditions significantly. This goes hand in hand with Sociotechnical System Theory, where both technical and social aspects need to be aligned to achieve organisational performance and improve work-life qualities. Automated or mechanised cleaning devices, such as automated waste bins, could reduce health risks and physical trauma. Despite limited exposure, data show that 95% of sanitation workers said modern tools could improve safety and ease tasks at hand. Digitisation, when implemented with workers' safety in mind, can reduce exposure to a hazardous environment (ILO, 2025). Due to budgetary constraints and limited procurement standards, adoption of digitalisation remains minimal. Managers suggested that the inclusion of modern cleaning technologies explicitly depends on the mandates of institutions. Which implies, including innovations and safety standards in the Public Procurement process, such as mechanised tools or provision of PPEs, could be a key policy treadle (Hinkley, 2023). Furthermore, local innovations remain untapped. Universities in Tanzania could work with tech hubs or engineers to forge affordable and context-appropriate cleaning tools (Okolo et al., 2019).

4.2.3 Constraints and Opportunities for Decent Work

Systemic constraints obstruct the path towards decent work for sanitation workers, limited enforcement of labour standards, improper outsourcing models and limited platforms for workers to air their grievances are some of these obstructions. Technology alone cannot ensure safety or fairness if not incorporated with policy reforms and on-the-job training to raise awareness (Hauk et al., 2025). Our findings support this argument, whereby workers emphasised fair pay, safety, and dignity, to mention a few. All these values align with the ILO's Decent Work Agenda. There are opportunities where Public Institutions could lead by example, mandating decent payment and social security for sanitation workers in their tender documents and contracts (Rymarczyk, 2020). Also, institutions can enhance inclusion of sanitation workers and respect by providing them with Identification Cards (IDs), inviting them to staff meetings, providing them with respectable uniforms and more to combat stigma and social exclusion (ILO, 2025). In this study, gender was also a key dimension whereby most of the workers are women, which suggests that working strategies and conditions should address gender specific vulnerabilities, such as harassment risks and maternity protection. Findings generally suggest that current conditions fall short of decent work. Still, there is a strong will among stakeholders to improve the working conditions for sanitation workers, especially if guided by clear policy, innovations and inclusive planning (Hollis, 2020). By connecting digital tools with decent work principles, Tanzania can modernise sanitation labour while promoting dignity and equity (ILO, 2025).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Generally, the study concludes that the livelihood and dignity of sanitation workers in the selected institutions do not align with values stipulated in the ILO Decent Work Agenda. While the adoption of digitalisation in cleaning remains minimal, there is room for improvement by implementing multifaceted recommendations from this report. On the same footing, the study noted that adopted of digital technology alone is not sufficient to safeguard decent work. As

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indicated in the findings, the working environment, social security and unionism for cleaners are highly emphasised. Therefore, the adoption of digital technologies and review of policies that safeguard the working conditions of sanitary workers, organisations can promote the achievement of Sustainable Development Goals 8 (decent work) and 12 (responsible production).

5.2 Recommendations

Since the digitalisation of sanitation works is extremely minimal in the selected HLIs, it is very clear that there should be an institutional and national willingness to adopt innovations that will amount to efficiency and safety in sanitation. To support these innovations, interventions such as training, infrastructure, and policies should all be aligned with this goal. This study pinpointed critical gaps in decent working conditions for sanitation workers in HLIs in Dar es Salaam. Furthermore, the study underscores the role of digital and technological innovations that close the gaps and contribute to decent work as stipulated in SDGs 8 and 12.

The study provides actionable recommendations to improve decent work for the sanitation worker through digitalisation. Among others, the study recommends strengthening of labour regulations and procurement policies, innovation of technologies that are safe, training and capacity building, promoting representation and voices for sanitary workers, and more research, advocacy and stakeholders' collaboration in making sure that there is decent work for sanitation workers.

All these recommendations would be fruitful if responsible government institutions work hand in hand in making sure the existing labour laws, regulations and policies are enforced, compliance with minimum wages, timely payments and enrolment in the social security scheme are observed and worked upon. On the other hand, contractors and institutions should work together in identifying opportunities and areas where the mechanisations and digitalisation will be implemented to improve cleaning working standards. Also, organisations such as OSHA, HLIS and NGOs should design and deliver training and awareness programs that upskill both technical and digital skills and later improve working conditions, and provide awareness about rights, obligations and standards of players in the working environments. Moreover, all parties, Institutions and contractors should work together in ensuring that workers are registered and have their representations in trade unions and have advocating groups that will act as platforms to air their grievances freely and privately. Finally, more research needs to be conducted on sanitation work dynamics and other related issues that are impactful to sanitation work.

REFERENCES

Aron, D. M. (2023). The clean world of dirty work: Actors, technology, social relations. *Open Journal of Social Sciences*, *11*(11), 329–344. https://doi.org/10.4236/jss.2023.1111021

Autin, K. L., & Duffy, R. D. (2020). The psychology of working: Framework and theory. In H. N. Perera (Ed.), *International handbook of career guidance* (pp. 167–184). Springer. https://doi.org/10.1007/978-3-030-25153-6_10

Brill, L. (2021). What is decent work? A review of the literature. In F. Christie, M. Antoniadou, K. Albertson, & M. Crowder (Eds.), *Decent work: Opportunities and challenges* (pp. 11–26). Emerald Publishing. https://doi.org/10.1108/978-1-80117-586-920211002

Creswell, J. W., & Hirose, M. (2019). Mixed methods and survey research in family medicine and community health. *Family Medicine and Community Health, 7*(2), e000086. https://doi.org/10.1136/fmch-2018-000086

de Vette, K., & van der Voorden, C. (2023). Addressing the human resource capacity gaps in rural sanitation and hygiene: Final report. USAID Water, Sanitation, and Hygiene Partnerships and Learning for Sustainability (WASHPaLS) #2. https://www.susana.org/knowledge-hub/resources?id=5277

Giebel, R., Geyer, J., & Dauth, W. (2024). The impact of a new workplace technology on employees. *Oxford Bulletin of Economics and Statistics, 86*(2), 243–268. https://doi.org/10.1111/obes.12642

Hamilton, R. (2017). #OutsourcingMustFall in Tshwane. *Journal of Southern African Studies, 43*(2), 175–191.

Hauk, N., Soni, M. M., & Kalkan, Y. (2025). The impact of digitalisation and information and communication technology on the nature and organisation of work and the emerging challenges for occupational safety and health. *International Journal of Environmental Research and Public Health*, *22*(3), 362. https://doi.org/10.3390/ijerph22030362

Hinkley, S. (2023, January 10). Technology in the public sector and the future of government work. UC Berkeley Labor Center. https://laborcenter.berkeley.edu/technology-in-the-public-sector-and-the-future-of-government-work/

Hollis, R. K. (2020). Exploring perceptions of household surface cleaning products and the implications for sustainable consumption [Doctoral dissertation, University of Leeds]. White Rose eTheses Online. https://etheses.whiterose.ac.uk/28111/

International Labour Organization, & WaterAid. (2019). *Guaranteeing the rights of sanitation workers: Links between SDG 8 and SDG 6: Policy brief for the 2019 High-Level Political Forum.* WaterAid.

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https://washmatters.wateraid.org/sites/g/files/jkxoof256/files/guaranteeing-the-rights-of-sanitation-workers-links-between-sdg-8-and-sdg-6.pdf

International Labour Organization, Country Office for Tanzania, Kenya, Uganda, Rwanda and Burundi. (2016). *Making decent work a reality in Tanzania: July 2011–June 2016*. International Labour Organization. https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@africa/@ro-abidjan/@ilo-dar_es_salaam/documents/publication/wcms_541912.pdf

International Labour Organization. (2025). *Revolutionising health and safety: The role of AI and digitalisation at work*. https://www.ilo.org/sites/default/files/2025-04/ILO_Safeday25_Report_EN_r8%2B%281%29.pdf

Ji, H., & Huang, H. (2021). The integration and development trend of China's 5G technology and smart cleaning. *Journal of Physics: Conference Series, 1812*(1), 012015. https://doi.org/10.1088/1742-6596/1812/1/012015

Kothari, C. R., & Garg, G. (2019). *Research methodology: Methods and techniques* (4th ed.). New Age International.

Masanyiwa, Z., Mosha, E., & Mamboya, S. (2020). Factors influencing participation of informal sector workers in formal social security schemes in Dodoma City, Tanzania. *Open Journal of Social Sciences, 8*(6), 229–242.

Melia, E. (2020). African jobs in the digital era: Export options with a focus on online labour (Discussion Paper No. 3/2020). German Institute of Development and Sustainability. https://doi.org/10.23661/dp3.2020

Njee, R., Allute, S., & Selemani, A. (2022). Assessment of the health, safety and dignity of sanitation workers in Dar es Salaam, Dodoma and Arusha, Tanzania. WaterAid. https://washmatters.wateraid.org/sites/g/files/jkxoof256/files/assessment-of-the-health-safety-and-dignity-of-sanitation-workers-in-tanzania.pdf

Nzali, A., Phillipo, F., Msomba, G., Ruheza, S., Pesha, J., & Msambila, A. (2023). Short report on the situation and context of sanitation workers in Tanzania. University of Iringa. https://doi.org/10.2139/ssrn.4365650

Okolo, D., Kamarudin, S., & Ahmad, U. N. (2019). Employing the Sociotechnical System Theory of Job Design for Technostress Intervention: An integration of technological and social job characteristics. *Change Management: An International Journal, 19*(1), 11–23. https://doi.org/10.18848/2327-798X/CGP/v19i01/11-23

Palinkas, L. A., Zatzick, D., & Hoagwood, K. (2023). Purposeful sampling for implementation research. *Implementation Research and Practice, 4*, 1–9. https://doi.org/10.1177/26334895231168372

Philippe, S., Hueso, A., Kafuria, G., Sow, J., Kambou, H. B., Akosu, W., & Beensi, L. (2022). Challenges facing sanitation workers in Africa: A four-country study. *Water, 14*(22), 3733. https://doi.org/10.3390/w14223733

Pourhoseingholi, M. A., Vahedi, M., & Rahimzadeh, M. (2021). Study design in medical research. *Gastroenterology and Hepatology from Bed to Bench, 14*(1), 1–4. https://doi.org/10.22037/ghfbb.v14i1.1949

Ramos, M., & Melgar, J. (2022). Technological innovation and sustainability in the cleaning industry: Benefits, barriers, and future trends. *Sustainability, 14*(18), 11488. https://doi.org/10.3390/su141811488

Rymarczyk, J. (2020). Technologies, opportunities and challenges of the Industrial Revolution 4.0: Theoretical considerations. *Entrepreneurial Business and Economics Review, 8*(1), 185–198.

Tanzania Commission for Universities. (2019). *The state of higher education 2019*. Ministry of Education, Science and Technology.

Tirivayi, N., Musindo, T., & Peterman, A. (2023). Ethics in field research in low-income countries: Recommendations for best practice. *Development Policy Review, 41*(2), e12592. https://doi.org/10.1111/dpr.12592

United Nations. (2025). Goal 8: Economic growth. *Sustainable Development Goals*. https://www.un.org/sustainabledevelopment/economic-growth/

World Bank, International Labour Organization, WaterAid, & World Health Organization. (2019). *Health, safety and dignity of sanitation workers: An initial assessment*. World Bank. https://www.wsp.org/sites/wsp/files/2019-10/Health-Safety-Dignity-Sanitation-Workers.pdf

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Effect of women economic empowerment on socio-economic development of Kabale Municipality, Uganda

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ABSTRACT

Women's economic empowerment has become a foundation for development strategies, and it has increasingly been recognised for its important role in the socio-economic development of many countries. This study examined the effect of women's economic empowerment on socio-economic development in Kabale Municipality, Uganda. The study was anchored on Sen's Capability Approach theory and the Human Development Theory. A cross-sectional survey design employing a quantitative approach was adopted to evaluate relationships between the study variables at a single point in time. A sample of 153 respondents was selected from a total population of 203 using the stratified random sampling technique. Primary data was collected using structured questionnaires and analysed using descriptive and regression statistics on SPSS Version 25.0. Quantitative findings presented through descriptive statistics and regressions revealed that women's economic empowerment positively affects socio-economic development ($R^2 = 0.763$ and $p = 0.000 \leq 0.005$). The study concluded that economic empowerment of women positively and significantly contributes to socio-economic development in Kabale Municipality. Finally, the study recommended that efforts to empower women across the economic dimensions be prioritised to enhance socio-economic growth in the region.

Keywords: Socio-Economic Development, Kabale Municipality, Women Economic Empowerment, Uganda

I. INTRODUCTION

Socio-economic development is a concept recognized globally and has since been associated with investments in things like good education, better health, infrastructural development and good governance practices (Gumede, 2022). According to Jaquette (2017), women economic empowerment gained structured recognition in the mid to late 20th century and since then it has played a significant role in achieving sustainable socio-economic development in many countries across the world most especially in the developed nations. The first world conference on women empowerment that took place in 1975 in Mexico City where women across the globe were officially empowered and placed at the center stage of the development agenda worldwide marked the turning point of most countries equitable development agenda and women involvement in socio-economic development activities (Fraser & Tinker, 2004). Then followed the subsequent global frameworks and inclusive policies such as the Beijing Declaration and Platform for Action in 1995 and the Sustainable Development Goals (SDG) with SDG 5 focusing on gender equality. All these initiatives have since emphasized that empowering women economically is very essential for achieving inclusive economic growth, poverty reduction and social cohesion. Statistical data from most developed and developing countries confirms that when women have access to capital, skills training and decision making opportunities, their household incomes improve, child welfare increases and national economies become more developed and resilient (Banerjee et al., 2020).

In the Africa context, the relationship between women economic empowerment and socio-economic development has evolved overtime alongside shifts in governance, policy and civil society engagement (Chikwe et al., 2024). In many African countries the post-independence periods saw women increasingly organized through women groups, cooperatives and movements advocating for women's economic inclusion and empowerment (Bauer et al., 2017). Governments started recognizing the important role that women play in national development leading to the initiation of programs promoting adult literacy, maternal health care and income generating activities for women. The African Union's Agenda 2063 and the Maputo Protocol that basically advocates for protects the civil, political, economic and cultural rights of women and girl child in Africa have equally reinforced the continent's commitment to gender equality as a pathway to sustainable development. However, challenges such as male dominated African societies leading to patriarchal norms, limited access to credit for women and low levels of political representation for women

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have continued to constrain women's full potential and participation in economic development in most African countries (Milazzo & Goldstein, 2019).

In the Ugandan context, economically empowering women has been recognized as an important and strategic tool for national development as stipulated in Uganda's Vision 2040 and the National Gender Policy (Tizikara et al., 2019). The government of Uganda has introduced several initiatives that aim to improve women's access to financial resources, skills training and leadership platforms such as the Uganda Women Entrepreneurship Programme (UWEP), the Women Development Funds and the NGO-led microcredit schemes which have proven to be very productive in national development. These programs have generally led to visible improvements in household incomes, increased girl-child education and health awareness especially in urban and semi-urban areas, however limitations such as weak program monitoring, limited reach and cultural barriers have continued to challenge their overall sustainability and impact on socio-economic development.

At the local level, Kabale Municipality has continued to experience increased engagement in women empowerment initiatives and programs largely through savings and credit groups, SACCOs, church based development efforts and the extension of UWEP at the local level and all these programs have continuously provided women with opportunities for entrepreneurship, access to capital funds and skills development. While some women have reported improved household income and decision making power, others still face barriers such as limited startup capital, low awareness of support program availability and deep rooted gender roles that continue to suppress their potential as women (Coulter et al., 2019). In Kabale Municipality he socio-economic development landscape remains largely uneven with pockets of progress largely concentrated among the elite women who have actively participated in empowerment programs (Christopher, 2021). There is however limited empirical evidence assessing the extent to which these programs have contributed to broader social and economic transformation thereby justifying this study.

1.1 Statement of the Problem

Economically empowered women are central to economic growth as they contribute to household incomes, improve community health, support education initiatives and enhance good governance practices (Brody et al., 2015). In Uganda, the Vision 2040 and the National Development Plan III 2020 emphasize on the need for inclusive economic transformation in municipalities like Kabale emphasizing and promoting equal access to opportunities for all citizens especially women (Balyejjusa, 2015). Despite all these significant investments in women empowerment efforts across Uganda including skills development, access to finance, reproductive health services and leadership opportunities, the actual contribution of these programs and efforts to socio economic development in Kabale Municipality remains unclear. In essence, key development indicators reveal persistent gender disparities where women continue to face challenges such as limited access to formal employment, constant financial exclusion, low literacy levels and underrepresentation in decision making arenas (Agaba, 2024). Reliable data from the Uganda Bureau of Statistics (UBOS, 2019) reveals that over 67% of youth and women are trapped in informal employment sectors with little or no social protection. At the same time, socio-environmental problems like the degradation of wetlands reported by National Environment Management Authority-NEMA (2023) threaten livelihoods and limit access to essential services, disproportionately affecting women who depend on agriculture and small-scale trade. While infrastructural development efforts have visibly improved public amenities, they have not necessarily translated into equitable socio economic gains for women in the municipality. Moreover, national level studies often fail to capture the unique economic and cultural context of semi urban regions like Kabale leading to a critical research gap. Without empirical evidence connecting women's economic empowerment to tangible socio-economic outcomes at the local level, policies may remain generalized, ineffective or misaligned with actual needs. Therefore, this study sought to examine the relationship between women economic empowerment and socio-economic development in Kabale Municipality.

1.2 Research Objectives

To examine the effect of women economic empowerment on socio-economic development in Kabale municipality, Uganda

1.3 Research hypothesis

H_{01}**:** There is no significant effect of women's economic empowerment on socio-economic development in Kabale Municipality, Uganda.

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II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Sen's Capability Approach

Developed by Amartya Sen in 1999, the Capability Approach shifts the focus of development from economic indicators to individuals' capabilities the real freedoms they enjoy to live the lives they value. The theory assumes that development must enhance people's abilities to make choices and convert resources into meaningful outcomes such as education, health and employment (Alkire & Deneulin, 2009). This theory is relevant to the current study as it conceptualizes women empowerment not just as access to resources but as expanding women's freedoms and real opportunities. In Kabale Municipality, understanding how empowered women can exercise agency over their lives, participate in income-generating activities and make household decisions aligns directly with the capability approach. For instance, programs that improve women's access to credit, education or skills training must also be evaluated in terms of whether they translate into actual changes in women's agency and well-being.

2.1.2 Human Development Theory

The Human Development Theory as popularized by the United Nations Development Programme posits that development should enlarge people's choices and improve their well-being, not just increasing economic output. The theory assumes that health, education and decent standards of living are the core dimensions of development (Welzel et al., 2003). The theory supports the idea that empowering women contributes directly to human development by improving household health, education outcomes and income levels. Therefore, empowered women can enhance the overall wellbeing of their families and communities by participating in decision making and economic activities.

2.2 Conceptual Review

2.2.1 Women Economic Empowerment

Women economic empowerment programs are structured initiatives designed to enhance women's capacity to make life-determining decisions, access resources and participate meaningfully in economic, social, political and health related activities (Brody et al., 2015). Empowerment involves the expansion of people's ability to make strategic life choices in contexts where this ability was previously denied to them. In the context of women, such programs may involve skills training, access to microcredit, leadership development, legal awareness and health education. Nabi and Yasmin (2025) categorized women empowerment into six dimensions namely: economic, interpersonal, legal, political, psychological and socio-cultural. In Kabale Municipality, women economic empowerment programs often focus on economic initiatives like SACCOs and vocational training; however, aspects like political voice, reproductive autonomy and access to justice are less frequently addressed. This limited focus suggests that current economic empowerment interventions may not be holistically advancing women's well-being which could limit their impact on broader development outcomes.

2.2.2 Socio-Economic Development

Socio-economic development refers to improvements in the quality of life and economic well-being of a community or region (Gumede, 2022). It encompasses factors such as income growth, improved access to education and healthcare, employment opportunities, infrastructure and reduction in poverty and inequality. Todaro and Smith (2009) describes development as a multi-dimensional process involving major changes in social structures, popular attitudes and national institutions along with the acceleration of economic growth and reduction of inequality. Studies have shown that socio-economic development is positively influenced when women are empower. Empowered women tend to reinvest in their families and communities leading to improved health, education and income outcomes (Chompa, 2022). In Kabale Municipality, while development indicators have shown some progress, gaps remain particularly in female education retention, maternal health and gender responsive governance. The lack of comprehensive empowerment programming targeting these domains may contribute to persistent underdevelopment among women and their households.

2.2 Empirical Review

2.2.1 Women's Economic Empowerment and Social Economic Development

Women economic empowerment fundamentally involves reducing discrimination against women in areas such as education and labor markets creating positive feedback loops between empowerment and development. Notably, some empowerment policies extend beyond equality deliberately targeting resources toward women. For example, family cash transfer programs like Mexico's Portunidae's distributed benefits primarily to mothers rather than fathers. In 2008, the World Bank dedicated $100 million in credit lines exclusively for female entrepreneurs. Currently, most microcredit programs globally prioritize women as their primary beneficiaries (Bandiera et al., 2020). While these

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measures address existing inequities such as women's limited access to financial markets, they are also based on the premise that investing in women yields substantial economic returns. Furthermore, economic empowerment enables women to challenge traditional gender roles enhancing their decision making power within households and communities. Studies by (Chant, 2016) noted that economically empowered women are more likely to participate in community leadership and local governance which contributes to improved social cohesion and development outcomes. Furthermore, Aizer (2010) provided empirical evidence that women's economic empowerment reduces domestic violence which positively affects family stability and economic productivity.

Several studies have found strong evidence that women economic empowerment positively influences socio-economic development. For instance Alemu et al., (2022) conducted a study in Ethiopia to determine how women participation in income generating activities affected poverty reduction in Ethiopia. The study's results revealed that women's involvement in income generating activities is strongly correlated with poverty reduction which eventually leads to improved living standards. Additionally, (Duflo, 2012) empirically analyzed women empowerment and its effect on economic development and his findings emphasized that microfinance and inclusion initiatives for women generated broader benefits such as improved education and health outcomes for families leading to economic development. studies by (Goldin, 2024) about the Impact of Women's Empowerment on Human Capital of the Next Generation Looking within the Household reveal that when women are economically empowered tend to invest more in their children's education and health resulting in intergenerational improvements in human capital. Additionally, Klasen and Lamanna (2009) also conducted a study on the impact of gender inequality in education and employment on economic growth from several African countries and found out that a strong positive link exists between women's economic participation and overall economic growth at the national level. Their research highlighted that increasing female labor force participation reduces poverty and accelerates socio-economic development. Similarly, (Seguino, 2020) in his study on engendering macroeconomic theory and policy argued that empowering women economically helps in closing gender wage gaps and fostering more inclusive economic policies, further driving socio economic development.

Despite these encouraging findings, several scholars caution against overestimating the benefits of economic empowerment without considering structural inequalities. According to Folbre (2014), a feminist critique of the care economy argued that economic empowerment programs often ignore deeply entrenched patriarchal norms that limit women's ability to fully capitalize on economic opportunities which means that women remain marginalized and their efforts unrecognized. Razavi (2021) in his feminist economics handbook on sustainable development goals reflecting on feminist economics perspective emphasized that even when women control income, cultural and institutional barriers usually prevent these gains from translating into broader community development hindering economic growth. Additionally, Cornwall (2016) warned that focusing solely on economic empowerment risks individualizing development challenges and overlooking the need for systemic social change. Some studies also highlight unintended negative effects of economic empowerment initiatives. For instance Jackson (2019) in his study on the post-growth challenge that focused on secular stagnation, inequalities and the limits to economic growth revealed that some microfinance programs increased women's debt burdens overwhelming them economically without necessarily leading to improved economic status and that sometimes intensifying household tensions. Goetz and Gupta (1996) studied gender, power and control over loan use in rural credit programs in Bangladesh and argued that without adequate social support, economic empowerment may increase women's workload and stress without corresponding benefits. And on the other hand Agarwal and Lenka (2016) conducted an exploratory study on the development of women entrepreneurs in Indian and they noted that many women's economic activities remain in the informal sector which is characterized by low pay/income, job insecurity and lack of social protections which limits their contribution to sustainable economic development.

III. METHODOLOGY

3.1 Research Design

A cross-sectional survey design using quantitative approach was adopted. This design allowed for data collection at a single point in time from a sample representing the broader population making it suitable for examining current conditions related to women economic empowerment and its influence on socio-economic development (Shoma, 2019).

3.2 Study Population

The target population comprised of 203 individuals consisting of: 35 politicians, 140 women representatives and 28 staff members of Kabale Municipal Council.

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3.3 Sample Size and Sampling Techniques

The Krejcie and Morgan sample size determination table was used to determine an appropriate sample size for the study which yielded a sample size of 134 respondents. Consequently, stratified random sampling technique was then adopted to determine the respondents in each category.

3.4 Data Collection and Analysis

Primary data was collected using structured questionnaires and data was analyzed using Descriptive statistics including frequencies and percentages. Inferential analysis was also conducted applying Pearson's correlation coefficient and regression analysis using the Statistical Package for Social Sciences (SPSS).

Table 1

Population, Sample size and Sampling Techniques

No	Category	Accessible Population	Sample Size	Sampling Technique
1	Staff of Municipal Council	28	24	Stratified random sampling
2	Politicians	35	27	Stratified random sampling
3	Women Representatives in Kabale municipality	140	103	Stratified random sampling
	Total	**203**	154	

Source: Adopted from Krejci and Morgan (1970) modified by the Researcher

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study distributed a total of 154 questionnaires to respondents and a total of 153 questionnaires were successfully filled and returned representing a high response rate of 99% as indicated in table 2 below.

Table 2

Response rate

Category of Respondents	Population	Sample	Percentages
Staff of Municipal Council	24	24	100%
Local Politicians	27	27	100%
Women Representatives	103	102	99%
Total	**154**	**153**	**99%**

Table 2 indicates a very high response rate of 99% across all respondent categories. This high rate was achieved because the selected respondents were readily available during data collection. According to Amin (2005), a minimum response rate of 70% is considered sufficient to ensure valid research.

4.2 Socio-Demographic Characteristics of the Respondents

The study sort to find out the socio-demographic characteristics of the respondents as presented by their age, gender and level of education.

4.2.1 Age of Respondents

The respondents were categorized into age groups to identify which group has been most active in promoting women's empowerment programs and their impact on socio-economic development in Kabale Municipality, Uganda.

Table 1

Age brackets of respondents

Age Group	Frequency	Percent
21-30 Year	27	17.7
31-40	29	18.9
41-50	46	30.1
51&above	51	33.3
Total	**153**	**100.0**

The results in table 3 above indicated that majority of the respondents 51(33.3%) were aged between 51 years and above, followed by those aged 41 to 50 years at 46 (30.1%). Together, this age group accounted for 63.4% of the

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respondents indicating that majority of the respondents were adults with considerable life experience and could provide relevant information for the study. This age distribution suggested that women empowerment and socio-economic development programs in Kabale Municipality engaged mature individuals who were more likely to hold household decision making power, participate in community leadership and also contribute to sustainable program outcomes. Additionally 29 (18.9%) of the respondents were aged between 31 to 40 years while those in the age bracket of 21 to 30 years accounted for 27 (17.7%) of the total respondents. Cumulatively, this younger age group accounted for 36.6% of the population and it represents the economically active and more vibrant portion of the population with a higher potential for skills development, innovation and long term participation in economic growth. This combination of both mature and younger respondents reflects a multi-generational reach of empowerment programs which ensures both the sustainability of current initiatives through experienced leadership and the future growth of socio-economic activities through youth engagement.

4.2.2 Gender of respondents

The study was also interested in finding out the gender mix of the respondent in order to identify whether both men and women participated in promoting women economic empowerment agendas in Kabale municipality.

Table 2

Gender of respondents

Category of respondents	Frequency	Percent
Male	56	36.6
Female	97	63.4
Total	**153**	**100.0**

The findings on gender of the respondents revealed that 97 (63.4%) of the respondents were female as compared to 56 (36.6%) who were male. This indicates that women comprised the majority of participants. This gender distribution suggests that women's empowerment and socio-economic development programs in Kabale Municipality effectively reached and engaged a substantial portion of women who are typically the main beneficiaries of such initiatives. The higher female representation may be attributed to the fact that women are more directly engaged in community-based projects, micro-enterprises and household income-generating activities in Uganda. It also reflects their willingness to participate in programs that aim to improve livelihoods, access to resources and decision-making power within the community. The male participation rate of 36.6% demonstrates that men are also involved in socio-economic development activities which is essential for fostering inclusive growth and reducing gender disparities. Men's involvement can enhance collaboration, reduce resistance to change and support the sustainability of empowerment programs by promoting shared responsibility between genders. Thus, the gender composition reflects positively on the inclusivity of empowerment initiatives in Kabale Municipality while also highlighting the central role of women as both beneficiaries and drivers of community transformation.

4.2.3 Level of Education of Respondents

The respondents were further categorized into education level groups to identify their highest level of education. This was meant to determine whether the respondents had the capacity to understand the subject matter in the study and to provide relevant information.

Table 3

Level of Education

	Frequency	Percent
Primary	34	22.2
Secondary	69	45.1
Tertiary	50	32.7
Total	**153**	**100.0**

The results show that the majority of the respondents 69 (45.1%) had attained secondary education, followed by 50 (32.7%) who had tertiary education and finally those with primary education at 34 (22.2%). This distribution indicates that majority of respondents possess at least secondary level education which provides a reasonable foundation for engaging in socio-economic development activities. The sizeable proportion with tertiary education suggests the presence of individuals with advanced skills and professional training which can enhance the effectiveness and sustainability of empowerment programs in Kabale Municipality. However, the 22.2% of respondents with only primary education points to a segment of the population that may require additional literacy and vocational skills development

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to fully benefit from socio-economic initiatives. In the context of women empowerment, improving educational access and lifelong learning opportunities for this group would be crucial for enhancing their participation in decision-making, income generation and overall community development.

4.3 Descriptive results

4.3.1 Women Economic Empowerment and Socio Economic Development

The objective of the study was to examine the effect of women economic empowerment on socio economic development in Kabale municipality, Uganda. The opinions of the respondents were sort covering the various measures of women economic empowerment and socio economic development as presented in table 6 and 7 below.

Table 6

Analysis of the descriptive results on Women Economic Empowerment

Women Economic Empowerment	Agree		Undecided		Disagree	
	F	%	F	%	F	%
Women in my community have access and control to land or property	150	98.1%	00	00%	3	1.9%
Women in my community have access to financial services such as loans or savings.	148	96.7%	00	00%	5	3.3%
Women in my community are able to make decisions about how to use their income.	149	97.4%	00	00%	4	2.6%
Women own or co-own business or income-generating activities	145	94.8%	00	00%	8	5.2%
Women can access training or education to improve their economic status.	153	100%	00	00%	00	00%

The respondents were asked whether women have access to land or property and a significant majority of 150 (98.1%) agreed that indeed women have access and control over land and property, while only a few 3 (1.9%) disagreed. This high ownership/control rate is critical for economic security, agricultural productivity and long-term wealth creation, especially for women who often face traditional barriers to land rights in Uganda. When asked if women have access to financial services: 148 (96.7%) of the respondents agreed that women have access to financial services such as loans or savings, with only 5 (3.3%) disagreeing to this statement. This suggests that financial inclusion efforts are reaching most women in the community enabling them to invest in businesses, education and household improvements. When asked if women are allowed to make decisions over their income, 149 (97.4%) of the respondents agreed with this statement while 4 (2.4%) disagreed. This reflects a strong level of control over earnings which can enhance household welfare and participation in community development activities. Respondents were asked if business ownership empowers women and 145 (94.8%) agreed that women own or co-own businesses or income-generating activities while only8 (5.2%) disagreed. This demonstrates a high level of entrepreneurial engagement. When asked if women access training or education to improve their economic status, all the respondents 153 (100%) agreed to this. This reflects the effectiveness of capacity-building programs and suggests a strong potential for ongoing skills enhancement and economic growth.

Table 7

Summary of the findings on Social Economic Development

Socio Economic Development	Agree		Undecided		Disagree	
	F	%	F	%	F	%
There are more income-generating opportunities for women in my community than in the past.	153	100	00	00	00	00
Women are able to meet my basic needs through current income.	145	94.8	00	00	8	5.2
Access to financial services (e.g., loans, savings) has improved.	146	95.4	00	00	7	4.6
Women have access to decent and stable employment.	142	92.8	00	00	11	7.2
Entrepreneurship is supported and promoted in my area.	153	100	00	00	00	00

The respondents were asked if there are more income-generating opportunities for women in the community now than in the past and all the respondents 153 (100%) agreed that there are more income generating opportunities for women in their community compared to the past. This indicates prevalence of economic growth and diversification of livelihood. When asked whether women are able to meet basic needs from current income, 145 (94.8%) of the respondents agreed to this and only 8 (5.2%) indicated otherwise showing the presence of economic vulnerability among some women. Respondents were also asked if there was improved access to financial services and 146 (95.4%) indicated improved access to financial services such as loans and savings, however, 7 (4.6%) indicated lack of adequate access suggesting that financial inclusion efforts are strong but not yet universal. When asked if women have access to decent and stable employment 142 (92.8%) of the respondents agreed to this while 11 (7.2%) reported otherwise meaning some

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women still remain in unstable or low quality jobs which may limit their economic resilience. When asked if there is strong promotion of entrepreneurship among women, all the respondents, 153 (100%) agreed. This reflects a highly favorable environment for small business creation and self-employment initiatives.

4.4 Hypothesis Testing

H_{01}: There is no significant effect of women's economic empowerment on socio-economic development in Kabale Municipality, Uganda.

Table 8

Model Summary for Women Economic Empowerment and Socio Economic Development

Mode l	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	. 874[a]	.763	.924	.15216

a. Predictors: (Constant), women economic empowerment

The coefficient of determination R (0.674) indicates that women's economic empowerment had a significant positive effect on socio-economic development. This implies that higher levels of economic empowerment among women was associated with stronger socio-economic development. Consequently, the value of R-square (0.763) implies that, 76.3% of variation in socio-economic development in Kabale municipality is as a result of women's economic empowerment.

Table 4

Regression Output Summary for Women Economic Empowerment and Social Economic Development

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.385	.134		2.882	.005
Women economic empowerment	.921	.030	. 674	0.953	.000

a. Dependent Variable: Socio economic development

The results in table 9 above further revealed a regression coefficient of 0.674 at a 0.05 significance level indicating a positive and significant effect of women economic empowerment on social economic development. This confirms that women economic empowerment influenced socio-economic development in Kabale Municipality, with a Beta value of 0.674 at a 95% confidence level. Additionally, the **p** value of the coefficient of women economic empowerment is 0.000 < 0.05. In this case, the study rejected the null hypothesis that there is no significant effect of women economic empowerment on socio-economic development in Kabale Municipality, Uganda and fail to reject the alternative hypothesis. Based on such findings, the study concludes that women economic empowerment positively and significantly affects socio-economic development in Kabale Municipality, Uganda (t-statistic=.953, p-value = 0.000 < 0.05).

4.5 Discussion

The study sought to examine the effect of women's economic empowerment on socio-economic development in Kabale Municipality, Uganda. The study findings indicated a significant and positive relationship between women's economic empowerment and socio-economic development. These results indicate that when women have access and control to land or property and have access to financial services such as loans or savings, they can contribute effectively to the socio-economic development of kabale municipality. Additionally more women are involved in the decision making process, given access to formal training or education and also allowed to own or co-own business or income-generating activities within the community, socio-economic development is likely to be enhanced and greatly improved. These findings are in line with the findings by Alemu et al., (2022) who found out that women's involvement in income generating activities is strongly correlated with poverty reduction and improved living standards. Additionally the findings by Duflo (2012) also revealed that microfinance and inclusion initiatives for women generate broader benefits improving education and health outcomes for families. In line with the findings, studies by (Goldin, 2024) also reveal that when women who are economically empowered tend to invest more in their children's education and health resulting in intergenerational improvements in human capital. On the contrary, these findings differ from the findings by Folbre (2014) who found out that economic empowerment programs often ignore deeply entrenched patriarchal norms that limit women's ability to fully capitalize on economic opportunities. Razavi (2016) also emphasized that even when women control income, cultural and institutional barriers can prevent these gains from translating into broader community development. Furthermore, Cornwall (2016) warned that focusing only on economic empowerment risks individualizing development challenges and overlooking the need for systemic social change.

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V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The study concluded that women's economic empowerment has a strong and statistically significant and positive effect on socio-economic development in Kabale Municipality as evidenced by the high correlation ($R = 0.874$) and R^2 value of 0.763. The regression coefficient ($\beta = 0.674$ and $p = 0.000 < 0.05$) confirms that increasing women's economic empowerment through access to financial resources, business opportunities and employment directly improves socio-economic outcomes such as income levels and overall community well-being.

5.2 Recommendations

There is a need to organize practical business training programs for women focusing on entrepreneurship, record-keeping, marketing and value addition. In addition, financial literacy and investment planning should be integrated into ongoing women's community development initiatives to ensure that income growth translates into sustainable wealth creation. Furthermore, the establishment of municipal-level women's business incubation centers would provide platforms for mentorship, innovation and networking thereby enhancing women's capacity to participate effectively in socio-economic development.

REFERENCES

Agaba, D. K. (2024). Analysing the implementation of refugee laws and policies in relation to women and girls: A case of Kampala, Uganda. *African Human Rights Law Journal, 24*(2), 684–719.

Agarwal, S., & Lenka, U. (2016). An exploratory study on the development of women entrepreneurs: Indian cases. *Journal of Research in Marketing and Entrepreneurship, 18*(2), 232–247.

Aizer, A. (2010). The gender wage gap and domestic violence. *American Economic Review, 100*(4), 1847–1859.

Alemu, A., Woltamo, T., & Abuto, A. (2022). Determinants of women participation in income generating activities: Evidence from Ethiopia. *Journal of Innovation and Entrepreneurship, 11*(1), 66.

Alkire, S., & Deneulin, S. (2009). The human development and capability approach. In *An introduction to the human development and capability approach* (pp. 22–48). Routledge.

Amin, A. (2005). Local community on trial. *Economy and Society, 34*(4), 612–633.

Balyejjusa, S. M. (2015). Uganda's vision 2040 and human needs promotion. *Africa Development, 40*(4), 61–90.

Bandiera, O., Buehren, N., Burgess, R., Goldstein, M., Gulesci, S., Rasul, I., & Sulaiman, M. (2020). Women's empowerment in action: Evidence from a randomized control trial in Africa. *American Economic Journal: Applied Economics, 12*(1), 210–259.

Banerjee, S., Alok, S., & George, B. (2020). Determinants of women empowerment as measured by domestic decision-making: Perspective from a developing economy. In *Advanced issues in the economics of emerging markets* (pp. 1–12). Emerald Publishing Limited.

Bauer, G., Darkwah, A., & Patterson, D. (2017). Women and post-independence African politics. In *Oxford Research Encyclopedia of African History* (pp. 167–181).

Brody, C., De Hoop, T., Vojtkova, M., Warnock, R., Dunbar, M., Murthy, P., & Dworkin, S. L. (2015). Economic self-help group programs for improving women's empowerment: A systematic review. *Campbell Systematic Reviews, 11*(1), 1–182.

Chant, S. (2016). Women, girls and world poverty: Empowerment, equality or essentialism? *International Development Planning Review, 38*(1), 1–24.

Chikwe, C. F., Kuteesa, C. F., & Ediae, A. A. (2024). Gender equality advocacy and socio-economic inclusion: A comparative study of community-based approaches in promoting women's empowerment and economic resilience (2022). *International Journal of Scientific Research Updates, 8*(2), 110–121.

Chompa, M. Y. (2022). Understanding of women empowerment and socio-economic development: A conceptual analysis. *Patan Pragya, 10*(01), 135–144.

Christopher, L. (2021). Women empowerment and economic prosperity in Uganda: A case of Kabale District [Doctoral dissertation, Kabale University].

Cornwall, A. (2016). Women's empowerment: What works? *Journal of International Development, 28*(3), 342–359.

Coulter, J. E., Witinok-Huber, R. A., Bruyere, B. L., & Dorothy Nyingi, W. (2019). Giving women a voice on decision-making about water: Barriers and opportunities in Laikipia, Kenya. *Gender, Place & Culture, 26*(4), 489–509.

Duflo, E. (2012). Women empowerment and economic development. *Journal of Economic Literature, 50*(4), 1051–1079.

Folbre, N. (2014). Who cares. A feminist critique of the care economy. New York: Rosa Luxemburg Stiftung.

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Fraser, A. S., & Tinker, I. (2004). *Developing power: How women transformed international development*. Feminist Press at CUNY.

Goetz, A. M., & Gupta, R. S. (1996). Who takes the credit? Gender, power, and control over loan use in rural credit programs in Bangladesh. *World Development, 24*(1), 45–63.

Goldin, O. (2024). The impact of women's empowerment on human capital of the next generation: Looking within the household. *Gender Equality and Economic Development in Sub-Saharan Africa, 1*(9), 165–219.

Gumede, V. (2022). Estimating the role of government in socio-economic development in South Africa. *Journal of Economics and Management Sciences, 5*(2), 34.

Jackson, T. (2019). The post-growth challenge: Secular stagnation, inequality and the limits to growth. *Ecological Economics, 156*, 236–246.

Jaquette, J. S. (2017). Women/gender and development: The growing gap between theory and practice. *Studies in Comparative International Development, 52*, 242–260.

Klasen, S., & Lamanna, F. (2009). The impact of gender inequality in education and employment on economic growth: New evidence for a panel of countries. *Feminist Economics, 15*(3), 91–132.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610.

Milazzo, A., & Goldstein, M. (2019). Governance and women's economic and political participation: Power inequalities, formal constraints and norms. *The World Bank Research Observer, 34*(1), 34–64.

Nabi, S., & Yasmin, E. (2025). Women empowerment and socio-economic indicators: An empirical study of domain analysis. *The Indian Journal of Labour Economics, 9*(4), 1–21.

National Environment Management Authority. (2023). *Revised strategic plan 2023–2027*.

Razavi, S. (2021). The sustainable development goals: Reflections from a feminist economics perspective. In *The Routledge handbook of feminist economics* (pp. 441–449). Routledge.

Seguino, S. (2020). Engendering macroeconomic theory and policy. *Feminist Economics, 26*(2), 27–61.

Shoma, C. D. (2019). Financing female entrepreneurs in cottage, micro, small, and medium enterprises: Evidence from the financial sector in Bangladesh 2010–2018. *Asia & the Pacific Policy Studies, 6*(3), 397–416.

Tandon, T. (2016). Women empowerment: Perspectives and views. *The International Journal of Indian Psychology, 3*(3), 6–12.

Tizikara, C., Nakayiwa-Mayega, F., & Otto, F. (2019). Investing in women as drivers of growth: A gender-based assessment of the science, technology and innovation ecosystem in Uganda. *African Journal of Rural Development, 4*(2), 261–281.

Todaro, M. P., & Smith, S. C. (2009). *Economic development*. Pearson Education.

Uganda Bureau of Statistics (UBOS). (2019). *Projections of demographic trends in Uganda*. Uganda Bureau of Statistics.

Welzel, C., Inglehart, R., & Kligemann, H. D. (2003). The theory of human development: A cross-cultural analysis. *European Journal of Political Research, 42*(3), 341–379.

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Assessment of resilient capacities of typical and entrepreneurial dairy farms in Narok-Bomet and Nyandarua counties, Kenya

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ABSTRACT

The dairy sector in Kenya is constrained by recurrent shocks spanning from climate change, which adversely intensifies production risks, to market risks coupled with poor infrastructural and technological advancement and institutional and financial risks. A move towards a robust, reliable, adaptive intensification and resilient dairy sector would ensure sustainability of the dairy farms in the face of these constant and intense shocks. This study examined the resilience capacities of 120 typical and entrepreneurial farms in Nyandarua County, with advanced dairy growth stage, and Narok County, with dairy growth at its inception phase. It is assumed that typical and entrepreneurial farms have different resilience capacities, with entrepreneurial farms perceived to be richly endowed and skilled, conferring higher resilience scores than typical dairy farms, which are also affected by environmental contexts. The resilience theory provides a platform for comprehending how farming systems react to risks and shocks through the three resilience frameworks, namely absorptive, adaptive, and transformative capacities. The study adopted a comparative cross-sectional design, aiming to explore differences in risk perception and coping strategies between typical and entrepreneurial dairy farmers. Both qualitative and quantitative data were collected using structured questionnaires and analyzed statistically. Using the stratified sampling method, cooperatives were identified, and a list of farmers selling to the cooperatives was categorized as typical if they sold up to 50 liters of milk with no increase over the last 5 years. Otherwise, they were entrepreneurial farmers if they consistently sold over 50 liters of milk with growth over the same period. Indicators for resilience were captured by use of indicators for absorptive, adaptive, and transformative resilience capacities. The indicators were first standardized and then weighted through Principle Component Analysis (PCA) using SPSS version 23 and finally fitted into a fractional regression model to generate the resilience indices. Absorptive and adaptive capacities were weak in both farm groups, with information systems, social networks, and human capital indicators being underutilized, whereas physical assets contributed significantly to these frameworks. Greater transformative capacity was demonstrated by entrepreneurial farms than in typical farms, with institutional and infrastructural indicators contributing significantly to the index. The overall resilience for both farm types was below 0.5, indicating an overall systemic vulnerability. Entrepreneurial farms had statistically higher resilience scores than typical farms. Enhancing resilience across the two farm types calls for strengthened human capital, social capital, extension services, and investment in infrastructure, which supports dairy farming.

Keywords: Capacities, Dairy Growth, Market Access, Resilience Indicators, Resilience, Social Networks

I. INTRODUCTION

Animal agriculture in a developing country such as Kenya is vulnerable to multiple shocks and they are more frequent and intense. There are climate-related shocks and others include natural disasters, food price volatility, financial crises, health crises and political unrests (Zseleczky &Yosef 2014). Vulnerability of animal agriculture to these shocks has been attributed to several underlying factors including low adaptive capacity, high rates of poverty, lack of safety nets, over-reliance on natural resources and imperfect knowledge of forecast prices and weather changes (Tofu et al., 2025; Bahta & Lombard 2023). In Kenya, the dairy farming experiences multiple shocks, varying from feed scarcity, market fluctuations, poor infrastructural development, limited access to veterinary services and artificial insemination, financial resources to poor technical and technological skills among others (Odero-Waitituh, 2017). Yet the ability to avert these risks is reported to be decreasing and threatening the sustainability of the dairy industry (Kassie et al., 2015). A move towards a robust, reliable, adaptive intensification and resilient dairy sector would ensure sustainability of the dairy farms in the face of constant and intense shocks (Rademaker et al., 2016; Perin & Enaharo, 2023).

The structural elements of resilience are absorptive, adaptive and transformative capacities (Bec et al., 2016). Three factors determine the employment of the three resilience capacities and the overall resilience of a system; the

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threshold of change that a system can tolerate, the capacity to self-organize and lastly the ability to build and increase learning, adapting, and where necessary transforming (Folke et al., 2010). As conceptualized by Bebe et al. (2017), farm resilience is influenced by risk perception, resource endowments and the ability to self-reorganize. Absorptive capacity, also known as buffer capacity, is comparable to persistence (Folke et al., 2010). It is commonly exhibited during small agitations and initial phases of coping with large shocks which involves use of available resources such as financial reserves, feed stocks, labour flexibility and social networks to respond to shocks such as market fluctuations, climatic events or disease outbreaks (Shadbolt et al., 2017). It is the ability of dairy farms to resist it effectively, that is, to absorb its impacts without consequences for its function, status, or state. When the absorptive capacity is exceeded, the individual will then exercise their adaptive resilience (Cutter et al., 2008). Adaptive capability is the ability of a system to adjust in the face of changing external drivers and internal processes, thereby allowing for development while staying within the current regime (Folke et al., 2010). It is the ability to either control the trajectory of the system (change precariousness), change the topology of the stability landscape (latitude and resistance), or change the processes in response to dynamics at other scales (Berkes & Ross 2016). This capacity involves "resourcefulness-the potential to identify challenges, develop priorities, and mobilize resources, to integrate experience and knowledge during crises, to plan for upcoming shock impacts". It is a factor of both experience and knowledge (Shokri 2022).

Adaptive capacity is influenced by economic and infrastructural development, education, technology, knowledge, institutions, equity and social capital (Kruse & Pütz, 2014). At the local level, this capacity is influenced by factors such as managerial ability; access to financial, technological and information resources; infrastructure; the institutional environment within which adaptations take place; political influence and kinship networks (Haider & Cleaver, 2023). When this capability is exceeded, transformative resilience is put in place. Transformative capacity refers to system-level changes that enable more lasting resilience and often challenge the status quo in a substantial way (O'Brien, 2012). It is the capacity to create a fundamentally new system when ecological, economic, or social (including political) conditions make the existing system untenable. It is a course to innovation, alternatives and possible futures. Determinants of transformability include incentives to change, cross-scale awareness, experimentation, reserves, and convertible assets and supported by inclusive governance, social learning, extension services and innovation to enable shift in practices, technology and institutional arrangement (Wolfram et al., 2019). Transformations may well be sparked by crisis (Coquil et al., 2014).

Measuring resilience is quite challenging due to its multi-scale, multi-dimensional and time specific nature. Quantifying resilience in farms present a major challenge in resilience literature due to its multidimensional and dynamic nature which varies across time, individual and production context (Taghipoor et al., 2023). Levine (2014) identified five approaches currently in use for measuring resilience which include: quantification based on functionality, quantification based on indicators and characteristics, quantification based on food access, quantification based on activities and quantification derived from theoretical resilience frameworks. The use of novate indicators is suggested for measuring resilience in farming systems. Use of indicators to measure farm resilience was also adopted by a study by Khan et al. (2014) emphasizing that resilience can be quantified through by assessing its three core capacities – absorptive, adaptive and transformative, using indicators.

Resilient dairy farms not only adapt to change in the environment, but also take advantage of opportunities created by the disturbance while maintaining productive capacity in the face of variability in production financial and market related factors (Meuwissen et al., 2019). There are clusters of factors that interact across temporal and spatial scales which influence resilience building in farms which include connectivity, spatial heterogeneity, and the capacity of systems to reorganize across different scales, which are crucial for sustaining ecosystem functions and adaptive governance (Cumming et al., 2017). Additionally, planning, communication, collaboration, and diversification each align with social capital theory which is encompassed within more recent interpretations of community resilience are key to building resilient farming systems (Bec et al., 2016). Further, a study by Perrin et al. (2020) noted that the key features of resilient dairy farming systems include farm diversity, autonomy, flexibility and strong farmer networks. Cafer et al. (2022) indicated that integration of social, economic and agro-ecological factors where farmers actively engage in learning, innovation and collaboration increase their capabilities to effectively respond to shocks and stresses and build resilient farming systems.

Robust infrastructure, strong farmer knowledge networks and adaptive decision making have been reported to enhance resilience capacities of farming systems enabling them to recover from shocks and stressors effectively (Urruty et al., 2016). In dairy farms, investment of herds which are disease resistant, with high fertility, longevity ensures stable production of milk under sub-optimal conditions thereby maintaining farm income (Bengtsson et al., 2022). Nettle et al. (2015) highlight that resilient farming systems are characterized by features such as flexibility in decision-making, strong farmer networks, continuous learning, and proactive risk management. Resilient farmers should also learn to live with uncertainties and disturbance (Mendoza et al., 2019; Sinclair et al., 2022). Careful disturbances within threshold limits make the system develop good reorganization responses and make it even stronger (Rudberg & Karpouzoglou 2022). It sets the motion of renewal and reorganization into motion and facilitates heterogeneity. This factor points out

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the need to building a memory of past events, abandoning the notion of stability, 'expecting the unexpected' and increasing the capability to learn from crisis (Darnhofer 2021). This makes farmers proactive and well equipped in case of any disturbance contributing to sustainability of these farms which is important in continuity as the system goes through changes because it can be tapped into to build more resilient systems (Grafton et al., 2019).

Resilient farmers nurture diversity in their farms. Diversifying activities and thus income sources, both on- and off-farm, is a widespread strategy by family farms to enhance their resilience (Cochrane & Cafer 2018). It is an important role in strengthening adaptive capacity, since it provides the seeds for new opportunities and thereby increases the options for coping with shocks and stresses (Noriega et al., 2017). An agro-ecosystem with a heterogeneous livelihood, pattern of land uses and crops more resilient. Heterogeneous landscapes enable dynamic relationships between populations. At the farm level, there are various 'variables' that contribute to diversity, such as: biodiversity (incl. diversity of crops grown), diversity of economic opportunities, diversity of resources, diversity of communication and partners, diversity in relationship types (Dardonville et al., 2020). Combining different types of knowledge and learning also built resilient systems (Ross et al., 2024). Traditions such as indigenous knowledge, institutions, seed, banks, and biophysical resources which should be well guarded and employed accordingly to enhance resilience (Šūmane et al., 2018). Combination of scientific information with traditional knowledge, and the ability to share insights, to bring together parties with different relative strengths in terms of knowledge and backgrounds and thus to create learning environments which are key to resilience building (Tiwari et al., 2023). This built upon social resources such as knowledge, skills, experience that can be mobilized through social relationships and membership in networks (Shittu et al., 2018). At the farm level, this can be found in the variety of information sources that farmers tap into and use to make decisions, in the variety of networks they are involved in, and their ability to build on past experiences and traditions (Duranovich et al., 2015).

The degree to which farmers, consumers, and other stakeholders can organize themselves as individuals, local and regional networks, and smaller institutions of governance can be more responsive and adaptable to changing conditions (Ortiz & Peris 2022). Linkages at high hierarchy and low hierarchy; good governance structures, layout should be overlapping to the grass roots whereby local institutions gather information faster and respond rapidly to changes whereas high level provide technical expertise and supporting during crises (Feye, 2018). At the community level, the ability to self-organize is strongly linked to social competencies. Ability to cooperate and build networks is key for future survival, as with increasing economic pressure, smaller farms can only survive if they cooperate with one another, pool their resources together and make a significant change. Existing agricultural framework and policies shape the farmers' decision and flexibility on how to respond to risks and shocks whereas rigid and misaligned regulations can constraint farmers' ability to adapt and undermine long term sustainability. They also ought to believe in their capacity to overcome stressful situation (Spiegel et al., 2020).

Self-efficacy relates to the ability of the community to maintain the local capacity for social and political organization, rather than relying on external intervention (Peng et al., 2020). Osumba et al. (2021) indicated that access to basic services such as roads, markets, extension, and credit significantly enhances the resilience capacities of smallholder farms by improving their ability to anticipate, absorb, and recover from shocks. Williams et al. (2020) added that unequal access to these services leads to disparities in resilience outcomes, with marginalized farmers often left more vulnerable despite the implementation of broader resilience strategies. Knickel et al. (2018) emphasized that access to basic services such as healthcare, education, infrastructure, and advisory support which enable farmer' ability to cope and adapt to shocks by improving their well-being, decision making capacity and contribution to wider support networks thereby contributing to more sustainable and equitable farming systems.

1.1 Statement of the Problem

Typical and entrepreneurial dairy farms pervasively confront multiple and recurrent risks but are likely to respond differently depending on their risk perception, resource endowments, and managerial skills. Compared to typical dairy farms, entrepreneurial dairy farms are proactive, richly endowed with resources, and higher risk-taking, but are these attributes a pathway to higher resilience capacity. Identifying the resilience capacities of typical and entrepreneurial dairy farms can inform effective interventions for increasing resilience capacity for a stable and sustainable dairy-based livelihood. These will ultimately inform the government to develop policies in the dairy sector that minimize the risks in the best way possible and to strengthen the resilience capacities of the community to ensure sustainable dairy farming.

1.2 Research Objectives

i. Identify the key indicators of the three resilience capacities in typical and entrepreneurial dairy farms
ii. Quantify resilience indices among the typical and entrepreneurial dairy farms.

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II. LITERATURE REVIEW

2.1 Theoretical Review

The resilience theory provides a platform for comprehending how farming systems react to risks and shocks through the three resilience framework namely absorptive, adaptive and transformative capacities. As conceptualized by Folke et al (2010), resilience is defined as the ability to absorb disturbances, self-organize, adapt or transform when necessary. Whereas absorptive capacity relates persistence buffering using resources, adaptive capacity is the ability to self-reorganize and learn to cope with scaled up challenges while transformative resilience offers an environment to shift to enhance long term viability.

As explained by Bec et al. (2016), thresholds of change, self-organization and continuous learning influence the resilience capacity. The social capital theory supports the theory of resilience by emphasizing the pivotal roles of networks, trust and cooperation in coping with shocks. Community resilience frameworks emphasize on the need for good governance structures, equity and participation at grass root levels as key to adaptive and transformative resilience (Norris et al., 2008). According to social-ecological systems theory by Cinner and Barnes (2019) institutions shape resilience capacities in dairy systems which plays a key role on adaptive governance and feedback mechanisms. In a nexus, these theories underlines the multi-dimensionality of resilience, which is also shaped by physical resources, socio-cultural factors and institutional resources.

2.2 Empirical Review

Empirical studies indicate that the high vulnerability of the smallholder dairy farming to shocks and stressors affect its productivity. The resilience scores of Ghanaian households was found to be below 0.5 indicating the high vulnerability to these shocks and stressors (Tambo & Wünscher, 2017). Livestock ownership and land were highlighted to be key buffers against climate and market risks (Asmamaw et al., 2019; Debie &Ayele, 2023). The weak social capital as reported by Egamberdiev (2024) have been reported to be among the limiting factors to resilience. Institutional support and information sharing have shown to enhance adaptive capacity as found out by Weldegebriel & Amphune (2017) in Ethiopia. Context specific mechanization as demonstrated by Mizik (2021) was found to improve the resilience capacity. The key drivers of transformative capacity were highlighted to be governance and market access by a study by Frankenberger et al. (2014).

In another study, Urruty et al. (2016) reported knowledge networks and robust infrastructures play pivotal role in improving recovery from shocks. Nettle et al. (2015) findings reported that proactive risk management, flexibility and farmer networks are key to resilient systems. Membership, trust and information exchange through social capital and farmer learning networks was reported to significantly strengthen farm resilience by improving adaptation and transformation capacities (Sinclair et al., 2022). In their study, Hassan and Akkermans (2022) showed that human, natural, social and financial capitals were significant determinants of dairy farmers' adaptive capacity in Ziway-Shashemene in Ethiopia with physical assets being strong predictors. Institutional and financial access were also reported by smallholder livestock farmers in South Africa to play pivotal role in resilience (Maltou & Bahta 2019). Overall, the empirical evidence emphasize that a balanced combination of physical assets, social capital and institutional supports are key requirements to building resilient dairy systems.

III. METHODOLOGY

3.1 Study Areas

Nyandarua County is in the Central part of Kenya and represents areas with medium and high potential dairy production that have reached a stage of more developed dairying. It experiences temperatures in the ranges of 6°C to 9°C (43°F to 48°F) in July at minimum and 18°C to 25°C (64°F to 77°F) in December, maximum and an altitude between of 2,000-3,900 meters. The county has two rainy seasons, with the long rain season from March to May (1700 mm rain), and a short rainy season from October to December (700 mm rain).

Narok and Bomet Counties are located in the South-western part of Kenya and are representative for areas with dairy farms in the inception stage of dairy development, in areas with low production potential. Here, temperatures range from a minimum of 8°C to a maximum of 28°C. The counties experience two rainy seasons: the long rains from March to May and the short rains from October to December, with an average annual rainfall ranging from 1,000 to 1,400 mm and two dry seasons separating the two. A few respondents were sampled in Bomet County, close to the Narok-Bomet county border, with similar less-developed dairy cooperatives and market access. Typical dairy farmers are smallholders who have shown minimal growth in milk sales and limited adoption of external inputs over the past five years. In contrast, entrepreneurial smallholder dairy farmers are characterized by a gradual but consistent increase in both milk sales and the utilization of external inputs during the same period.

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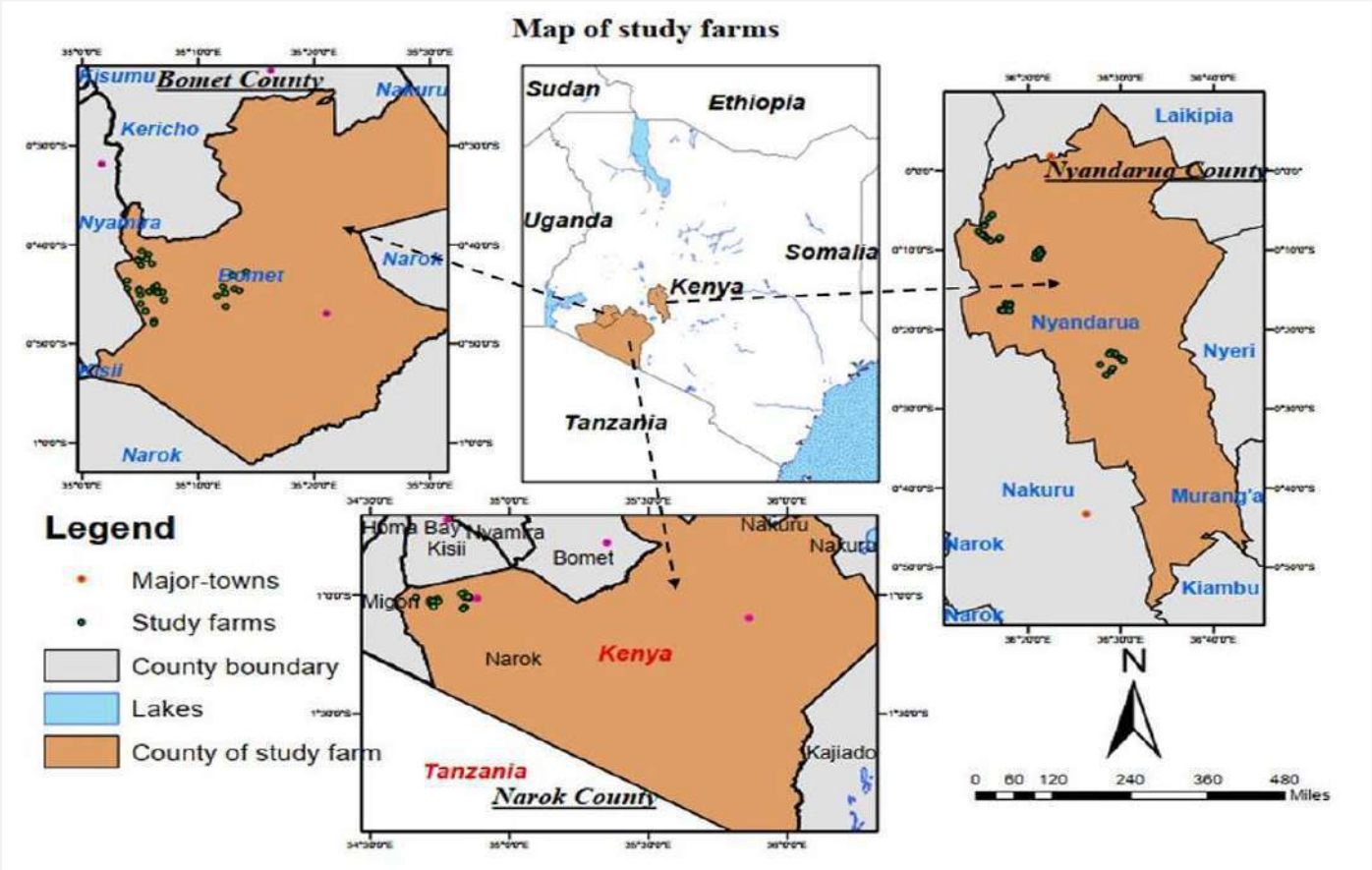

Figure 1
Map of the study areas - Nyandarua and Narok

3.2. Research Design

The study adopted a comparative cross-sectional design, aiming to explore differences in risk perception and coping strategies between typical and entrepreneurial dairy farmers. Both qualitative and quantitative data were collected using structured questionnaires and analyzed statistically. The research was grounded in identifying significant indicators in resilience capacities using descriptive statistics and Principal Component Analysis (PCA). This design enabled in-depth understanding of both farmer categories across different agro-ecological zones. The methodology was suitable for quantifying and comparing resilience indices under varied dairy development stages.

3.3 Targeted Population

The target population comprised smallholder dairy farmers in the two counties, particularly those affiliated with cooperatives, milk processors, or milk collection centers. Farmers were categorized as typical if they sold up to 50 liters of milk per day with no production increase over five years, and entrepreneurial if they sold more than 50 liters daily with consistent growth. The distinction ensured that participants represented contrasting production intensities and investment behaviors. The population included men and women, farming under diverse socio-economic and environmental conditions. These groups were ideal for understanding how varying risk exposures influence adaptive strategies.

3.4 Sampling and Sample size

Dairy farms at sampling were stratified by stage of dairy development (less and more). Lists of farmers were obtained from local dairy cooperatives and milk marketing channels in the target counties. Using Arsham's formula for determining sample size with a standard error of 0.04562 and 95% confidence interval, a sample of 120 farmers was selected: 60 from Nyandarua (27 typical, 33 entrepreneurial) and 60 from Narok-Bomet (29 typical, 31 entrepreneurial). This selection ensured fair representation across both dairy development stages and farmer categories. Final respondents were randomly selected from categorized lists, ensuring statistical validity and minimized selection bias. Use of indicators was to quantify resilience capacities of these farms as per the following indicator table:

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Table 1

Indicator Variables for Measuring the Resilience Capacities

Indicator Variable	Description	Measurable Unit
Absorptive Capacity		
Risks, how severe in your dairy practice, satisfaction level in coping with them	Sensitivity, Preparedness	Percentage
Member to which groups? How relevant is each to your dairy farming, 5 years?	Membership to CBO's	Count and % relevance
Number of social safety net programmes household participates in.	Social Safety nets	Count
Availability of insurance	Number of assets insured.	Amount
Access to cash savings	Amount	Amount
Access to remittances	Amount	Amount
Asset ownership	Amount	
Adaptive Capacity		
Activities in farm contributing to your livelihood?	No. of income sources	Count
Activities outside the farm add to income.	Number	Count
Confidence in dealing with risks.	Percentage	Percentage
When did you start dairy farming?	No. of years in dairy	Number
Workers, how many casual/permanent, payment.	Expenditure	Ksh.
Their education level of the workers?		
Any special training for the workers on dairy, explain		
Did you buy any machine or equipment over the past 5 yrs?	Assets	Count
Land: own? Lease? Rent?	Total land owned	Acres
Land use; Building? Crop? Trees? Grass? Rest?	Land use	Acres
How many animals? Species? Breeds? Number	Tropical Livestock Units	TLU
Number of available climate change adaptation strategies	Adult vs Minor	Count Ratio
Exposure to information	Information sources	Count
Improved practices	practices	Count
Transformative Capacity		
Access to basic public services,	Distance to water source	Km
such as market, health services,	Distance to health facility	Km
primary school, road, credit and	Distance to market	Km
electricity, network coverage,	Binary	Binary
veterinary extension services	Distance	km
Police station	Distance	km
Communal; land, water, firewood, irrigation	No./amount accessible	specific km

Source: *adopted from Asmamaw, (2019), Tambo, (2016)*

3.5 Data Analysis

The three resilience capacities absorptive, adaptive, and transformative was computed by use of indicator weights generated by PCA and fitted on a multiple linear regression model to get the resilience indices through the following steps.

Step 1: Normalization of the indicators: The aim of this step is to standardize the range of the continuous initial variables so that each one of them contributes equally to the analysis. More specifically, the reason why it is critical to perform standardization prior to PCA, is that PCA is quite sensitive regarding the variances of the initial variables. That is, if there are large differences between the ranges of initial variables, those variables with larger ranges dominate over those with small ranges, which would lead to biased results. The method used for normalization is that used in the Human Development Index. Where indicators were normalized for those directly proportional:

$$tnorm = \frac{tij - tmin}{tmax - tmin}$$

While for those indirectly proportional

$$tnorm = \frac{tmax - tij}{tmax - tmin}$$

Step 2: Assign weight to each indicator using Principal Component Analysis (PCA). Commonly used methods for assigning weights include arbitrary choice of equal weights, expert judgement, and statistical methods (Gbetibouo *et al.*, 2010).

Step 3: Compute the absorptive, adaptive, and transformative resilience capacities. The weights loadings obtained from PCA first principle components were fit into a fractional regression model to compute for absorptive,

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adaptive and transformative resilience scores so that the final score would have a maximum of one using the formula below:

$$ARC_j = \frac{\sum_j^k B_j X_{ij}}{\sum_{j=1}^k [B_j]}$$

Where ARC_j = absorptive resilience capacity

B_j*= PCA rotated loading (can be negative) for a specific indicator

X_{ij}= Observed indicator value for farmer for a specific indicator

Numerator = sum of product of PCA loading and observed values for all independent variables

Denominator= absolute value of sum of PCA loadings

*Step 4***:** Computing resilience index by fitting multiple linear regression model

$R_{ij} = (ABS_i + ADP_i + TNS_i)/3$

Where *R* is resilience; *i* is household; ABS is the absorptive capacity, ADP is the adaptive capacity and TNS transformative capacity.

IV. FINDINGS & DISCUSSION

4.1 Indicator Weights for Absorptive Capacity

In typical farms in Nyandarua, PCA results for Principle Component 1 (PC1) had a KMO of .463 and explained a variance of 72% assigned weights of the factors as follows: TLU (.899), Land (.885) indicating access to livestock and land play pivotal role in absorbing and recovering from small agitations. Equipment (0.179), financial access (0.087), mutual groupings (0.061) and sensitivity to risks (0.045) contributed minimally to the absorptive capacity. Other groupings (-0.178) and social networks outside (-0.322) negatively contributed to the absorptive capacity in typical farms in Nyandarua. The findings suggested that physical assets were more influential on absorptive resilience capacities compared to institutional and social capital among typical farms in Nyandarua County. Typical farms in Narok PCA had KMO of .460 and explained a variance of 68% assigned weights of the components as follows: Land (.894), Equipment (.761), TLU (.681), On the other hand, institutional and financial access contributed negatively to the score indicating a gap in effective institutional support systems.

In entrepreneurial farms in Nyandarua, PCA results for PC1 had KMO of .511 and explained a variance of 75% assigned weights of the factors as follows; Land (.894), TLU (.887), Social Networks (.262), Risk sensitivity (.149), Equipment (.229) whereas mutual networks (-0.300) and financial access (-0.165) conferred negative weighting on the score. In entrepreneurial farms in Narok, PCA results with KMO of .373 and explained a variance of 75% assigned weights of the factors as follows: Land (.957), TLU (.804) while other variables had minimal or negative influence. These findings suggests entrepreneurial farms prefer independent model operations linked to physical assets with livestock and land being the primary buffers against risks.

Table 2

Indicator Weights for Absorptive Resilience Capacity

Typical - Nyandarua		**Typical Narok**		**Entrepreneurial Nyandarua**		**Entrepreneurial Narok**	
Principle Component 1 Weights in PCA Rotated Varimax							
Total Livestock Unit	0.899	Land	0.894	Land	0.894	Land	0.957
Land	0.885	Equipment	0.761	Total Livestock Unit	0.887	Total Livestock Unit	0.804
Social networks - Outside	-0.322	Total Livestock Unit	0.681	Social networks – Outside	0.262	Grouping	-0.21
Risk sensitivity	0.045	Social networks - Outside	-0.027	Risk sensitivity	0.149	Risk sensitivity	0.140
Equipment	0.179	Mutual networks	-0.048	Equipment	0.229	Financial access	-0.333
Financial access	0.087	Risk sensitivity	0.393	Financial access	-0.165	Mutual networks	-0.112
Mutual networks	0.061	Financial access	-0.090	Mutual networks	-0.300	Social networks - Outside	0.072
Grouping	-0.178	Grouping	0.253	Grouping	-0.071	Equipment	-0.073

These findings are consistent with Karanja et al (2016) who reported livestock assets serve as buffers against climate risks emphasizing the role of TLU in resilience building. In other studies, Mizik (2021) highlighted the

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importance of mechanized equipment for farms in Narok in building resilience to climate-induced risks. The negative associations on social capital and financial access indicates a shift towards independence in Nyandarua county whereas in Narok county the lower role of finance and equipment in absorptive capacity is inclined to access constraints rather than disinterest owing to the distinct stages of commercialization and institutional integration in the two counties. Egamberdiev (2024) study agreed with the findings indicating that underutilized social capital constraint resilience building in food systems. These agreed with Cafer et al. (2022) and Boka and John (2017) findings which accentuates the key roles of social networks in reducing vulnerability and shortening recovery period in the face of shocks. Maru and Chemjor (2013) agreed that social capital is key to resilience building.

4.2 Indicators for Adaptive Capacity

In typical farms in Nyandarua, PCA results with KMO of .421 and explained a variance of 77% assigned weights whereas information sources (-0.786), social networks (-0.454) and dependency ratio (-0.315) contributed negatively to the score. This indicates that farmers rely more on internal resources and assets to adapt to risks rather than off farm resources or extension services. The knowledge exchange, financial and institutional support was under-utilized in the adaptive resilience framework. In typical farms in Narok, PCA results with KMO of .281 and explained a variance of 80% assigned weights of the factors as follows; Land (.916), Equipment (.848) and other on farm resources (0.454) carrying significant positive weights on adaptive capacity whereas social networks (-0.154) and information sources (-0.085) with negative loadings on the score. This shows the limiting factor of knowledge systems, human capital and social connections constraining adaptive resilience capacity across the typical farms.

In entrepreneurial farms in Nyandarua, PCA results with KMO of .417 and explained a variance of 71% assigned weights of the factors as follows; Land (.839), Education (.730), off-farm resources (.627) while negatively but weakly impacted by information sources (-0.170), skilled-unskilled labour ratio (-0.158) and social groupings (-0.098). This implied that adaptive capacity in these farms is inclined to both human capital and physical resources. In entrepreneurial farms in Narok, PCA results with KMO of .480 and explained a variance of 71% assigned weights of the factors as follows; information source (.795), Financial access (.795), Grouping (.702) and negatively but weakly impacted by land (-0.290), social networks (-0.127) and dependency ratio (-0.068). The findings in Narok portrays a network driven adaptive model pegged on collective action, access to market and information sharing.

These findings agree with Weldegebriel and Amphune (2017) whose findings highlighted the prominence of land in adaptive resilience where smaller landholdings reduce conservation efforts. Similarly, Asmamaw et al (2017) findings indicated the key role of information sharing in building the adaptive capacity. Additionally, Frankenberger et al (2015) findings stressed on the positive association between livelihood diversification and resilience while Marshall et al (2013) pointed out on the need for self-reorganize and learning (education) in response to change.

Table 3

Indicator Weights for Adaptive Resilience Capacity

Rotated Varimax Principle Components 1							
Typical Nyandarua		**Typical Narok**		**Entrepreneurial Nyandarua**		**Entrepreneurial Narok**	
Information Source	-0.786	Land	0.916	Land	0.836	Information Source	0.795
On farm resources	0.780	Equipment	0.848	Education	0.730	Financial access	0.795
Off farm Resources	0.054	Experience	-0.028	Off farm Resources	0.627	Grouping	0.702
Experience	0.160	On Farm resources	0.454	Dependency ratio	0.055	Confidence	0.496
Equipment	0.382	Mutual Networks	0.048	Experience	0.093	Dependency ratio	-0.068
Mutual Networks	0.192	Social Networks	-0.154	On farm resources	0.204	Off farm resources	0.331
Dependency ratio	-0.315	Confidence	-0.096	Skilled labour ratio	-0.158	Water source	0.261
Social Networks	-0.454	Education	0.109	Equipment	0.224	Education	0.208
Confidence	0.025	Water source	-0.073	Water source	0.457	Skilled labour ratio	-0.050
Water source	-0.113	Financial access	0.157	Social Networks	0.283	Social Networks	-0.127
Grouping	0.160	Grouping	0.279	Financial access	-0.044	Mutual Networks	0.193
Skilled labour ratio	-0.178	Off Farm Resources	-0.029	Grouping	-0.098	Land	-0.290
Land	0.478	Dependency ratio	0.103	Information Sources	-0.170	On farm Resources	0.206
Education	-0.123	Skilled labour ratio	-0.050	Confidence	-0.002	Experience	0.121
Financial access	-0.043	Information Sources	-0.085	Mutual Networks	-0.070	Equipment	0.065

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4.3 Indicators for Transformative Capacity

In typical farms in Nyandarua, PCA results with KMO of .476 and explained a variance of 68% assigned weights of the factors as follows; Market (.922), veterinary services (.884), security (.873), all-weather road (.675). This signify the importance of institutional infrastructure and functional market systems in fostering transformative resilience in more developed dairy ecosystem like Nyandarua that enables them to leverage market opportunities. In typical farms in Narok, PCA results with KMO of .527 and explained a variance of 60.88% assigned weights of the factors as follows; Access to all-weather road (.865), security (.772), veterinary services (.639) were strongest positive factors. The Narok dairy environs characterized by pastoral production systems and weaker access to basic services prioritized road infrastructure, access to veterinary services and public safety as key enablers to transformation. The negative contributions of market access (-0.16) and community land (-0.25) indicated poor integration and gaps in market connectivity and institutional systems in pastoral areas. The discrepancy in the indicator weights between the two counties stresses on role played by regional development levels in shaping the design and impact of resilience strategies.

In entrepreneurial farms in Nyandarua, PCA results with KMO of .375 and explained a variance of 69% assigned weight of the factors as follows; veterinary services .902, security (.884), market (.824), followed by access to all weather roads (0.498), electricity (0.488). Access to primary schools (-0.06) and forests (-0.11) had negligible negative influence indicating not all community asset contribute to farm transformative capacities. In entrepreneurial farms in Narok, PCA results with KMO of .618 and explained a variance of 70% assigned weight of the factors as follows; veterinary services (.902), Market (.868), security (.841) with moderate contributions from health facilities (0.460), roads (0.358). The findings indicated that the entrepreneurial farms in both Nyandarua and Narok have consistently higher transformative indicator weights.

Similarly, Frankenberger et al (2014) identified governance, infrastructure and access to basic services as the core to transformative resilience. Asmamaw et al. (2017) findings similarly suggested that households with better access to public services and local governance systems become more resilient supported the findings. Geographically isolated communities have been found to limit access to markets, inputs and diversification opportunities that negatively affect their resilience capacities (Burke and Jayne 2010, Tesso et al., 2012). A study by Khan et al. (2014) indicated that road networks affects both efficiency of emergency response and market access stifling resilience capacities. On the other hand, Frankenberger et al. (2015) argued that addressing structural risks and enhancing long-term social cohesion demands for high transformative capacity through infrastructure and human capital.

Table 4

Indicator Weights for Transformative Resilience Capacity

Rotated Varimax Principle Components 1							
Typical Nyandarua		**Typical Narok**		**Entrepreneurial Nyandarua**		**Entrepreneurial Narok**	
Market access	0.922	All weather road	0.865	Veterinary services	0.902	Veterinary services	0.902
Veterinary services	0.884	Security/police post	0.772	Security/police post	0.884	Market access	0.868
Security/police post	0.873	Veterinary services	0.639	Market access	0.824	Security/police post	0.841
All weather road	0.675	Market access	-0.16	Primary school	-0.06	Electricity	0.075
Primary school	-0.4	Health	0.154	Health	0.173	All weather road	0.358
Health	0.193	Electricity	0.447	Electricity	0.488	Health	0.46
Water	-0.33	Forest	-0.12	Forest	-0.11	Water	0.027
Electricity	0.485	Community land	-0.25	All weather road	0.498	Primary school	0.013
Forest	-0.07	Water	-0.06	Water	-0.17	Forest	-0.17
Community land	0.208	Primary school	0.457				

4.4 Mean Absorptive, Adaptive, Transformative, and Overall Resilience Indices

The mean absorptive capacity of typical farms in Nyandarua was (.0246) whereas for typical farms in Narok was (0.2019). The mean absorptive resilience capacities of entrepreneurial farms in Nyandarua was (0.0487) whereas for entrepreneurial farms in Narok was (0.0587). The mean absorptive resilience capacities for both typical and entrepreneurial farms in both Narok and Nyandarua were all below 0.5 out of a maximum of one implying a dismal level across the farm types in both developed and less developed dairy growth environments.

Adaptive capacities in Nyandarua county for typical farms was 0.004 and entrepreneurial 0.273 whereas in Narok county, the mean adaptive index for typical farms was 0.216 and entrepreneurial farms was 0.347. These results support findings by Asmamaw et al. (2019), who also reported suboptimal adaptive resilience among farming

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households. This calls for the need to strengthen institutional, social, human capital and access to services to improve the adaptive resilience capacity.

Transformative capacity was consistently higher than both adaptive and absorptive capacity. In Nyandarua, the mean transformative capacity in typical farms was 0.3310 while in entrepreneurial farms was 0.4566. In Narok-Bomet county, mean transformative resilience capacity in typical farms was 0.4134 whereas in entrepreneurial farms was 0.2481. The sum of absorptive, adaptive and transformative capacities was used to generate the overall resilience score with the maximum index being 1 and an average of 0.5. Across the four farm types, the mean resilience score was below 0.5 indicating the resilience index being below average. The typical farms in Nyandarua had 0.1199 while entrepreneurial farms in had 0.2594 entrepreneurial farms. In Narok-Bomet, typical dairy farms had 0.2770 while entrepreneurial farms had 0.2180.

Table 5

Mean Absorptive, Adaptive, Transformative, and Overall Resilience Indices

	N	Minimum	Maximum	Mean statistic	Mean std error	Std. Deviation	Variance
Absorptive resilience indices							
Absorptive capacity Nyandarua	27	-0.034	0.1077	0.0246	0.0063	0.0325	0.001
Absorptive capacity Narok	29	0.0532	0.548	0.2019	0.0199	0.1071	0.011
Absorptive capacity Nyandarua	33	-0.0576	0.2164	0.0487	0.0109	0.0625	0.004
Absorptive capacity Narok	31	-0.1525	0.6227	0.0587	0.0255	0.1419	0.02
Adaptive resilience indices							
Adaptive Typical Nyandarua	27	-0.163	0.149	0.004	0.018	0.095	0.009
Adaptive Typical Narok	29	0.088	0.588	0.216	0.02	0.105	0.011
Adaptive Entrepreneurial Nyandarua	33	0.14	0.54	0.273	0.016	0.09	0.008
Adaptive Entrepreneurial Narok	31	0.14	0.617	0.347	0.023	0.128	0.016
Transformative resilience indices							
Transformative typical Nyandarua	27	-0.0621	0.652	0.331	0.0428	0.2227	0.05
Transformative typical Narok	29	0.0622	0.7228	0.4134	0.0405	0.2181	0.048
Transformative entrepreneurial Nyandarua	33	0.039	0.8112	0.4566	0.043	0.2471	0.061
Transformative entrepreneurial Narok	31	-0.0228	0.9275	0.2481	0.0438	0.2438	0.059
Overall resilience indices							
Resilience typical Nyandarua	27	-0.0599	0.2738	0.1199	0.0181	0.0938	0.009
Resilience typical Narok	29	0.1528	0.5086	0.277	0.0139	0.0748	0.006
Resilience Entrepreneurial Nyandarua	33	0.0752	0.4172	0.2594	0.0156	0.0898	0.008
Resilience Entrepreneurial Narok	31	0.1044	0.3938	0.218	0.0141	0.0783	0.006

Mean comparison of absorptive capacities between typical and entrepreneurial farms in Nyandarua indicated unequal variances assumed through Levene test (F=10.167, p=0.002) whereas t-test (p value =0.076 and 0.061, is greater than 0.05) indicated no significant difference in absorptive capacity. In Narok-Bomet county, levene's test (F = 0.252, p =0.618) indicated equal variance not assumed whereas t-test (t = 4.387 and 4.428, p = .000) revealed entrepreneurial farms had significantly higher absorptive capacity than typical farms.

Mean comparison of adaptive capacities in Nyandarua showed heterogeinity of variances (F=0.327, P=0.569) and a highly significant mean difference between entrepreneurial and typical farms (p =0.000 which is less than 0.05) with entrepreneurial farmers portraying greater adaptive capacity. Similarly, the farms in Narok-Bomet county demonstrated unequal variances whereas t-test (p value =0.000) revealed entrepreneurial farms demonstrated significant higher adaptive capacity than typical farms.

Mean comparison of transformative capacities in Nyandarua confirmed homogeneity of variances through Levene's tests validating equal variances whereas the t-test indicated entrepreneurial farms had significantly higher transformative capacity than typical farms. In Narok-Bomet County, Levens's test (F = 0.114, p = .737) validated equal variances and the t-test (t = 3.891, p < .001) revealed entrepreneurial farms had significant higher transformative capacity than typical farms.

Mean comparison of the farms overall resilience capacity in Nyandarua confirmed equal variances (F = 0.088, p = .767) assumed while t-test (p = .000) revealed entrepreneurial farms demonstrated slightly higher resilience capacity than typical farms. Contrary to these, mean comparison of overall resilience score in Narok-Bomet county indicated homogeneity of variances (F = 0.226, p = .636) and significant difference of overall resilience capacity between typical and entrepreneurial farms (p = .004) from independent sample t-test,

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Table 6

Mean Comparison of Typical Versus Entrepreneurial Farms in Nyandarua and Narok-Bomet Counties

Mean Comparison Typical Versus Entrepreneurial										
Absorptive capacity										
		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% Confidence Interval of the Difference**	
									Lower	**Upper**
Nyandarua	Equal variances assumed	10.167	0.002	-1.808	58	0.076	-0.0241	0.0133	-0.0507	0.0026
	Equal variances not assumed			-1.917	49.924	0.061	-0.0241	0.0125	-0.0493	0.0012
Narok	Equal variances assumed	0.252	0.618	4.387	58	0	0.1432	0.0326	0.0778	0.2085
	Equal variances not assumed			4.428	55.583	0	0.1432	0.0323	0.0784	0.2079
Adaptive Capacity										
									Lower	Upper
Nyandarua	Equal variances assumed	0.327	0.569	-11.198	58	0	-0.269	0.024	-0.3171	-0.2209
	Equal variances not assumed			-11.138	54.424	0	-0.269	0.0242	-0.3174	-0.2206
Narok	Equal variances assumed	2.543	0.116	-4.325	58	0	-0.1317	0.0304	-0.1926	-0.0707
	Equal variances not assumed			-4.353	57.075	0	-0.1317	0.0302	-0.1922	-0.0711
Transformative capacity										
Nyandarua	Equal variances assumed	0.709	0.403	-2.159	58	0.035	-0.1304	0.0604	-0.2512	-0.0095
	Equal variances not assumed			-2.18	58.849	0.033	-0.1304	0.0598	-0.25	-0.0107
Narok	Equal variances assumed	0.337	0.564	2.762	58	0.008	0.1653	0.0599	0.0455	0.2851
	Equal variances not assumed			2.772	57.891	0.007	0.1653	0.0596	0.0459	0.2847
Overall resilience capacity										
Nyandarua	Equal variances assumed	0.088	0.767	-5.87	58	0	-0.1396	0.0238	-0.1872	-0.092
	Equal variances not assumed			-5.844	54.646	0	-0.1396	0.0239	-0.1874	-0.0917
Narok	Equal variances assumed	0.226	0.636	2.976	58	0.004	0.0589	0.0198	0.0193	0.0986
	Equal variances not assumed			2.981	57.973	0.004	0.0589	0.0198	0.0194	0.0985

The below average resilience index have been reported by studies by Tambo (2016) who reported a less than 0.5 score among both innovators and non-innovators emphasizing the high vulnerability among smallholder dairy farming systems in sub-Saharan Africa. In another study, Frankenberger et al. (2014) findings illustrated indicators for transformative capacities such as good governance, social protection systems and market access are key to building resilient communities. This was further emphasized by Asmamaw et al. (2017) whose studies reiterated the significance of access to basic public services and active participation in governance structure enhance absorptive, adaptive and transformative resilience capacities. Larger landholdings and livestock ownerships are associated with diversified livelihoods, which are key to stronger resilience outcomes (Debie & Ayele, 2023).

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Findings of the study established that resilience capacities among the smallholder farms regardless of their stages in the dairy growth and whether typical and entrepreneurial remain low although entrepreneurial farms had statistically higher resilience scores than typical farms. Transformative resilience capacity was relatively higher than both the absorptive and adaptive capacities. Land, livestock assets, on farm resources, equipment, market and veterinary services and road networks were consistently strong positive indicators for the three-resilience frameworks whereas financial access and social networks remained underutilized pointing at the systemic gaps in institutional integration, financial support and human capital development. Stronger transformative capacities were demonstrated among the entrepreneurial farms but they were constrained by weak adaptive and absorptive resilience. Multifaceted intervention aimed at strengthening both tangible assets and intangible social and institutional resources are therefore key to building stronger resilient households.

5.2 Recommendations

Building absorptive and adaptive capacities through strategic investment on social capital, financial access and strengthening cooperative networks are recommended as priorities to improve the resilience capacities of the dairy systems. Training and capacity strengthening aimed at enhancing technical and managerial skills would largely contribute to long-term resilience. Extended and inclusive integration of institutional support, credit and advisory frameworks will generate resilient and sustainable dairy producer systems.

REFERENCES

Asmamaw, M., Mereta, S. T., & Ambelu, A. (2019). Exploring households' resilience to climate change-induced shocks using Climate Resilience Index in Dinki watershed, central highlands of Ethiopia. *PLOS ONE, 14*(7), e0219393. https://doi.org/10.1371/journal.pone.0219393

Asmamaw, M., Mereta, S. T., & Terefe, Y. (2017). Building community resilience to climate change: An approach for transforming development. *Environmental Systems Research, 6*(1), 1–11. https://doi.org/10.1186/s40068-017-0083-1

Bahta, Y. T., & Lombard, W. A. (2023). Nexus between social vulnerability and resilience to agricultural drought amongst South African smallholder livestock households. *Atmosphere, 14*(5), 900.

Bebe, B. O., Rademaker, C. J., van der Lee, J., Kilelu, C. W., & Tonui, C. (2017). Sustainable growth of the Kenyan dairy sector: A quick scan of robustness, reliability and resilience: Executive summary (No. 1021). Wageningen Livestock Research.

Bec, A., McLennan, C. L., & Moyle, B. D. (2016). Community resilience to long-term tourism decline and rejuvenation: A literature review and conceptual model. *Current Issues in Tourism, 19*(5), 431–457.

Bengtsson, C., Thomasen, J. R., Kargo, M., Bouquet, A., & Slagboom, M. (2022). Emphasis on resilience in dairy cattle breeding: Possibilities and consequences. *Journal of Dairy Science, 105*(9), 7588–7599.

Berkes, F., & Ross, H. (2016). Panarchy and community resilience: Sustainability science and policy implications. *Environmental Science & Policy, 61*, 185–193.

Boka, G. T., & John, C. (2017). Climate change challenges, smallholder commercialization and progress out poverty in Ethiopia. *Working Paper Series* (253).

Burke, W. J., & Jayne, T. S. (2010). Spatial disadvantages or spatial poverty traps: Household evidence from rural Kenya (International Development Working Paper No. 54560). Michigan State University, Department of Agricultural, Food, and Resource Economics. https://doi.org/10.22004/ag.econ.54560

Cafer, A., Green, J., & Goreham, G. (2022). A community resilience framework for community development practitioners building equity and adaptive capacity. In *Community development for times of crisis* (pp. 56–74). Routledge.

Cinner, J. E., & Barnes, M. L. (2019). Social dimensions of resilience in social-ecological systems. *One Earth, 1*(1), 51–56.

Cochrane, L., & Cafer, A. (2018). Does diversification enhance community resilience? A critical perspective. *Resilience, 6*(2), 129–143.

Coquil, X., Béguin, P., & Dedieu, B. (2014). Transition to self-sufficient mixed crop–dairy farming systems. *Renewable Agriculture and Food Systems, 29*(3), 195–205.

Cumming, G. S., Morrison, T. H., & Hughes, T. P. (2017). New directions for understanding the spatial resilience of social–ecological systems. *Ecosystems, 20*(4), 649–664.

Licensed Under Creative Commons Attribution (CC BY-NC)

Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change, 18*(4), 598–606.

Dardonville, M., Urruty, N., Bockstaller, C., & Therond, O. (2020). Influence of diversity and intensification level on vulnerability, resilience and robustness of agricultural systems. *Agricultural Systems, 184*, 102913.

Darnhofer, I. (2021). Farming resilience: From maintaining states towards shaping transformative change processes. *Sustainability, 13*(6), 3387.

Debie, E., & Ayele, A. W. (2023). Perceived determinants of smallholder households' resilience to livelihood insecurity in Goncha District, Northwest highlands of Ethiopia. *Sage Open, 13*(3), 21582440231184861.

Duranovich, F., Shadbolt, N. M., Dooley, A. E., & Gray, D. I. (2015, June). Dairy farm owners, their resilience attributes, and how they relate to their perception and management of risk. In *Proceedings of the Paper Presented at the Scientific Research Symposium of the 25th World Conference of the International Food & Agribusiness Management Association (IFAMA), St. Paul, MI, USA* (pp. 14-15).

Egamberdiev, B. (2024). Social capital effects on resilience to food insecurity: Evidence from Kyrgyzstan. *Journal of International Development, 36*(1), 435–450.

Feye, G. L. (2018). Perceptions and governance of food insecurity risks among family farmers in Southwestern Ethiopia [Doctoral dissertation, Universitäts-und Landesbibliothek Bonn].

Folke, C., Carpenter, S., Walker, B., Scheffer, M., Chapin, T., & Rockström, J. (2010). Resilience thinking: Integrating resilience, adaptability and transformability. *Ecology and Society, 15*(4), Article 20.

Frankenberger, T., Choularton, R., Kurtz, J., & Nelson, S. (2015). Measuring shocks and stressors as part of resilience measurement. *Food Security Information Network. Resilience Measurement Technical Working Group Technical Series No. 5*. Rome, Italy.

Frankenberger, T., Constas, M., Nelson, S., & Starr, L. (2014). Resilience programming among nongovernmental organizations: Lessons for policy makers. USAID. https://www.usaid.gov/resilience

Gbetibouo, G. A., Hassan, R. M., & Ringler, C. (2010). Modelling farmers' adaptation strategies for climate change and variability: The case of the Limpopo Basin, South Africa. *Agrekon, 49*(2), 217–234.

Grafton, R. Q., Doyen, L., Béné, C., Borgomeo, E., Brooks, K., Chu, L., Cumming, G. S., Dixon, J., Dovers, S., Garrick, D., Helfgott, A., Jiang, Q., Katic, P., Kompas, T., Little, L. R., Matthews, N., Ringler, C., Squires, D., Steinshamn, S. I., ... Wyrwoll, P. R. (2019). Realizing resilience for decision-making. *Nature Sustainability, 2*(10), 907–913. https://doi.org/10.1038/s41893-019-0376-1

Haider, L. J., & Cleaver, F. (2023). Capacities for resilience: Persisting, adapting and transforming through bricolage. *Ecosystems and People, 19*(1), 2240434.

Hassn, M. M., & Akkermans, L. (2022). Adaptive capacity of dairy farmers in Ziway-Shashemene milkshed, Ethiopia. *Advances, 3*(1), 5–10.

Kassie, M., Teklewold, H., Marenya, P., Jaleta, M., & Erenstein, O. (2015). Production risks and food security under alternative technology choices in Malawi: Application of a multinomial endogenous switching regression. *Journal of Agricultural Economics, 66*(3), 640–659.

Khan, N., Yaqoob, I., Hashem, I. A. T., Inayat, Z., Mahmoud Ali, W. K., Alam, M., ... & Gani, A. (2014). Big data: Survey, technologies, opportunities, and challenges. *The Scientific World Journal, 2014*(1), 712826.

Knickel, K., Redman, M., Darnhofer, I., Ashkenazy, A., Chebach, T. C., Šūmane, S., & Rogge, E. (2018). Between aspirations and reality: Making farming, food systems and rural areas more resilient, sustainable and equitable. *Journal of Rural Studies, 59*, 197–210.

Kruse, S., & Pütz, M. (2014). Adaptive capacities of spatial planning in the context of climate change in the European Alps. *European Planning Studies, 22*(12), 2620–2638.

Levine, S. (2014). Assessing resilience: Why quantification misses the point. *Humanitarian Policy Group Working Paper, ODI*, London.

Maltou, R., & Bahta, Y. T. (2019). Factors influencing the resilience of smallholder livestock farmers to agricultural drought in South Africa: Implication for adaptive capabilities. *Jàmbá: Journal of Disaster Risk Studies, 11*(1), 1–7.

Marshal, M. P., Burton, C. M., Chisolm, D. J., Sucato, G. S., & Friedman, M. S. (2013). Cross-sectional evidence for a stress-negative affect pathway to substance use among sexual minority girls. *Clinical and Translational Science, 6*(4), 321–322.

Maru, L., & Chemjor, R. (2013). Microfinance interventions and empowerment of women entrepreneurs rural constituencies in Kenya. *Research Journal of Finance and Accounting, 4*(9), 84–95.

Mendoza, T. C., Furoc-Paelmo, R., Makahiya, H. A., & Mendoza, B. C. (2019). Strategies for scaling up the adoption of organic farming towards building climate change resilient communities. In *Global climate change and environmental policy: Agriculture perspectives* (pp. 125–146). Springer Nature Singapore.

Licensed Under Creative Commons Attribution (CC BY-NC)

Meuwissen, M. P., Feindt, P. H., Spiegel, A., Termeer, C. J., Mathijs, E., De Mey, Y., ... & Reidsma, P. (2019). A framework to assess the resilience of farming systems. *Agricultural Systems, 176*, 102656.

Mizik, T. (2021). Climate-smart agriculture on small-scale farms: A systematic literature review. *Agronomy, 11*(6), 1096.

Nettle, R., Ayre, M., Beilin, R., Waller, S., Turner, L., Hall, A., Irvine, L., & Taylor, G. (2015). Empowering farmers for increased resilience in uncertain times. *Animal Production Science, 55*(7), 843–855. https://doi.org/10.1071/AN14882

Noriega, I. L., Dawson, I. K., Vernooy, R., Köhler-Rollefson, I., & Halewood, M. (2017). Agricultural diversification as an adaptation strategy. *Agriculture for Development, 30*, 25–28.

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology, 41*(1–2), 127–150.

O'Brien, K. (2012). Global environmental change II: From adaptation to deliberate transformation. *Progress in Human Geography, 36*(5), 667–676.

Odero-Waitituh, J. A. (2017). Dairy farming in Kenya: Resource constraints and opportunities. *International Journal of Livestock Production, 8*(2), 1–10. https://lrrd.cipav.org.co/lrrd29/7/atiw29139.html

Oloo, J. O., & Omondi, P. (2017). Strengthening local institutions as avenues for climate change resilience. *International Journal of Disaster Resilience in the Built Environment, 8*(5), 573–588.

Ortiz, R., & Peris, J. (2022). The role of farmers' umbrella organizations in building transformative capacity around grassroots innovations in rural agri-food systems in Guatemala. *Sustainability, 14*(5), 2695.

Osumba, J. J., Recha, J. W., & Oroma, G. W. (2021). Transforming agricultural extension service delivery through innovative bottom–up climate-resilient agribusiness farmer field schools. *Sustainability, 13*(7), 3938.

Peng, L., Tan, J., Deng, W., & Liu, Y. (2020). Farmers' participation in community-based disaster management: The role of trust, place attachment and self-efficacy. *International Journal of Disaster Risk Reduction, 51*, 101895.

Perin, L., San Cristobal, M., Milestad, R., & Martin, G. (2020). Identification of resilience factors of organic dairy cattle farms. *Agricultural Systems, 183*, 102875.

Rademaker, C. J., Bebe, B. O., Van Der Lee, J., Kilelu, C., & Tonui, C. (2016). Sustainable growth of the Kenyan dairy sector: A quick scan of robustness, reliability and resilience. *Report 3R Kenya/WLR No. 979*; 66 pp. Wageningen Livestock Research.

Ramilan, T., Kumar, S., Haileslassie, A., Craufurd, P., Scrimgeour, F., Kattarkandi, B., & Whitbread, A. (2022). Quantifying farm household resilience and the implications of livelihood heterogeneity in the semi-arid tropics of India. *Agriculture, 12*(4), 466.

Ross, H., Haque, C. E., & Berkes, F. (2024). Transmission of knowledge and social learning for disaster risk reduction and building resilience: A Delphi study. *Sustainable Development, 32*(2), 1525–1537.

Rudberg, P. M., & Karpouzoglou, T. (2022). Using adaptive capacity to shift absorptive capacity: A framework of water reallocation in highly modified rivers. *Water, 14*(2), 193.

Shadbolt, N., Olubode-Awosola, F., & Rutsito, B. (2017). Resilience in dairy farm businesses; to 'bounce without breaking'. *Journal of Advances in Agriculture, 7*(3), 1138–1150.

Shittu, E., Parker, G., & Mock, N. (2018). Improving communication resilience for effective disaster relief operations. *Environment Systems and Decisions, 38*(3), 379–397.

Shokri, E. (2022). Perceived adaptive capacity of New Zealand dairy farmers in the face of policy and economic volatility [Doctoral dissertation, Massey University].

Sinclair, F., Swaffield, S., & Oldfield, R. (2022). Ecosystem thresholds and learning in resilient agriculture. *Environmental Science & Policy, 132*, 111–119. https://doi.org/10.1016/j.envsci.2022.05.016

Slijper, T., Urquhart, J., Poortvliet, P. M., Soriano, B., & Meuwissen, M. P. (2022). Exploring how social capital and learning are related to the resilience of Dutch arable farmers. *Agricultural Systems, 198*, 103385.

Spiegel, A., Soriano, B., de Mey, Y., Slijper, T., Urquhart, J., Bardají, I., ... & Meuwissen, M. (2020). Risk management and its role in enhancing perceived resilience capacities of farms and farming systems in Europe. *EuroChoices, 19*(2), 45–53.

Šūmane, S., Kunda, I., Knickel, K., Strauss, A., Tisenkopfs, T., des Ios Rios, I., & Ashkenazy, A. (2018). Local and farmers' knowledge matters! How integrating informal and formal knowledge enhances sustainable and resilient agriculture. *Journal of Rural Studies, 59*, 232–241.

Taghipoor, M., Pastell, M., Martin, O., Ba, H. N., van Milgen, J., Doeschl-Wilson, A., & Muñoz-Tamayo, R. (2023). Animal board invited review: Quantification of resilience in farm animals. *Animal, 17*(9), 100925.

Tambo, J. A. (2016). Adaptation and resilience to climate change and variability in north-east Ghana. *International Journal of Disaster Risk Reduction, 17*, 85–94.

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Tambo, J. A., & Wünscher, T. (2017). Enhancing resilience to climate shocks through farmer innovation: Evidence from northern Ghana. *Regional Environmental Change, 17*(5), 1505–1514.

Tesso, G., Emana, B., & Ketema, M. (2012). Analysis of vulnerability and resilience to climate change induced shocks in North Shewa, Ethiopia. *Agricultural Sciences, 3*(6), 871.

Tiwari, S., Amin, F., & Gupta, A. K. (2023, November). Blending indigenous and scientific knowledge for effective risk reduction. In *International Conference on Advances in Health, Safety, Fire, Environment, Allied Sciences and Sustainability* (pp. 301–317). Springer Nature Singapore.

Tofu, D. A., Dilbato, T., Fana, C., Dirbaba, N. B., & Tesso, G. (2025). Analysis of vulnerability, its drivers, and strategies applied towards reducing the pastoral and agro-pastoral livelihood vulnerability to climatic shocks. *Scientific Reports, 15*(1), 2567.

Urruty, N., Tailliez-Lefebvre, D., & Huyghe, C. (2016). Stability, robustness, vulnerability and resilience of agricultural systems. A review. *Agronomy for Sustainable Development, 36*(1), 15.

Van der Lee, J., Kangogo, D., Gülzari, Ş. Ö., Dentoni, D., Oosting, S., Bijman, J., & Klerkx, L. (2022). Theoretical positions and approaches to resilience assessment in farming systems. A review. *Agronomy for Sustainable Development, 42*(2), 27.

Weldegebriel, Z. B., & Amphune, B. E. (2017). Livelihood resilience in the face of recurring floods: An empirical evidence from Northwest Ethiopia. *Geoenvironmental Disasters, 4*, 1–19.

Williams, T. G., Guikema, S. D., Brown, D. G., & Agrawal, A. (2020). Resilience and equity: Quantifying the distributional effects of resilience-enhancing strategies in a smallholder agricultural system. *Agricultural Systems, 182*, 102832.

Wolfram, M., Borgström, S., & Farrelly, M. (2019). Urban transformative capacity: From concept to practice. *Ambio, 48*(5), 437–448. https://doi.org/10.1007/s13280-019-01169-y

Zseleczky, L., & Yosef, S. (2014). Are shocks really increasing? A selective review of the global frequency, severity, scope, and impact of five types of shocks (IFPRI Conference Paper No. 5). International Food Policy Research Institute.

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The influence of artificial intelligence on improving tax collection in Zanzibar Revenue Authority

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ABSTRACT

This research was conducted to explore the impact of Artificial Intelligence (AI) on improving tax collection practices within the tax collection agency known as the Zanzibar Revenue Authority (ZRA). The study aligned with two specific objectives: first, to assess employees' perceptions of AI on improving tax collection at ZRA, and the second objective is to examine the role of AI in tax fraud detection on improving tax collection at ZRA. The study employed a quantitative research methodology with a cross-section research design. The Technological Acceptance Model (TAM) was the model which was used to support this study. The target population was 373 employees who are engaged in tax collection practices, with a sample size of 193, which was obtained through Yamane's formula, and the proportionate stratified sampling strategies are used to select the participants. Closed-ended questionnaires were used to collect primary data. Data analysis was performed using descriptive and inferential statistics through multiple linear regression analysis. The results showed that there is a positive relationship between the employees' perception and improved tax collection ($r=0.827$, $p<0.1$). This strong positive perception indicates a readiness and supportive environment to implement AI in tax administration, which can help to streamline processes and increase operational efficiency. The results also showed that there is a positive relationship between the AI role in tax fraud detection and improved tax collection ($r=0.849$, $p<0.1$). This indicates that AI has the potential to increase revenue and help the taxpayers to comply with tax regulations effectively. Since ZRA employees perceived AI as useful tools to improve tax collection, they are ready to support it. It is recommended that ZRA urgently needs to invest in AI to help improve revenue performance; this investment will require a robust digital infrastructure with strong data security and privacy measures while adopting a phased implementation strategy. To avoid failure, it is advisable to start with pilot projects while carefully selecting suitable AI technologies for successful integration with existing systems.

Keywords: Artificial Intelligence, Tax Fraud Detection, Tax Collection, Zanzibar Revenue Authority

I. INTRODUCTION

Information and Communication Technology (ICT) has become an integral part of global governance and economic systems; it plays a key role in transforming traditional processes across sectors towards digital technology(Umar et al., 2023). ICT tools, which are used in tax collection having a great potential to improve revenue collection worldwide by streamlining processes and increasing efficiency (Blume & Bott, 2021). Effective tax collection is significant for financing social development and strengthening respectable governance.

The widespread use of ICT services has led to the emergence of advanced digital technologies in revenue growth that have significantly affected business and economic activities (Umar et al., 2023). Digital technologies such as Artificial Intelligence (AI) are bringing new innovations that tax authorities must integrate their tax collection systems with such technologies to remain competitive and strengthen their revenue collection (Junquera et al., 2022). According to the report from United Nations Educational Scientific and Cultural Organization (UNESCO, 2022), it is recognized that the use of AI in tax collection is rapidly increasing in all countries around the world. Many governments see AI as an important tool to improve the competitiveness of their countries and stimulate economic growth. The World Bank (2024) predicts that AI could add $13 trillion to the global economy by 2030. Currently, more than 50 governments around the world have already developed strategies to implement AI in tax collection and improve their tax services.

AI is essential to boost tax compliance and business process. It helps tax authorities to control revenue leakage, streamline processes, detect fraud, tax evasion, and allocate resources more efficiently (Nembe et al., 2024). AI also helps improve compliance by ensuring accurate data collection from transactions and assisting tax agents in collecting the exact taxes. The U.S. Internal Revenue Service (IRS) has invested in new technologies and integrated AI into its internal operating systems. As of 2019, reports indicate that the IRS had recovered nearly $10 Billion in underpaid taxes through the effective use of AI (Caroline & Collin, 2024). However, deploying AI to improve tax administration comes with many risks including unethical use, lack of transparency, and potential violations of taxpayer privacy and data security (Shark, 2022).

The Boston Consulting Group (BCG) Foundation in 2018 reported that Australia has successfully leveraged

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advanced AI technologies, such as machine learning and natural language processing to improve tax collection. The Australian Taxation Office (ATO) recovered over $530 million in late taxes and prevented $2.5 billion in fraudulent claims (Bentley, 2022). These AI systems have helped the ATO analyses large amounts of data, identify patterns of non-compliance, prevent fraud, and improve the efficiency and integrity of its tax collection system. Despite significant advances in AI-based tax collection worldwide, many African countries have yet to adopt AI technology in central government revenue collection (Moore et al., 2018). For example, the Nigerian's revenue collection agency hesitates to fully embrace this technology, which has hindered the country's revenue and value-added tax (VAT) revenue collection.

During the COVID-19 pandemic, the implementation of AI has been identified as having the potential to enhance tax collection and reduce system downtime resulting to less human interaction (Bala et al., 2022); this is because AI allows for automated tax collection and administration without human intervention. The effectiveness of the use of AI and other technologies in revenue means that AI can be a valuable resource for African governments in finding better ways to increase their revenue (Adegboye et al., 2022). It is suggested that the adoption of technology, especially AI, offers significant opportunities for African economic growth; especially when all the challenges associated with AI technology in tax collection are addressed. These include issues such as lack of internet facilities, expertise, security, lack of trust and many others (Gwagwa et al., 2020). Effective management of these challenges can stimulate economic growth and development of the community and the nation as a whole.

Kenya has successfully grown its economy with the help of AI and has been an active participant in the Fourth Industrial Revolution (4IR). For example, in Kenya's Revenue Collection, there are 49 AI applications, covering 15 sectors, including finance, education, trade and security (Akello, 2022). However, despite the full adoption of AI systems, there are still many challenges facing the revenue collection system (Rubab, 2023). These challenges include skills gaps, regulatory environment, connectivity issues, insufficient investment in research, and lack of data due to poorly trained algorithms that use inaccurate and unreliable data, leading to wrong results.

Tanzania has made significant progress in the effective use of ICT, ranking 26th in the world and second in Africa after Mauritius, reflecting its progress in the field of ICT (Adam, 2019). In terms of tax collection, the Tanzania Revenue Authority (TRA) and the Zanzibar Revenue Authority (ZRA) have implemented digital systems that have significantly increased tax revenue. For example, ZRA revenue increased from 565.89 billion in the 2022/2023 financial year to 675.601 billion in 2023/2024, indicating an increase of 106.39% (ZRA, 2024). In this regard, the Tanzania Five Year Development Plan (FYDP) III recognizes the presence and potential of new artificial intelligence (AI) technologies on improving tax collection, although the plan has not prepared a detailed implementation strategy to incorporate these technologies (Osakwe, 2023). This suggests that there is a need for more targeted strategies to encourage the adoption of AI in countries like Tanzania. As revenue agencies around the world are using AI models to address tax collection challenges, the researcher explored how AI could help the Zanzibar Revenue Authority (ZRA) improve its tax collection efforts.

1.1 Statement of the Problem

The Zanzibar Revenue Authority (ZRA) aims to improve its taxpayer service and tax collection processes through the integration of technological innovations (ZRA, 2020). The technology to be used is intended to increase overall revenue by reducing errors and improving the organization's business processes and facilitating better service to its taxpayers, such services include online registration, online filing and online payments. Artificial Intelligence (AI) can therefore be used to support better tax administration because it can improve revenue collection, automate tedious tasks, and monitor taxpayer compliance (Dreisbach, 2019).

However, only a small portion of ZRA's business operations is currently automated in tax collection, which leads to inaccurate data entry, lack of robust analytical capabilities, and outdated technology. These constraints prevent revenue loss as well as operational efficiency(Mendoza et al., 2020). The current situation of ZRA resulting from the lack of critical resources has become an obstacle for ZRA to take advantage of the capabilities of AI to significantly improve the efficiency and effectiveness of its business processes. The reliance on human processes and poor data analysis highlights the need for technological innovation, especially through AI, which is used to enhance tax collection and improve operations (Kumar et al., 2022).

1.2 Research Objectives

i. To assess employee perception of AI implementation on improving tax collection at ZRA.
ii. To examine the AI roles in tax fraud detection on improving tax collection at ZRA.

II. LITERATURE REVIEW

2.1 Theoretical Review

The Technological Acceptance Model provides support and make it easier to understand how people perceive, accept, and use any new technology that has emerged, along with showing the impact on its use (Momani, 2020). Fred

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Davis developed the Technology Acceptance Model (TAM) in 1989. The model is an important model that helps people understand and cope with the use of technology, especially in strategic level. There are two factors that the TAM model considers including: Perceive Ease of Use (PEOU), which measures how useful the system is to users, and Perceived Usefulness (PU), which refers to the belief that the system will improve work performance(Davis, 1993). Based on this study, ZRA employees' opinions on the use of technology and ease of use have a significant impact on how the AI system will be used in their daily work.

Based on the findings of this study, which strongly support the theoretical assumptions discussed earlier. ZRA staff appears to have a generally positive attitude towards implementing AI in tax collection. The majority of respondents not only demonstrated a clear understanding of AI but also expressed their acceptance of AI's potential to enhance revenue performance and enhance tax compliance. This is clearly consistent with the Technology Acceptance Model (TAM), which suggests that individuals are willing to adopt and integrate a system into their daily work when they find it useful. The results also support the relevance of TAM based on second specific objective which shows the role of AI in tax fraud detection. Respondents agreed that AI represents an effective tool for detecting fraudulent activities within the tax system. These results demonstrate the effectiveness and usefulness of AI in revenue management within tax authority.

2.2 Empirical Review

2.2.1 Employees' Perceptions of Implementing Artificial Intelligence

A study conducted by Kunene(2021) in South Africa, which used a qualitative approach with sample size of 100 participants, the study found that operational managers and tax collection officers involved in tax collection department perceived AI as useful tool to improve revenue and speed up the tax collection process. This finding is in line with a study by Aggarwal (2024) which found that 85% of tax professionals agreed that AI speeds up the tax collection process, which leads to improve revenue.

However, the study of Mpofu (2024) using quantitative method which is conducted in South Africa on the Impact of Digital Transformation in Taxation. The result found that most of respondents view AI as helpful for simplifying work and promote tax compliance. But still some of employees are hesitated to accept the digital change due to fear of losing their jobs, insufficient resources as well as lack of awareness based on digital transformation campaign. Similar study with Oliveira et al. (2014) in Brazil whose findings depicted that AI was useful for assessment of risk and auditing. While Tayarani (2021) in India contradicts with other scholars since he found that AI was not successfully especial in complex scenario of tax collection, since its investments depends on high requirements.

Additionally, Puspita et al. (2024) study on Taxing Artificial Intelligence in Malaysia, using quantitative research approach with total sample size of 197 tax collectors. The results showed that some of tax collectors do not have deep understanding on AI technology; this is due to incomplete or non-existent regulation that addresses the proper use of AI in tax matters. Therefore, there is a great role to encourage the proper usage of AI in accordance with administrative regulations to bring more benefits and efficiency to the tax collection process.

2.2.2 The Role of AI in Tax Fraud detection on Improving Tax Collection

In contrast, academic studies highlight the role of AI in detecting tax fraud to improve tax collection. For example, (Murorunkwere et al., 2023) whose study conducted in Rwanda found that there is a significant relationship between the role of AI in detecting tax fraud and improving tax collection, this indicated that the use of AI tools through a controlled machine learning helped to identify tax evaders and improve revenue. Similarly, Yalamati (2023) supports Murorunkwere et.al (2023) findings by suggesting that AI tools such as machine learning increase the efficiency of work and assisting tax authorities in combating fraud and preserving the integrity of the tax system.

AI tools such as machine learning, neural networks and data mining helped to increase the efficiency of the tax collection system and detect tax fraud in a timely manner. According to the study by Nuryani et al. (2024) using one of the aforementioned AI tools, the revenue authority can improve its services and increase revenue. Although AI has many advantages, other studies show its disadvantages. For example, Oluwabusayo et al. (2024) found that human presence and supervision are important because AI often fails to identify new fraud and complex scenarios of taxation.

Also, according to Abkar and Chaihab (2024), it has been found that AI lacks transparency and error detection which leads to eroding taxpayer confidence. Despite the various benefits and challenges described by previous researchers, there is still a significant gap in understanding the impact of AI on tax collection management. This has prompted the researcher to see the need to conduct research on the potential of AI in increasing revenue. The study mainly focused on examining employee perceptions and the role of AI in detecting tax fraud. The researcher aimed to provide insight into the impact of AI, as well as prepare tax authorities to adopt their business processes with AI to improve collection processes.

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III. METHODOLOGY

This study was used a quantitative research method based on a cross-sectional design where this design was chosen to capture data simultaneously and establish cause and effect relationships regarding the influence of AI on improving tax collection. The study was taken at Zanzibar Revenue Authority comprising a sample size of 193 respondents from the population of 373 employees using Yamane's formula. Through stratified sampling strategies, the researcher chose this way to ensure equal representation. Structured questionnaires using Likert scale point were used to capture primary data. Whereas validity of the factor analysis using Keiser Meyer Olkin (KMO) provides value greater than 0.80 indicates the acceptance of research instrument, while reliability tests using Cronbach's Alpha generated values greater than 0.87, indicating good internal consistency. Primary data collected were analyses in SPSS v25 using descriptive statistics which help to summarize findings and inferential statistics to test statistical significance of the findings by using multiple regression analysis. Ethics in this study were considered by obtaining permission to collect data from the Revolutionary Government of Zanzibar because ZRA is a government institution along with a consent letter for maintaining anonymity and confidentiality, to ensure integrity and honesty throughout the research process.

IV. FINDINGS & DISCUSSION

4.1 Demographic Information

The following items are considered in this study; age of respondents, gender of respondents, job title, work experience and education level of respondents as shown in Table 1 below.

Table 1

Demographic Information

Items	Category	F	%	Items	Category	F	%
Age	18-25	26	13.5	Experience	less than 1 year	26	13.5
	26-35	107	55.4		1-3 years	87	45.1
	36-45	45	23.3		4-7 years	44	22.8
	46-55	14	7.3		8-10 years	7	3.6
	56 and above	1	0.5		more than 10 years	29	15
Gender	Male	102	52.8	Education level	Diploma	29	15
	Female	91	47.2		Bachelor's degree	120	62.2
Title	Manager	26	13.5		Master's degree	42	21.8
	Operation staff	167	86.5		Other	2	1

Based on the results of the demographic profile of the respondents, the demographic profile directly matches the objective of this study which is to assess the employees' perception of AI towards improving tax collection at ZRA. A large number of young people (56%) between the ages of 26-35 years showed readiness for technological change, while 86.5% of the respondents are employees directly involved in tax collection. In addition, the education level of the respondents shows their high ability to evaluate and accept the potential of AI. According to Maan et.al (2020), these characteristics provide valuable insight by strengthen their perceptions and support the objective of the study.

4.2 Descriptive Statistics for Employees' perceptions

The researcher aimed to assess employees' perceptions toward Artificial Intelligence. The findings presented in Table 2 shows the employees' views regarding the integration of AI within the ZRA, particularly in the area of tax collection.

Table 2

Employees' Perceptions of AI Adoption at ZRA

Factor	Percent	Interpretation
Awareness of AI in tax collection	76.2%	High level of awareness of AI use cases within ZRA
Ease of use (perceived)	81.9%	Strong agreement that AI implementation would help improve tax collection
Usefulness (perceived)	66.8%	Moderate confidence in usability of AI-based systems
Data security confidence	69.4%	Confidence that AI can protect taxpayers' information
Trust in AI systems	78.8%	Strong support for adopting AI at ZRA

As shown in Table 2, the following factors were used to assess how employee's perception could contribute to improve tax collections: awareness, ease of use, usefulness, data security, and trust in AI systems. The awareness of AI in tax collection holds 76.2% of respondents, which indicates a high level of understanding of AI. From the ease-of-use perspective, 81.9% of respondents strongly agreed that the implementation of AI would help ZRA to improve tax

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collection. Regarding the usefulness of AI-based tax collection systems, 66.8% expressed moderate confidence in the usability of the system. For data security and to protect taxpayers' information, 69.4% expressed confidence in AI. In the aspect of trust,78.8% of respondents showed great support and belief in the AI adoption at ZRA.

These findings conclude that most respondents have positive views towards the adoption of AI to improve the tax collection process, which provides a supportive environment for ZRA. These findings, supported by Mpofu (2024) in South Africa, depicted that employees perceive AI as helpful in simplifying work and boosting tax collection. Nevertheless, the findings contradicted the study by Puspita et al. (2024) in Malaysia, whose findings depicted that most tax professionals lack a good understanding on the implications of AI technology in tax administration. This situation underscores the need for increasing awareness campaigns on AI adoption in tax collection processes through various activities such as seminars, workshops, and in-house training, especially for IT and business operational professionals.

4.3 Descriptive Statistics for AI's Role in Detecting Tax Fraud

The researcher aimed to investigate how the Artificial Intelligence can be used in detecting tax fraud. The findings presented in Table 3 shows the perception on AI regarding the tax fraud detection within the ZRA.

Table 3

Perceptions of AI Capabilities for Fraud Detection and Monitoring

Factor	Percent	Interpretation
Data quality requirement	79.3%	Agreement that AI relies on high-quality, accurate data to detect fraud
Anomaly detection capability	71.0%	Agreement that AI can correctly detect anomalies
Real-time monitoring	76.0%	Strong agreement that AI monitors behaviors in real time to flag fraud
Instant alerts for suspicious transactions	77.2%	Agreement that AI improves compliance via instant alerts

The following factors were used to examine how AI could contribute to detect tax fraud: data quality, adaptability, anomaly detection as well as real time monitoring capabilities. According to the data, large proportions of respondents 79.3%, agreed that the artificial intelligence system relies on high-quality and accurate data for detecting tax fraud. This indicates that the respondents understand the value of data quality which is highly required in AI based system.71% of the respondents agreed that AI is capable of correctly detecting anomalies. This determines a high level of confidence in AI monitoring and detection capabilities.76% of the respondents strongly agreed that AI has tendency to monitor taxpayer behaviors in real time and quickly identify fraudulent activities. In addition, 77.2% of the respondents accept that AI can improve tax compliance by providing instant alerts on mistrustful transaction.

The findings show a generally positive perception of AI role on improving tax collection, particularly in fraud detection and compliance monitoring. Most of the respondents agreed that AI supports tax fraud detection. This findings consistent with studies by Murorunkwere et al. (2023) and Yalamati (2023) in Rwanda and Nuryani et al (2024) in Malaysia whose findings show that integrating AI model radically enhances the detection of tax fraud in the tax collection system. These technologies provide tax authorities with useful instruments to enhance tax collection and enforce tax compliance.

4.4 Descriptive Statistics for Tax Collection Improved

The researcher aimed to investigate how the tax collection is improved within the ZRA. The findings were presented in Table 4.

Table 4

Perceptions of AI's Contribution to Tax Collection Outcomes

Factor	Percent	Interpretation
Compliance rate	81.9%	Agreement that AI increases compliance through accurate assessment, reduced fraud, and stronger monitoring
Performance rate	76.2%	High acceptance and willingness to adopt AI to improve revenue performance
Cost reduction	66.8%	Moderate confidence that AI simplifies operations and lowers admin costs
Data security / detection rate	69.4%	Belief that AI ensures data security and improves fraud detection
Overall trust/support	78.8%	Strong confidence and support for AI to improve tax collection

The following factors were used to measure how AI would help ZRA to improve its revenue through the integration of AI technology within tax collection system. These factors: compliance rate, performance rate, cost reduction and detection rate.

The result showed that the use of AI has a positive impact on improving tax collection in the ZRA. A large number of respondents 81.9% agreed that AI increases compliance by improving accuracy in tax assessment, reducing fraud and strengthening compliance monitoring. Furthermore, 76.2% expressed a high level of acceptance on AI in tax

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collection, indicating a willingness to adopt AI systems that would improve performance in revenue collection. Regarding the cost reduction rate on AI-based tax collection systems, 66.8% expressed moderate confidence in their ability to simplify operations and contribute to reducing tax administration costs. In addition, 69.4% believed in AI in ensuring data security and increasing the detection rate of fraudulent activities. Overall, 78.8% expressed strong confidence and support for the use of AI technology, confirming that AI plays a key role in improving tax collection in the ZRA. This findings align with the study by Rahman et al. (2024) which confirms that innovative technologies such as AI are the key factor in supporting tax administration process by increasing tax compliance, reducing work inefficiency as well as helping to lower operational cost.

4.5 Analysis of Correlation

Correlation analysis was performed to determine how strongly the variables were associated (Franzese & Iuliano, 2018). According to Table 5, the results showed that there is a correlation between the independent variables and the dependent variable under study since r ranges from 0.714 and 0.849 at $p<0.01$.

Table 5

Inter Correlations

Variables	Employees' perceptions	AI's Role in Detecting Tax Fraud	Tax Collection Improved
Employees' perceptions	1	.737**	.827**
AI's Role in Detecting Tax Fraud	.737**	1	.849**
Tax Collection Improved	.827**	.849**	1
Number of participants	193	193	193

The correlation analysis depicted a strong and statistically significant positive relationship among the key variables examined in the study. Particularly, employees' perceptions of implementing Artificial Intelligence show a very strong positive correlation with improved tax collection ($r = .827$, $p < .01$), indicating that positive attitudes towards AI are closely linked to improved tax revenue. These results supported by Kunene (2021) who found that operational managers and tax collection officers involved in tax collection department perceived AI as a useful tool to improve revenue and speed up the tax collection process.

In addition, there is significant evidence of a strong positive correlation between improved tax collection and AI's role to detect tax fraud ($r = .849$, $p < .01$), these findings aligned with Murorunkwere et.al (2023) whose study conducted in Rwanda. This demonstrates the notable impact of AI in identifying and reducing fraudulent activities. These findings reinforce the argument that improvements in Zanzibar Revenue Authority's tax collection are driven not only by employee perceptions but also by the effectiveness of AI in identifying tax fraud (Nembe et al., 2024).

4.2 Regression Analysis

A statistical technique is employed to examine how a dependent variable responds to changes in one or more independent variables (Franzese & Iuliano, 2018). This approach not only reveals the strength and direction of each predictor's influence but also evaluates how effectively these predictors account for variations in the dependent variable. Key components of the analysis include ANOVA, which tests whether the overall relationship observed is statistically significant, and measures like R and R Square, which indicate the proportion of variance in the outcome explained by the model. Additionally, the coefficients demonstrate the specific impact of each individual predictor on the dependent variable.

4.2.1 Multiple Linear Regression Analysis

Table 6, 7 and 8 presents multiple linear analysis findings.

Table 6

Inter Correlations

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.919[a]	.845	.843	.297

Predictors: (Constant), employees' perceptions, AI's role in detecting tax fraud

The model summary shows a strong and statistically significant multiple linear regression model for predicting tax collection improvement based on the selected independent variables. The model yielded an R value of 0.919, indicating a very strong positive relationship between the actual and predicted results. The R Square value of 0.845 means that 84.5% of the variance in tax collection improvement is explained by the model; indicating high predictive power.

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The adjusted R Square is 0.843, which confirms that the model remains reliable even when accounting for the number of predictors. The model's predictions appear to be quite accurate, as indicated by the standard error of 0.297. The analysis of regression model clearly depicted that the improvement of tax collection in the Zanzibar Revenue Authority is greatly impacted by independent variables, most likely employee perceptions of AI and its effectiveness in identifying tax fraud.

Table 7

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	91.181	3	30.394	344.612	.000[b]
	Residual	16.669	189	.088		
	Total	107.850	192			

a. Dependent Variable: Tax Collection Improved

b. Predictors: (Constant), employees' perceptions, AI's role in detecting tax fraud

Table 7 shows that the regression mode; largely explains the changes in tax collection improvement. This model accounts for a large amount of the total variance (107.85) with 91.18 due to the independent variables; employees' perception of AI and role of AI in fraud detection, and 16.67 remaining unexplained. The high F value (344.612) and p value of .000 indicate that the model fits the data very well since the p-value is less than 0.05. In general, the results indicate that these factors together have a significant contribution to improving tax collection in the Zanzibar Revenue Authority.

Table 8

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.028	.127		-.222	.825
	Employees' Perceptions	.322	.042	.344	7.689	.000
	AI's Role in Detecting Tax Fraud	.366	.054	.340	6.747	.000

Dependent Variable: Tax Collection Improved

From: $Y=\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$

where

Y = Dependent variable (tax collection improved), β_0 = Interrupt (time constant), β_1, β_2 = Coefficients of independent variables, X_1, X_2 = Independent variables (employee's perception, AI fraud detection) and ε = Error term (difference between observed and predicted values),

$Y= -0.028+0.322X_1+0.366X_2+ 0.297$

Table 8 shows that all variables; employee perceptions of AI (0.322) and the role of AI in detecting tax fraud (0.366) positively influence improvements in tax collection. Since all p-values are .000, these effects are statistically significant. The standardized beta indicates that employee perceptions have high influence, followed by the role of AI in detecting fraud. Therefore, employee perceptions and the role of AI in detecting tax fraud can significantly increase tax collection performance at the Zanzibar Revenue Authority.

4.3 Discussion

According to the results of this study, the findings directly support the existence of Technological Acceptance Model (TAM) which emphases on two factors: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Thus, the study depicted that ZRA employees seem to have a positive perception towards implementing AI in tax collection. The majority of respondents not only showed a wider understanding of AI but also expressed their acceptance of AI regarding its potential to enhance revenue performance. This is clearly consistent with Perceive Usefulness of TAM which suggests that individuals are willing to adopt and integrate AI system into their daily work when they find it useful. These results aligned with high standardized beta coefficient of (0.322) which indicates that employee perceptions have a significant influence on improving tax collection.

Furthermore, the results of standardized beta coefficients of (0.366) indicates the role of AI in detecting tax fraud positively influence improvements in tax collection. This analysis support component of TAM which is PEOU that used to determine the role of AI in detecting tax fraud, as respondents agreed that AI is an effective tool which is easy to use for detecting fraudulent activities. Overall, these results demonstrate the effectiveness and usefulness of AI in tax management within tax authority.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

To conclude, this study focused on examining the impact of artificial intelligence (AI) on improving tax collection at Zanzibar Revenue Authority (ZRA), supported by the following specific objectives: To assess employee's perceptions on the implementation of Artificial Intelligence on improving tax collection at Zanzibar Revenue Authority. To examine the role of AI in detecting tax fraud on improving tax collection at Zanzibar Revenue Authority, the participants of this study were asked their views on each of these specific objectives.

The results of the study indicated that most participants have a good understanding on the concept of artificial intelligence (AI) and are willing to incorporate it into their daily routine because they believe it can improve and encourage accurate tax collection. This positive attitude facilitates the integration of AI technology into the ZRA tax process. Regarding the role of AI in identifying tax fraud activities, participants noted that AI technologies are used more accurately beyond traditional methods in detecting data leakage and tax evasion.

5.2 Recommendations

It is recommended that; ZRA urgently needs to invest in AI to help improve revenue performance, this investment will require a robust digital infrastructure with strong data security and privacy measures while adopting a phased implementation strategy. To avoid failure, it is advisable to start with pilot projects while carefully selecting suitable AI technologies for good integration with existing systems.

REFERENCES

Abkar, Y., & Chaihab, S. (2024). Optimization of smart taxation using artificial intelligence: Risks and opportunities. *Journal of Theoretical and Applied Information Technology*, *102*(5), 1870–1884.

Adam, H. (2019). The digital revolution in Africa: Opportunities and hurdles. In *Proceedings of 10th International Conference on Digital Strategies for Organizational Success*.

Adegboye, A., Uwuigbe, U., Ojeka, S., Uwuigbe, O., Dahunsi, O., & Adegboye, K. (2022). Driving information communication technology for tax revenue mobilization in Sub-Saharan Africa. *Telecommunications Policy*, *46*(7), 102329.

Aggarwal, S. (2024). The role of artificial intelligence in tax administration and compliance: A new era of digital taxation. *KUEY*, *30*(1), 3831–3837. https://doi.org/10.53555/kuey.v30i1.7581

Akello, J. (2022). Artificial intelligence in Kenya – Policy brief. Paradigm Initiative. https://paradigm.org/publications/ai-kenya-policy-brief/

Bala, A., Adekunle, A., & Olarewaju, T. (2022). Artificial intelligence in accounting for revenue generation in Nigeria: A post-COVID-19 impact analysis. *Accounting & Taxation Review*, *6*(1). http://www.atreview.org

Bentley, D. (2022). Tax officer 2030: The exercise of discretion and artificial intelligence. *E-Journal of Tax Research*, *20*(1), 72–100.

Blume, J., & Bott, M. (2021). Information technology in tax administration in developing countries. Kreditanstalt für Wiederaufbau (KfW) Development Bank. https://www.taxcompact.net/documents/IT-Tax-Administration-Study.pdf

Caroline, B., & Collin, C. (2024). AI and the modern tax agency: Adopting and deploying AI to improve tax administration. IBM Center for Business of Government. https://www.businessofgovernment.org

Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*, 475–487. https://doi.org/10.1006/imms.1993.1022

Dreisbach, T. (2019). Creating an electronic tax administration system in Zambia. *International Journal of Sociotechnology and Knowledge Development*, *11*(2), 1–14.

Franzese, M., & Iuliano, A. (2018). Correlation analysis. In *Encyclopedia of Bioinformatics and Computational Biology* (pp. 706–721). Elsevier. https://doi.org/10.1016/B978-0-12-809633-8.20358-0

Gwagwa, A., Kraemer-Mbula, E., Rizk, N., Rutenberg, I., & De Beer, J. (2020). Artificial intelligence (AI) deployments in Africa: Benefits, challenges and policy dimensions. *The African Journal of Information and Communication*, (26), 1–28. https://doi.org/10.23962/10539/30361

Junquera-Varela, R. F., Lucas-Mas, C. O., Krsul, I., Calderon Yksic, V. O., & Arce Rodriguez, P. (2022). Digital transformation of tax and customs administrations. https://doi.org/10.1596/37629

Kumar, M., Raut, R. D., Mangla, S. K., Ferraris, A., & Choubey, V. K. (2022). The adoption of artificial intelligence-powered workforce management for effective revenue growth of micro, small, and medium-scale enterprises (MSMEs). *Production Planning & Control*, 1–17.

Kunene, T. (2021). The perceived impact of artificial intelligence on operations performance in the South African life insurance industry.

Licensed Under Creative Commons Attribution (CC BY-NC)

Maan, A. T., Abid, G., Butt, T. H., Ashfaq, F., & Ahmed, S. (2020). Perceived organizational support and job satisfaction: A moderated mediation model of proactive personality and psychological empowerment. *Future Business Journal*, *6*(1), 21.

Mendoza, S. D., Nieweglowska, E. S., Govindarajan, S., Leon, L. M., Berry, J. D., Tiwari, A., … Wang, H. (2020). Automation activities, capacity building and revenue collection performance at Kenya Revenue Authority. *Nature Microbiology*, *3*(1), 641.

Momani, A. M. (2020). The unified theory of acceptance and use of technology: A new approach in technology acceptance. *International Journal of Sociotechnology and Knowledge Development*, *12*(3), 79–98. https://doi.org/10.4018/IJSKD.2020070105

Moore, M., Prichard, W., Fjeldstad, O.-H., International African Institute, Royal African Society, & World Peace Foundation. (2018). *Taxing Africa: Coercion, reform and development*. Zed Books.

Mpofu, F. Y. (2024). Digital transformation by tax authorities. In *Digital Transformation in South Africa: Perspectives from an Emerging Economy* (pp. 151–170). Springer.

Murorunkwere, B. F., Haughton, D., Nzabanita, J., Kipkogei, F., & Kabano, I. (2023). Predicting tax fraud using supervised machine learning approach. *African Journal of Science, Technology, Innovation and Development*, *15*(6), 731–742. https://doi.org/10.1080/20421338.2023.2187930

Nembe, J.. K., Atadoga, J.. O., Mhlongo, N.. Z., Falaiye, T., Olubusola, O., Daraojimba, A.. I., & Oguejiofor, B.. B. (2024). The role of artificial intelligence in enhancing tax compliance and financial regulation. *Finance & Accounting Research Journal*, *6*(2), 241–251. https://doi.org/10.51594/farj.v6i2.822

Nuryani, M., Mutiara, A. B., Wiryana, I. M., Purnamasari, D., & Putra, S. N. W. (2024). Artificial intelligence model for detecting tax evasion involving complex network schemes. *APTISI Transactions on Technopreneurship*, *6*(3), 339–356. https://doi.org/10.34306/att.v6i3.436

Oliveira, T., Thomas, M., & Espadanal, M. (2014). Assessing the determinants of cloud computing adoption: An analysis of the manufacturing and services sectors. *Information & Management*, *51*(5), 497–510. https://doi.org/10.1016/j.im.2014.03.006

Oluwabusayo Adijat Bello, & Olufemi, K. (2024). Artificial intelligence in fraud prevention: Exploring techniques, applications, challenges and opportunities. *Computer Science & IT Research Journal*, *5*(6), 1505–1520. https://doi.org/10.51594/csitrj.v5i6.1252

Osakwe, S. (2023). Tanzania's digitalisation journey: Opportunities for value creation. GSMA. https://www.gsma.com/publicpolicy/tanzania-digitalisation-opportunities/

Puspita, A. F., Palil, M. R. Bin, Puspaningrum, A., & Suman, A. (2024). Taxing artificial intelligence: Value impacts and governance in the tax sector (study in Indonesia and Malaysia). *Pakistan Journal of Life and Social Sciences (PJLSS)*, *22*(1), 4623–4633. https://doi.org/10.57239/pjlss-2024-22.1.00343

Rahman, S., Khan, R. S., Sirazy, M. R. M., & Das, R. (2024). An exploration of artificial intelligence techniques for optimizing tax compliance, fraud detection, and revenue collection in modern tax administrations. *International Journal of Business Intelligence and Big Data Analytics*, *7*(3), 56–80. https://research.tensorgate.org/index.php/IJBIBDA/article/view/157

Rubab, S. A. (2023). Impact of AI on business growth. *The Business and Management Review*, *14*(2), 7–9.

Shark, A. R. (2022). Future challenges—artificial intelligence, robotics, privacy, public trust. In *Technology and Public Management* (pp. 420–453). Routledge.

Tayarani N., M. H. (2021). Applications of artificial intelligence in battling against COVID-19: A literature review. *Chaos, Solitons & Fractals*, *142*, 110338. https://doi.org/10.1016/j.chaos.2020.110338

Umar, M., Bappi, U., & James, C. (2023). The effect of information communication technology (ICT) on revenue generation in Gombe State Internal Revenue Service. *AKSU Journal of Administration and Corporate Governance*, *3*(3), 22–34. https://doi.org/10.61090/aksujacog.2023.017

UNESCO. (2022). Assessing the impact of ICT integration policy on the equitable access to quality education in African contexts: The case of Kenya. GEM Report Fellowship.

World Bank. (2024). Artificial intelligence in the public sector. https://doi.org/10.1787/869f83c1-en

Yalamati, S. (2023). Identify fraud detection in corporate tax using artificial intelligence advancements. *International Journal of Machine Learning for Sustainable Development*, *5*(2). https://ijsdcs.com/index.php/IJMLSD/article/view/468

ZRA. (2020). *Final ZRB fourth corporate plan (2020–2025)*. Zanzibar Revenue Authority.

ZRA. (2024). *Annual revenue collection report 2023/2024*. Zanzibar Revenue Authority.

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Les représentations que les apprenants Kenyans de Français langue étrangère se font de la France, des Français et de la langue française

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ABSTRACT

This article focuses on the social and sociolinguistic representations that Kenyan students learning French as a foreign language develop about France, the French people and the french language in the year 2023. These images lie under the social linguistic and language pedagogy. Kenya is one of the English-speaking nations with its language policy grounded on the English-Kiswahili bilingualism, where a variety of foreign languages are taught, including French as an optional subject. Nevertheless, the language is one of the most commonly dropped subjects in secondary school. It thus seems obligatory to challenge the subjective and symbolic aspects of this attrition especially the social and emotional images that Kenyan learners have developed concerning France, the French people and the French language. The primary aim of the study was to learn the affective and representational variables that shape the attitude of learners towards the French language. Based on the theory of affectivity, the research aimed at investigating the representational practices of Kenyan students in Kakamega County, on France, the French people, and the French language. It had the following objectives: to capture the representations of the Kenyan learners towards France; to determine the images that they develop about the French people; and to see the perceptions of the Kenyan learners in regard to the French language. The research adopted the mixed method, with the use of both qualitative and quantitative analysis. The population was comprised of 291 students in 24 schools which teach French as a subject from form one to four in Kakamega County. A sample size of 81 form four students was used to gather data because this group was deemed the most appropriate to give their learning experiences in the field of foreign language learning (FLE). This analysis has revealed that Kenyan FLE students have devaluing representations and positive representations are primarily produced in learning contexts where students feel appreciated, heard and engaged. Pedagogical practices that empower the emotional aspect of the learners could thus be adopted by teachers of FLE as evidenced by this study.

Keywords: Affectivity, French as a Foreign Language, Perceptions, Representations

RESUME

Cet article se focalise sur les représentations sociales et sociolinguistiques que se construisent les élèves kenyans du FLE à l'égard de la France, des Français et de la langue française en 2023. Celles-ci s'insèrent dans le domaine de sociolinguistique et didactiques des langues. Le Kenya, pays anglophone dont la politique linguistique repose sur le bilinguisme anglais-kiswahili, offre un enseignement de plusieurs langues étrangères, parmi lesquelles figurent le français, une matière facultative. Cependant, cette langue demeure l'une des disciplines la moins choisie et la plus abandonnée au fil du parcours secondaire. Il apparaît nécessaire d'interroger les dimensions subjectives et symboliques de cette déperdition, notamment les représentations sociales et affectives que les apprenants kényans se construisent à propos de la France, des Français et de la langue française. L'objectif principal de cette étude a consisté à comprendre les facteurs affectifs et représentationnels qui influencent les attitudes des apprenants vis-à-vis de la langue française. Ancrée sur la théorie de l'affectivité (Tomkins1962), cette étude s'est tâchée d'examiner les pratiques représentationnelles des élèves kenyans dans le comté de Kakamega, au Kenya, à propos de la France, des Français et de la langue française. Elle a poursuivi les objectifs ci-après : saisir les représentations des apprenants kenyans de la France ; établir les images que ceux-ci se font des Français et de déceler les perceptions des apprenants kenyans vis-à-vis de la langue française. L'étude a opté pour l'approche mixte articulant les approches qualitatives et quantitatives. La population a été constituée de 291 élèves dans 24 écoles qui proposent le français comme matière dès la première à la quatrième année d'études dans le comté de Kakamega. Les données ont été récoltées auprès de 81 élèves de la quatrième année, ce niveau étant le plus propice à partager sur leur expérience lors de l'apprentissage du FLE. L'étude a établi que les apprenants kenyans du FLE ont des représentations dévalorisantes et que les représentations positives émergent principalement dans des environnements d'apprentissage où les élèves se sentent valorisés, écoutés et impliqués. Les enseignants de FLE pourraient adopter des pratiques pédagogiques qui engagent affectivement les apprenants comme l'a montré cette étude.

Mots Clés : Affectivité, Français Langue Etrangère, Perceptions, Représentations

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I. INTRODUCTION

Dans cet article, les auteurs étudient les représentations sociales et sociolinguistiques que construisent les élèves kenyans à l'égard de la France, des Français ainsi que de la langue française. Celles-ci occupent une place singulière dans le champ de la sociolinguistique et de la didactique des langues. Le français occupe une position particulière parmi les langues du monde en raison de son passé de puissance coloniale, de son influence culturelle et de son rôle au sein des organisations internationales telles que l'organisation des Etats Unis, l'union européenne et l'union africaine (Maurer et al., 2025).

En Afrique subsaharienne, par exemple au Rwanda, en Ouganda ou au Nigeria, le français est proposé comme matière facultative dans l'enseignement secondaire. Cependant, les études montrent que cette discipline demeure l'une des moins populaires et qu'elle est très souvent abandonnée par les apprenants (Mutemi, et al., 2023). Les causes évoquées incluent le manque de ressources pédagogiques, une approche d'enseignement centrée sur la grammaire, ainsi que l'existence de facteurs affectifs et symboliques qui influencent les représentations des élèves. Les politiques linguistiques en Afrique subsaharienne et les représentations sociales et culturelles des langues européennes chez les jeunes urbains révèlent que ces langues, bien qu'elles soient valorisées pour leurs fonctions académiques et économiques, souffrent fréquemment d'un manque de légitimité culturelle, ce qui réduit leur attractivité auprès des jeunes générations (Bamgbose, 2000).

Ces observations confirment l'idée que les représentations des apprenants oscillent entre l'espoir et la déception. Ainsi, le français est perçu à la fois comme un instrument de promotion sociale et comme une langue étrangère éloignées des expériences locales. Cette ambivalence introduit une forme d'insécurité identitaire qui affecte à la fois les processus d'apprentissage et les dynamiques de motivation. C'est dans cette perspective que s'inscrit la présente étude. Elle examine les représentations sociales et sociolinguistiques que les apprenants kenyans de français langue étrangère se construisent à propos de la France, des Français et de la langue française. Ancrée dans la théorie de l'affectivité de Tomkins (1962), elle cherche à comprendre comment les dimensions affectives et symboliques peuvent contribuer à expliquer l'abandon ou, au contraire, l'adhésion à l'étude du français chez les élèves du secondaire au Kenya. L'objectif est d'éclairer, au sens figuré, les facteurs de représentation et d'affectivité susceptibles de réorienter la dynamique d'apprentissage du français dans le contexte éducatif kenyan.

Cette recherche adopte un plan descriptif et a eu recours à une approche mixte intégrant à la fois des démarches qualitatives et quantitatives. La population cible se compose de 291 élèves inscrits dans 24 établissements secondaires du comté de Kakamega où le français est enseigné. Un échantillon de 81 élèves de quatrième année a été retenu, car ils disposent d'une expérience suffisante pour partager leurs représentations. Les données ont été recueillies au moyen d'un questionnaire, puis analysées selon deux approches : qualitative et quantitative.

1.1 Énoncé du Problème

Dans le système éducatif kényan, le français langue étrangère (FLE), bien qu'officiellement reconnu comme matière optionnelle, est la matière la moins choisie et la plus abandonnée par les apprenants. Cette tendance reflète une instabilité structurelle dans l'adhésion des élèves à l'apprentissage du FLE. Ce phénomène ne peut être expliqué uniquement par des facteurs institutionnels ou pédagogiques. Il apparaît nécessaire d'interroger les dimensions subjectives et symboliques de cette déperdition, notamment les représentations sociales et affectives que les apprenants kényans se construisent à propos de la France, des Français et de la langue française. Il serait intéressant de comprendre comment les représentations sociales et sociolinguistiques façonnent l'engagement ou le désengagement des élèves kényans vis-à-vis du FLE. En analysant ces représentations, cette étude vise à révéler les facteurs affectifs susceptibles de nourrir, ou de réorienter les dynamiques d'apprentissage du français dans les écoles secondaires du Kenya.

1.2 Objectifs de Recherche

Comprendre les facteurs affectifs et représentationnels qui influencent les attitudes des apprenants envers la langue française.

II. REVUE DE LA LITTÉRATURE

2.1 Revue Théorique

Cet article, consacré à l'analyse du rôle des représentations dans l'apprentissage, s'appuie sur la théorie de l'affectivité développée par le psychologue américain Tomkins dans années 1960. Cette théorie, présentée dans son œuvre majeure Affect Imagery Consciousness (1962–1992), propose une nouvelle compréhension des émotions en tant que moteurs fondamentaux de la conscience, du comportement et de la cognition humaine. Tomkins (1962) rejette la dichotomie rigide entre émotion et raison pour mettre en lumière le rôle central des affects dans la motivation, la

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pensée et l'apprentissage. Dans cette optique, la théorie de l'affectivité offre un cadre heuristique puissant pour repenser les dynamiques éducatives, notamment celles qui concernent la motivation, les attitudes, et les représentations sociales des apprenants dans un contexte scolaire.

2.2 Revue Empirique

2.2.1 Orientation et Motivations A L'apprentissage Du Français Dans L'aire Africaine

De nombreuses études attestent du fait que des considérations pragmatiques influencent fréquemment la décision des communautés africaines d'apprendre le français.

L'objectif de l'étude d'Uwimana, Kubwimana et Yanzigiye (2024), portant sur les attitudes linguistiques des élèves du secondaire et des étudiants universitaires au Rwanda, était d'examiner la perception du multilinguisme et de l'apprentissage du français. L'étude a révélé une attitude globalement positive à l'égard du multilinguisme mais les résultats ont mis en évidence que des obstacles matériels tels que le manque de ressources pédagogiques, l'insuffisance de la formation des enseignants et la faible utilisation du français dans la vie quotidienne freinent le désir d'apprendre cette langue. Ces résultats indiquent que les représentations des apprenants oscillent entre l`optimisme et la désillusion, selon les conditions institutionnelles et matérielles de l'apprentissage.

D'un point de vue plus large, Bamgbose (2000) s'est intéressé aux politiques linguistiques en Afrique subsaharienne et a tenté de comprendre les représentations sociales et culturelles des langues européennes chez les jeunes urbains. Son analyse a révélé que ces langues, bien qu'elles soient valorisées pour leurs fonctions académiques et économiques, souffrent fréquemment d'un manque de légitimité culturelle, ce qui réduit leur attractivité auprès des jeunes générations. Ces observations confirment l'idée que les représentations des apprenants oscillent entre l'espoir et la déception. Ainsi, le français est perçu à la fois comme un instrument de promotion sociale et comme une langue étrangère éloignées des expériences locales. Cette ambivalence introduit une forme d'insécurité identitaire qui affecte à la fois les processus d'apprentissage et les dynamiques de motivation.

Lumbu et Zannier-Wahengo (2017), dans une recherche menée à l'Université de Namibie, ont cherché à identifier les différentes formes de motivation (instrumentales et intégratives) chez les étudiants universitaires namibiens apprenant le français. L'étude a révélé que les étudiants ont à la fois des motivations instrumentales et intégratives dans l'apprentissage de la langue française mais les motivations instrumentales semblent plus concrètes. En contexte kenyan, Omusonga (2003) s'est penché sur l'impact de la langue maternelle sur la motivation et la rétention en français, à travers une enquête auprès des élèves du secondaire dans le district de Bungoma. Sur un plan plus global, Gardelle et Jacob (2020) ont étudié le rôle des écoles dans la construction des identités nationales en Afrique francophone, en se focalisant sur les systèmes scolaires et les acteurs éducatifs.

2.2.2 Incertitude Linguistique et Performance Scolaire

L'insécurité linguistique constitue l'un des facteurs relevés par Mutemi, Mulenda et Kalangi (2023) dans le *European Journal of Linguistics*, 2(3), pp. 37-52), à travers une étude consacrée aux représentations linguistiques des étudiants universitaires en Afrique de l'Est. L'objectif de cette étude était d'analyser le lien entre les perceptions identitaires et l'apprentissage du français. Les auteurs ont constaté que ce phénomène est souvent associé au sentiment d'« impermanence linguistique » ressenti par les apprenants, en raison du décalage entre les acquis scolaires et les attentes sociales. Ce constat renforce l'idée que le français, en tant que langue de prestige, demeure fréquemment déconnecté du quotidien des étudiants.

De même, Gardner (2010), à travers ses travaux sur l'*Attitude/Motivation Test Battery* appliqués à des apprenants de langues étrangères au niveau universitaire, cherchait à examiner l'impact de l'anxiété linguistique sur l'acquisition. L'étude a révélé que l'anxiété réduit de manière significative l'efficacité du processus d'apprentissage des langues, confirmant ainsi que les dimensions affectives jouent un rôle central dans la réussite linguistique.

Ces constats trouvent un écho dans les recherches de Cumbe et Muchanga (2001), qui, à travers une étude menée au Mozambique auprès d'élèves du secondaire, se sont intéressés aux pratiques pédagogiques et à leur impact sur l'insécurité linguistique. Leur objectif était d'analyser comment le manque de contextualisation des contenus et l'accent excessif mis sur la norme académique accentuent la crainte des apprenants de commettre des erreurs, compromettant ainsi leur participation active en classe.

De son côté, Boyer (1990), dans une enquête réalisée en France auprès d'étudiants de français langue étrangère, visait à comprendre le lien entre les normes institutionnelles et le vécu des apprenants. Ses résultats ont montré que la rigidité des attentes scolaires et une évaluation trop centrée sur la correction grammaticale nourrissaient des sentiments d'insécurité linguistique persistants. Ces travaux soulignent que l'insécurité linguistique n'est pas un phénomène récent ni limité au contexte africain, mais qu'il s'inscrit dans une problématique plus large, touchant au rapport au savoir linguistique et aux pratiques pédagogiques.

Mutugi (2024), à travers une recherche doctorale à Maseno University, a cherché à mesurer l'influence de l'insécurité linguistique sur la communication orale en français chez les lycéens de Kisumu. Sur un registre plus large,

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Singy (2004), dans un volume consacré aux identités de genre et de classe, a examiné comment celles-ci se croisent avec les vulnérabilités linguistiques chez des apprenants francophones de divers contextes européens**.**

2.2.3 Facteurs et Modalités de Choix de l'étude du Français

Bianco (2010) a mené une recherche comparative sur le choix linguistique en contexte urbain africain, mettant en lumière le prestige du français et sa concurrence avec l'anglais auprès d**'**apprenants africains urbains. En Europe, Lafontaine (2001) a exploré les dispositifs d'évaluation externe et leur impact sur la motivation des élèves du secondaire en Belgique francophone. Ces manuels, dispositifs de soutien et stratégies didactiques joue un rôle central dans la consolidation ou l'affaiblissement de la motivation.

Ces résultats indiquent que la décision d'étudier le français n'est que rarement motivée par une seule raison. Elle résulte d'un entrelacement de motivations personnelles et de conditions institutionnelles, ce qui implique que les politiques linguistiques doivent agir simultanément sur ces deux dimensions afin de garantir une appropriation durable et efficace de la langue.

2.2.4 Contenu Didactique et Décolonisation du Programme Scolaire

Noutchie (2025), dans un article sur la réforme curriculaire et les savoirs autochtones, a insisté sur la nécessité de décoloniser l'éducation africaine, en s'appuyant sur les décideurs éducatifs africains. Dans la même optique, Ngugi wa Thiong'o (1986), pionnier dans le domaine de la critique littéraire et éducative en Afrique, a plaidé pour la décolonisation des curricula scolaires, en mettant en avant la nécessité de redonner une place centrale aux réalités africaines dans l'éducation. Ses travaux, qui s'adressent à la fois aux enseignants et aux décideurs politiques, visaient à démontrer que les contenus scolaires doivent refléter les identités culturelles locales pour renforcer leur légitimité et leur efficacité.

2.2.5 Le Français dans le Monde et ses Implications Pour le Kenya

Calvet (1996), dans une analyse comparative des langues de communication internationale, avait pour objectif de mesurer le poids du français par rapport à d'autres langues mondiales. Ses résultats rappellent que le français figure parmi les cinq langues les plus influentes dans les relations diplomatiques, culturelles et économiques.

Maurer et al. (2025), à travers une étude sur l'influence linguistique en Afrique subsaharienne menée auprès de jeunes apprenants et d'acteurs institutionnels, ont confirmé cette tendance en soulignant la valeur stratégique du français dans les échanges régionaux et internationaux.

Dans le cas kenyan, l'intégration du français dans le système éducatif contribuerait à renforcer la compétitivité des jeunes générations sur le marché mondial. Le français n'apparaît donc plus comme une langue périphérique, mais comme une compétence stratégique, surtout dans un contexte où la mondialisation et les politiques éducatives nationales encouragent le multilinguisme.

III. MÉTHODOLOGIE

3.1 Contexte et Objectifs de l'Étude

Cette étude s'inscrit dans une démarche descriptive et analytique, centrée sur l'exploration des représentations sociales et sociolinguistiques que se construisent les élèves kenyans apprenant le français langue étrangère (FLE) à propos de la France, des Français et de la langue française en 2023. Le contexte kenyan se caractérise par une politique linguistique officielle fondée sur le bilinguisme anglais-kiswahili, dans laquelle le français figure parmi les langues étrangères enseignées à titre optionnel au secondaire. Cependant, le taux d'abandon du français reste préoccupant, ce qui justifie l'intérêt de s'interroger sur les dimensions subjectives, affectives et symboliques qui influencent la persévérance ou l'attrition linguistique. L'étude vise ainsi à saisir les représentations des apprenants kenyans envers la France, à déterminer les images qu'ils développent à l'égard des Français, et à analyser leurs perceptions de la langue française, en s'appuyant sur la théorie de l'affectivité.

3.2 Devis de Recherche

La recherche a adopté un design mixte, combinant des approches quantitative et qualitative afin de mieux cerner la complexité des représentations étudiées. Ce devis transversal (étude de type « cross-sectional ») permet de recueillir, à un moment donné, les opinions, perceptions et expériences d'un groupe d'apprenants à la fin de leur parcours secondaire. La partie quantitative repose sur l'analyse statistique de données issues de questions fermées du questionnaire, tandis que la dimension qualitative s'appuie sur l'analyse des réponses ouvertes et des commentaires libres, afin d'enrichir la compréhension des phénomènes observés. Ce design offre ainsi une triangulation méthodologique qui garantit la complémentarité des analyses et la validité des résultats.

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3.3 Population et Échantillonnage

La population cible de l'enquête était composée de 291 élèves issus de 24 établissements secondaires de Kakamega County, où le français est enseigné de la première à la quatrième année du secondaire. Un échantillon raisonné de 81 élèves de « form four » a été retenu pour la collecte de données, ce groupe étant jugé le plus à même de restituer des expériences d'apprentissage abouties et des représentations construites tout au long du cursus. Cette sélection assure la pertinence et la profondeur des données recueillies, les élèves de dernière année ayant un recul suffisant sur leur parcours en FLE.

3.4 Outils et Procédure DDe Collecte Des Données

Pour la collecte des données, un questionnaire structuré a été élaboré, combinant des questions fermées (permettant le traitement statistique des fréquences et pourcentages) et des questions ouvertes (offrant la possibilité d'exprimer les opinions, expériences et ressentis personnels). Les questionnaires ont été administrés en présentiel auprès des élèves, avec l'appui et la supervision des enseignants de FLE dans chaque établissement, afin de garantir la fiabilité du processus et le respect du cadre scolaire.

3.5 Analyse des Données

Les réponses aux questions fermées ont fait l'objet d'une analyse statistique descriptive (fréquences, pourcentages) afin d'identifier les tendances majeures dans les canaux d'exposition, les perceptions et les motivations ou freins à l'apprentissage. Les résultats quantitatifs ont été complétés par une analyse qualitative thématique des réponses ouvertes, permettant de dégager des thèmes récurrents et d'illustrer les résultats par des verbatims significatifs. La triangulation de ces deux approches a permis de mieux appréhender la complexité des représentations des élèves et leur impact sur l'engagement et la motivation en FLE.

3.5 Considérations Éthiques

Le consentement éclairé des élèves a été recueilli avant la passation des questionnaires, et toutes les informations personnelles ont été traitées de manière strictement confidentielle. L'anonymat a été préservé tout au long du processus afin de garantir la sincérité des réponses et le respect de la vie privée des participants. La démarche éthique adoptée a instauré un climat de confiance, favorisant ainsi la fiabilité et la qualité des données obtenues.

IV. RESULTATS ET DISCUSSION

4.1 Représentations sur la France

Le premier objectif a consisté à saisir les représentations que les apprenants kenyans de FLE se font de la France. A la question selon laquelle par quel canal les sujets connaissaient la France, ils ont indiqué les canaux repris dans le tableau ci-dessous :

Tableau 1

Canaux par lesquels l'on a connu la France

N°	Canal	F	%
1.	Famille	10	12,35%
2.	Ecole	45	55,56%
3	Collègue/ami(e)	08	9,88%
4	Médias	05	6,17%
5	Radio/télévision	13	16,04%
6	Autres (à préciser)	00	00%
	Totaux	**81**	**100**

De ce tableau 1, 45 élèves ont appris de la France à l'école, 13 élèves ont appris de la France à travers la radio et la télévision et 10 élèves de la famille. 8 élèves ont appris de la France auprès des amis alors que 5 élèves l'ont connu à travers les médias. L'examen du tableau révèle que la majorité des apprenants kenyans (55,56 %) connaissent la France à travers l'école, suivie par la télévision et la radio (16,04 %), la famille (12,35 %), les collègues 9,88% et les médias 6,17%. Ce constat confirme le rôle central du cadre scolaire dans la formation des représentations culturelles et linguistiques. De même, Lafontaine (2001) souligne que les dispositifs d'évaluation externe participent à renforcer ce rôle structurant de l'école dans la diffusion du français. Cependant, la place secondaire occupée par la famille et les médias suggère que l'ouverture culturelle pourrait être élargie grâce à des politiques éducatives intégrant davantage de médiations extrascolaires. Dans cette perspective, Maurer et al. (2025) et Gardelle & Jacob (2020) insistent sur la

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nécessité de préparer les jeunes générations africaines à la mondialisation et à l'intégration régionale, en diversifiant les canaux d'exposition au-delà du seul cadre scolaire.

Ces résultats indiquent que c'est à l'école où les élèves se renseignent de la France. Ceci veut dire que l'environnement de l'école contribue beaucoup à ce que les élèves se font de ce qu'ils apprennent en classe et en dehors de celle-ci. Connaitre la France signifierait que le pays intéresse certains élèves pour des raisons particulières qui peuvent les inciter à se passionner à tout ce qui est en lien avec le pays. A noter également que pour certains autres élèves, l'école n'a pas eu d'effet sur ce qu'ils savaient de la France. Ceci indique que c'est l'intérêt qui pousse les apprenants à vouloir apprendre ou connaitre la France.

A la question : « Que savez-vous de la France en tant que pays ? », les enquêtés ont répondu de la façon ci-après :

Tableau 2

Ce que l'on connait de la France

N°	Réponses	F	%
A	Pays d'Europe	08	9,88%
B	Pays des Blancs	21	25,93%
C	Pays très éloigné de L'Afrique et du Kenya	09	11,11%
D	Pays francophone	03	3,70%
E	Ancienne puissance colonisatrice	08	9,88%
F	Pays développé	25	30,86%
G	Grande puissance au niveau du monde	07	8,64%
I	Autres (à préciser)	00	00
	Totaux	81	100

La lecture du tableau 2 révèle que pour 8 élèves, la France est un pays d'Europe, et pour 21 élèves, c'est un pays des Blancs ; 9 élèves pensent que la France est un pays très éloigné de l'Afrique et du Kenya, 3 élèves disent celle-ci est un pays francophone et 8 élèves pensent que la France est une ancienne puissance colonisatrice. D'après 25 élèves, c'est un pays développé et 7 élèves la trouvent une grande puissance au niveau du monde.

Ce tableau met en évidence que 30,86 % des élèves considèrent la France comme un pays développé et 25,93 % comme un « pays des Blancs ». Cette perception double, à la fois valorisante et stéréotypée, reflète les observations de Uwimana, Kubwimana et Yanzigiye (2024) sur l'ambivalence entre admiration pour la modernité et réduction raciale de l'altérité. Le fait que 9,88 % associent la France à son passé colonial rejoint l'analyse de Bamgbose (2000), qui montrent que la mémoire coloniale et le déficit de légitimité culturelle pèsent sur les représentations africaines du français. Singy (2004) a insisté sur l'importance des identités sociales (classe, genre) dans l'intériorisation des représentations linguistiques. Enfin, Omusonga (2003) rappelle que les politiques linguistiques nationales et l'usage de la langue maternelle dans l'enseignement influencent la coexistence d'attirance et de distance affective vis-à-vis du français.

Ceci signifie que les élèves qui trouvent la France comme un pays développé la valorisent et peuvent donc se faire des représentations positives alors que ceux qui la voient comme une grande puissance et un pays francophone pourraient penser que la France leur est éloignée et ils ne trouveraient donc pas la motivation de s'y intéresser.

4.1.1 Représentations sur les Français

Le deuxième objectif cherchait à établir les représentations que les apprenants kenyans de FLE se construisent des Français. A la question « avez-vous déjà rencontré un Français ou une Française ? », les sujets ont répondu comme suit :

Tableau 3

Rencontre des Français

Réponses	F	%
Oui	05	6,17
Non	76	93,83
Indécis	00	00
Totaux	**81**	**100**

Source : Terrain d'étude

Il ressort du tableau 3 que 76 sujets soit 93,83% ont répondu par « non » et 5 sujets soit 6,17% ont répondu affirmativement. 93,83 % des apprenants n'ont jamais eu d'interactions directes avec des locuteurs natifs du français. La plupart des apprenants (93,83 %) n'a jamais été en contact direct avec des Français, ce qui confirme que l'exposition réelle est limitée. (Cumbe & Muchanga (2001) montrent, dans des contextes africains, que l'absence

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d'expériences authentiques (échanges, intervenants natifs, mobilités) empêche le développement de compétences interculturelles et renforce des images stéréotypées. De son côté, Lumbu and Zannier-Wahengo (2017) confirment, dans un contexte namibien, que l'absence de contacts réels avec la culture francophone réduit la motivation intégrative, au profit d'une motivation essentiellement instrumentale.

76 élèves ont dévoilé qu'ils n'ont jamais eu contact avec les français, un fait qui pourrait les inciter à vouloir les rencontrer ou non selon leur curiosité. Ceci signifierait que les élèves n'ont pas eu l'occasion d'interagir avec les français. Cependant, les interactions des élèves avec les natifs de la langue française seraient un facteur motivateur dans l'apprentissage de la langue. 5 sujets enquêtés, qui avaient rencontré les français, ont répondu à la façon suivante :

-Pr.02 je l'ai rencontré à l'église catholique de Mombasa.
-Pr.0.3 au restaurant à Kisumu.
-Pr.0.5 au supermarché naivas à Nairobi.
-Pr.09 au stade Kasarani pendant un match de football.
-Pr.11 à la frontière de Sirare/Isibania.

Ces réponses indiquent que les élèves ont rencontré les français d'une façon non ordonnée, et par hasard, n'importe où. De telles rencontres n'auraient pas d'effet sur l'apprentissage et généralement sur ce que les élèves penseraient aux locuteurs de la langue. Il ressort donc de cette étude que les apprenants de FLE n'avaient jamais eu contact avec les natifs de la langue qu'ils apprenaient. Ceci est un facteur qui pourrait entraver l'apprentissage, puisque les élèves n'ont pas de modèle, sauf le professeur, qui est, lui aussi, un non-natif. Les apprenants peuvent se distancier du contenu de ce cours vu qu'ils l'apprennent dans le vide. Le contraire serait un facteur motivateur ; ils apprenaient avec curiosité de vouloir parler comme les natifs, un jour !

Demandés s'ils avaient entendu parler d'un Français ou des Français, les sujets enquêtés ont répondu à la façon suivante : La question cherchant à établir si les sujets avaient entendu parler d'un Français ou des Français, les sujets enquêtés ont répondu à la façon suivante :

Tableau 4
Si l'on a entendu parler d'un Français/des Français

Réponses	**F**	**%**
Oui	25	30,86
Non	56	69,14
Totaux	**81**	**100**

Il ressort du tableau 4 que plus d'une moitié des sujets interrogés, soit 69,14%, n'avaient jamais entendu parler d'un Français/des Français tandis que 30,86% des sujets l'ont entendu. Boyer (1990) souligne que l'absence de référents réels est corrélée à une plus grande anxiété en classe et à une moindre participation. Ce déficit de références culturelles illustre l'absence d'exposition soulignée par Uwimana et al. (2024), qui insistent sur l'importance des médiations culturelles (enseignants natifs, médias francophones, littérature africaine francophone). Maurer et al. (2025) rappellent que les médias internationaux pourraient jouer ce rôle si les conditions d'accès étaient renforcées. Cumbe & Muchanga (2001) soulignent que, sans figures de référence, les apprenants tendent à renforcer des stéréotypes. Mutemi, Mulenda & Kalangi (2023) et Mutugi (2024) confirment que cette absence de repères contribue à l'« insécurité linguistique » et à l'anxiété scolaire, ce qui affecte la participation orale. Gardner (2010) et Singy (2004) rappellent que ces fragilités sont fortement influencées par les dimensions identitaires et affectives liées à l'apprentissage des langues.

Ces résultats révèlent que les apprenants kenyans ne sont exposés aux locuteurs natifs de la langue. Le manque d'interaction avec les Français peut restreindre la formation de représentations positives des locuteurs francophones. Les sujets qui ont entendu parler d'un Français l'ont probablement fait à travers les médias ce qui signifierait une information insuffisante pour établir un véritable contact culturel et linguistique avec les Français.

4.1.2 Perceptions liées à l'apprentissage du français

Le troisième objectif était de déceler les perceptions que les apprenants Kenyans de FLE se construisent de la langue française. Demandés de donner les raisons pour lesquelles ils apprennent le français, les sujets ont répondu de la façon suivante :

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Tableau 5

Raisons avancées pour l'apprentissage du français

Réponses	**F**	**%**
Vous l'aimez	18	22,22
Imposé par l'école	13	16,05
Imposé par des parents	22	27,16
Influencé par des camarades/amis	28	34,57
Autres (à préciser)	00	00
Totaux	**81**	**100**

En lisant le tableau 5, l'on remarque que 28 sujets soit 34,57% apprenaient le français à cause de l'influence des camarades, 22 sujets soit 27,16% le faisaient car c'était imposé par des parents, 18 sujets soit 22,22%, l'apprenaient à cause de l'amour de la langue et 13 sujets soit 16,05% à cause de l'imposition scolaire. En cohérence avec les propositions de Ngugi wa Thiong'o (1986) pour une décolonisation et contextualisation des curricula, l'intégration de contenus africains et locaux dans l'enseignement du français pourrait renforcer la motivation personnelle, en rendant l'apprentissage plus pertinent et connecté aux réalités vécues des apprenants. Pour les 28 sujets soit (34,57 %), imposition parentale, 22 sujets soit (27,16 %) , imposition scolaire et 13 sujets soit (16,05% choix linguistiques, affirment ce que Lafontaine (2001) associe aux pratiques d'évaluation. Enfin, dans une perspective décoloniale), Ngugi wa Thiong'o (1986) et Noutchie (2025) plaident pour l'intégration de contenus locaux et africains dans l'enseignement, afin de transformer ces motivations extrinsèques en motivations authentiques plus durables.

Cela démontre que l'apprentissage du français est davantage perçu comme un besoin scolaire que comme une décision personnelle. Cependant, le fait que peu d'apprenants appréciaient cette langue par un goût personnel constitue un encouragement à développer des stratégies pédagogiques fondées sur la valorisation de la langue française.

A la question par laquelle l'on demandait aux sujets de dire comment ils trouvaient les leçons de français, ils ont répondu à la façon ci-après :

Tableau 6

Ce qu'est le français pour les apprenants

Réponses	**F**	**%**
Très difficile à apprendre	29	35,80
Difficile à apprendre	27	33,33
Facile à apprendre	21	25,93
Indécis(e)	04	4,94
Totaux	**81**	**100**

En lisant le tableau 6, l'on constate que 29 sujets soit 35,80%, pensent que le français est une langue très difficile à apprendre et 27 sujets soit 33,33%, la trouvent une langue difficile à apprendre. Pour 21 sujets, soit 25,93%, c'est une langue facile à apprendre et 4 sujets soit 4,94% étaient indécis. Les résultats révèlent que 69,13 % des apprenants trouvent le français difficile ou très difficile, contre 25,93 % qui le jugent facile. Ce constat rejoint les analyses de Uwimana et al. (2024), qui attribuent cette perception à la distance linguistique entre le français, le swahili et l'anglais, ainsi qu'au manque d'occasions d'usage authentique. Mutemi, Mulenda & Kalangi (2023) parlent d'un sentiment d'« impermanence linguistique », tandis que Mutugi (2024) montre que cette perception freine la prise de parole orale chez les lycéens kenyans. Gardner (2010) et Boyer (1990) associent cette difficulté à l'anxiété linguistique, aggravée par des pratiques évaluatives centrées sur la correction grammaticale (Cumbe & Muchanga, 2001). Pourtant, un quart des apprenants perçoivent le français comme accessible, ce qui confirme que l'autonomie et la perception de progression peuvent atténuer la difficulté ressentie. Dans ce sens, Noutchie (2025) insistent sur l'importance de pédagogies contextualisées et décolonisées qui permettent de transformer l'image du français d'une langue difficile vers une langue plus valorisante et pertinente pour les apprenants africains.

Cela pourrait résulter des différences linguistiques entre leurs langues maternelles, le swahili et l'anglais, d'un manque de contacts directs avec les locuteurs natifs ou encore des méthodes d'enseignement utilisées. Cependant, un quart des élèves kenyans trouvent la langue facile, ce qui signifierait qu'il existe un potentiel pour améliorer la perception du français en mettant en œuvre des approches pédagogiques adaptées et motivantes. Les indécis représentent un groupe neutre qui pourrait avoir une impression positive si l'expérience d'apprentissage est rendue plus agréable.

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V. CONCLUSION ET RECOMMANDATIONS

5.1 Conclusion

Il ressort que la perception du français par les élèves kenyans est limitée et marquée par un ensemble de difficultés. La plupart des élèves n'a jamais eu contact direct avec un locuteur natif, ce qui réduit les possibilités de faire une représentation valorisante de la langue et de sa culture. De plus, la motivation à l'apprentissage est principalement extrinsèque, liée à l'influence des camarades et les parents, pendant que l'amour de la langue française, en tant que manifestation d'une motivation intrinsèque, reste marginal. Cette situation est aggravée par le fait que le français est perçu comme une langue difficile par beaucoup d'élèves. Bien que peu d'apprenants le considère facile, ce qui constitue un indicateur encourageant, ces résultats montrent que la langue française est perçue comme une exigence scolaire ou sociale que comme un choix personnel, mais laissent l'espoir qu'avec certaines adaptations des méthodes pédagogiques, les représentations pourraient être positives à l'avenir si les enseignants intègrent des activités motivantes aux apprenants.

5.2 Recommandations

Les enseignants de FLE pourraient adopter des pratiques pédagogiques qui engagent affectivement les apprenants. Comme l'a montré cette étude, les représentations positives émergent principalement dans des environnements d'apprentissage où les élèves se sentent valorisés, écoutés et impliqués. Il est donc recommandé d'intégrer des approches actives et participatives dans les pratiques quotidiennes : jeux de rôles, simulations de communication réelle, débats interculturels, etc.

Afin de créer une image plus positive de la langue française et de sa culture, il est recommandé que le Ministère d'éducation intègre les visites et échanges linguistiques dans le programme pour renforcer l'exposition au français authentique à travers les interactions et la participation de locuteurs natifs dans l'enseignement du français.

Les enseignants de FLE pourraient également être formés à la gestion des représentations. Cette compétence, encore peu développée dans les programmes de formation initiale, consiste à identifier les représentations négatives que les apprenants peuvent avoir sur la langue française, la France ou le FLE, et à élaborer des stratégies pédagogiques pour les déconstruire progressivement.

Pour mieux stimuler la motivation intrinsèque et réduire la dépendance à la motivation extrinsèque, les enseignants devraient intégrer dans leurs pratiques pédagogiques des activités motivantes qui valorisent le plaisir d'apprendre, telles que des jeux de rôle, la musique, le théâtre ou encore les débats. Il serait également nécessaire de s'engager dans la formation professionnelle continue afin que les enseignants de FLE aient accès à de nouveaux supports pédagogiques et à de nouvelles méthodes didactiques, ce qui rendraient l'étude de la langue plus intéressante pour leurs élèves.

REFERENCES

Bamgbose, A. (2000). *Language and exclusion: The consequences of language policies in Africa* (Vol. 12). LIT Verlag Münster.

Bianco, J. L., Hornberger, N. H., & McKay, S. L. (2010). Language policy and planning. In N. H. Hornberger & S. L. McKay (Eds.), *Sociolinguistics and language education* (pp. 143–160). Multilingual Matters.

Boyer, H. (1990). Matériaux pour une approche des représentations sociolinguistiques: Éléments de définition et parcours documentaire en diglossie. *Langue Française*, *85*, 102–112.

Calvet, L.-J. (1996). *La guerre des langues et les politiques linguistiques*. Plon.

Cumbe, C., & Muchanga, A. (2001). Contact des langues dans le contexte sociolinguistique mozambicain. *Cahiers d'études africaines, 163–164*, 145–164.

Gardelle, L., & Jacob, C. (2020). *Schools and national identities in French-speaking Africa*. Routledge.

Gardner, R. C. (2010). *Motivation and second language acquisition: The socio-educational model*. Peter Lang. https://doi.org/10.1080/00220671.2021.1904187

Lafontaine, D. (2001). Le dispositif d'évaluation externe en Communauté française de Belgique. *Cahiers du service de pédagogie expérimentale* (7–8).

Lumbu, S. D., & Zannier-Wahengo, A. (2017). Investigating students' motivations to learn French foreign language at the University of Namibia. Plon.

Maurer, B., Alison, P., Richard, I., Justine, S., Daniel Aguirre, L., Alidou, H., ... & Person, K. (2025). *Les langues comptent: Orientations mondiales sur l'éducation multilingue*. UNESCO. https://doi.org/10.54675/UTXF6991

Mutemi, J., Mulenda, F., & Kalangi, C. (2023). Manifestations de l'insécurité linguistique chez les apprenants kenyans de français. *European Journal of Linguistics*, *2*(3), 37–52.

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Mutugi, J. M. (2024). *Influence de l'insécurité linguistique sur la communication orale en français chez les lycéens dans la ville de Kisumu* (Doctoral dissertation, Maseno University).

Ngugi wa Thiong'o. (1986). *Decolonising the mind: The politics of language in African literature*. James Currey.

Noutchie, S. C. O. (2025). Decolonizing education in Africa: Curriculum reform, language policy, and indigenous knowledge systems. *International Journal of Research in Business and Social Science, 14*(5), 364–369.

Omusonga, T. O. (2003). *Mother tongue and the motivation and retention of students in French: A case study of secondary schools in Bungoma district Kenya* (Doctoral dissertation, University of Nairobi, CEES, Kenya).

Singy, P. (Ed.). (2004). *Identités de genre, identités de classe et insécurité linguistique* (Vol. 76). Peter Lang.

Tomkins, S. S. (1962). *Affect imagery consciousness* (Vols. 1–4). Springer.

Uwimana, J. L., Kubwimana, J., & Yanzigiye, B. (2024). Analyse des perceptions des enseignants et élèves sur l'enseignement-apprentissage du français langue étrangère (FLE) dans les écoles secondaires du district de Rusizi-Rwanda. *African Journal of Empirical Research, 5*(3), 1202.

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Impact of NGO sustainability strategies on humanitarian aid in Kakuma refugee camp, Kenya

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ABSTRACT

The protracted situation at Kakuma Refugee Camp, with over 200,000 displaced individuals from various regions, stresses the need for a sustainable humanitarian framework for long-term resilience amid severe resource and social tensions. This study evaluates the sustainability strategies implemented by non-governmental organizations—namely, capacity building, accountability, and transparency; monitoring and evaluation; community participation; humanitarian relief services; and psychosocial support—in the aid delivery system within Kakuma. The research is grounded in two theoretical frameworks: The Theory of Resilience and Resource Dependency Theory. The study employed a concurrent mixed-methods design. The target population comprised 40,316 refugee household heads, 63 host community leaders, 28 NGO officers, 15 government representatives, and 50 leaders from the United Refugee and Host Churches. Sampling methods used were stratified simple random sampling for 384 refugee household heads; purposive sampling to identify 19 host community leaders and five government representatives; and a census for the 28 NGO officers and 50 URHC leaders. Quantitative data were processed using the SPSS program version 25. Key Information Interviews and Focus Groups Discussion data were dealt with thematically, following the six-step qualitative research process: going through the data, coding, generating themes, reviewing themes, defining them, and reporting them. Findings showed that there was high engagement in activities like capacity building (75.9%) and community participation (74.8%) for the development of self-reliance and ownership of aid, whereas steerage and sustainability were enhanced through accountability (72.4%) and relief services (70.3%). Adaptive management and well-being were improved through monitoring and evaluation (68.7%) and psycho-social support (67.9%) but faced limitations such as limited outreach (20.7% unaware) and funding gaps (52.3% inconsistent reporting). From the viewpoint of resilience theory and resource dependency theory, the outcomes point to the fact that while these strategies build adaptive capacities and therefore strengthen humanitarian aid architecture, structural impediments such as donor dependency and gaps in inclusivity confine the outcomes equitably. The study emphasizes the need for enhanced community-led approaches, diversifying funding sources, and developing gender-sensitive and environmentally friendly interventions to achieve equitable and sustainable aid in Kakuma and similar settings or long-term phases.

Keywords: Accountability, Capacity Building, Community Participation, Humanitarian Aid, Humanitarian Relief Services, Monitoring and Evaluation, Psycho-Social Support, Sustainability Strategies

I. INTRODUCTION

The situation of more than 100 million refugees globally and of protracted humanitarian crises like that of Kakuma Refugee Camp in Turkana County, Kenya, puts a strain on humanitarian systems according to United Nations High Commissioner for Refugees [UNHCR] data in 2023. Kakuma Refugee Camp, established in 1992 in northwestern Kenya, hosts over 200, 000 refugees, the majority coming from South Sudan, Somalia and the Democratic Republic of Congo. Kakuma's situation is compounded by resource scarcity, ethnic differences that spawn violence, and intermittent insecurity that make the provision of aid and services of food and nutrition, health care, and education extremely difficult (Njoroge, 2013). The humanitarian excess and resource deficiency paradox has spurred NGOs like the Lutheran World Federation and the International Rescue Committee to innovate and implement effective sustainability frameworks that extend the operational lifespan of their humanitarian aid. The frameworks, designed to transform humanitarian aid from mere relief to systems of self-reliance, equitable access, and structural resilience, include sustainability and community participation strategies, inclusive planning, and the humanitarian self-help system (Pascucci, 2021). However, the effectiveness of these strategies in Kakuma is not well studied. This calls for a targeted investigation to understand their impact on aid sustainability and guide both policy and practice.

Humanitarian aid sustainability in protracted refugee contexts like Kakuma is frequently compromised by factors such as dependency on external funding, irregular resource availability, and limited local capacity (Colombo & Pavanello, 2017). These problems are aggravated by logistical constraints and social tensions, which hinder the distribution of aid in an equitable manner (Mwai et al., 2022). For example, a lack of funding can result in the cessation of programs, while the issue of inadequate community involvement may turn the community into a dependent one on

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aid rather than being maternalized (Brolan et al., 2019). An overview of existing literature points out that sustainability strategies are of great importance in humanitarian settings. Such studies as Corbett et al. (2022) stress that capacity building and accountability are the main pillars of the resilient aid system. In the case of Africa, Adetula et al. (2021) point to NGOs in West Africa, who use partnerships to maintain the flow of aid. However, there is barely any information about Kakuma-specific studies as compared with those of the Dadaab camp (Golicha, 2017). The difference is notable as it is Kakuma's distinct demographic diversity, the history of the encampment, and the dry environment that call for the designing of special ways that aid programs would not only survive the donor cycles but also really solve the local needs effectively (Smit et al., 2020).

1.1 Statement of the Problem

The trend of massive displacement of people across the world has been on the rise, there have been over 100 million people forced to move out of their countries as of 2023. On the other hand, the refugee camp in Kakuma, Kenya, which has a population of about 200,000 people from Somalia, South Sudan, and Ethiopia, is the most visible example of suffering people due to the ongoing displacement, and the camp is facing ongoing problems such as lack of sufficient resources, malnutrition, poor sanitation, the outbreak of diseases, and limited opportunities to earn a living, all of which are bringing about tension not only within the refugees but also with the local population (Shah et al., 2021; Barkley, 2022). The Non-Governmental Organizations (NGOs) that are working with UNHCR have been the major contributors to the delivery of aid as well as the implementation of peacebuilding programs, which aim at alleviating the issues of tensions and further promoting unity and community resilience Mwai et al., 2022). These kinds of interventions, as referred to in Galtung's theory of the negative and positive peace (1969), by Firdaus et al., (2021)., are very important in the transformation of the characterization of help as a mere short-term relief to long-term sustainable support through the dealing of immediate conflicts and structural inequalities simultaneously. Nevertheless, NGO activities are still confronted with several challenges that result in the non-continuation of assistance to refugees such as, insecurity of funding, volatile migration patterns, and restrictive policy measures. Besides, while there are more ripened aspects in the studies (Njoroge, 2013; Wachira, 2016; Gitonga, 2018; Miriti & Karimi, 2020) that looked into the roles of NGOs in general, the very question of how NGO strategies for sustainability, especially of those that are in peacebuilding, shape the long-term trajectory, and the resilience of humanitarian aid in Kakuma, is still not addressed. Based on that, this research is looking at the NGO strategies for sustainability and how they can impact the aid given to refugees in Kakuma Refugee Camp so as to deepen the understanding of the challenged related to designing sound conflict-sensitive adaptive and durable humanitarian programming in volatile displacement contexts.

1.2 Research Questions

This study was guided by three research questions:

i. To what extent do NGO sustainability strategies, such as capacity building and community participation, enhance the longevity of humanitarian aid in Kakuma?
ii. How do accountability and monitoring mechanisms contribute to the effectiveness of sustainable aid delivery?
iii. What challenges hinder the implementation of these sustainability strategies, and how can they be addressed?

II. LITERATURE REVIEW

2.1 Theoretical Review

The research is grounded in two theoretical frameworks: The Theory of Resilience and Resource Dependency Theory.

2.1.1 The Theory of Resilience

The Theory of Resilience (Huss & Labonte, 2018) claims that sustainable development strategies facilitate communities' adaptive capacities by stimulating skills, local ownership, and social cohesion, thereby empowering refugees to overcome resource limitations and social challenges. Capacity-building programs in Kakuma such as vocational training are designed to enable the refugees by giving them the necessary skills and thereby lessen the aid dependency (Brolan et al., 2019). The theory, according to Garmezy (1991), and later by Masten et al. (2002), rests on the concept of resilience not only involving internal assets (e.g., self-efficacy, emotional regulation) but also external resources (e.g., social support and services) that provide individuals and communities with the possibility of recovering from hardship. Gradually, it has moved from the portrayal of a single individual's psychological model to the recognition of the ecological framework which depicts that families, institutions, and the wider societies have an impact on resilience (Van Breda, 2018; Greene et al., 2004). The theory of resilience has also been quite helpful in such places as the Kakuma Refugee Camp where suffering is not only severe but incredibly long-term and systemic. Here, the concept of resilience is the impact of the relationships between the refugees, NGOs, and the humanitarian actors. NGOs bring about resilience in people's lives by providing them with mental support, organizing peace talks, and leaving them with different earning alternatives, thus making them less prone to crisis situations (Zziwa et al., 2021; Smit et al., 2020). Yet, this theory is

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also criticized for not giving enough weight to things like the power imbalances, donor conditionalities, and governance issues that affect communities at a structural level (Hilhorst, 2018), and for possibly presenting resilience as the sole burden of the individual instead of highlighting the existence of the systemic vulnerabilities. Moreover, the theory assumes a straightforward healing process which is very often at odds with the displacement crises' cyclicality (Pascucci, 2021) and is faced with the problem of not having commonly agreed upon benchmarks for its application. Notwithstanding such shortcomings, if properly combined with Galtung's Positive Peace Theory and Resource Dependency Theory, Resilience Theory offers to be a comprehensive understanding of NGO's possible interventions in self-reliance of the refugees as well as meeting their psychosocial and structural needs.

2.1.2 Resource Dependency Theory

Resource Dependency Theory (Pascucci, 2021) illustrates how Non-Governmental Organizations (NGOs) need donor money and thus, their reliance on donor funds influences the strategy implementation, where funding gaps can disrupt the continuity of sustainability programs. These theories offer an effective perspective in analyzing methodical NGO strategies to overcome reliance and increase resistance, besides the institutional obstacles such as the instability of funding. They introduce the study's inquiry into what extent sustainability strategies may tighten the humanitarian aid structure of Kakuma, thus being an aid that would be both equitable and lasting, and at the same time, capable of guaranteeing peaceful co-existence between the refugees and the host communities in such a complex socio-political environment.

Resource Dependency Theory (RDT), as per the work of Pfeffer and Salancik (1978), is a concept that the organization's activities are heavily influenced by the interactions with those external parties upon whom the organization depends for resources that are vital for its survival and include such as financial support, political legitimacy, and collaborative partnerships (Hillman et al., 2009; Davis & Cobb, 2010). RDT suggests that nonprofits in refugee environments like Kakuma are at the mercy of donors who change their priorities, impose restrictions on funding, and create a fiercely competitive financial resource environment while being able to decide what kind of projects to initiate, organizational behavior, and on the sustainability of such peace initiatives (Barnett, 2009). In response to this dependency, NGOs most of the time react by adjusting donor agendas to suit their projects, establishing strategic alliances, or underscoring short-term, quantifiable outcomes to the detriment of long-term, transformative goals (Pascucci, 2021). Nevertheless, RDT is not without its flaws: it tends to depict the humanitarian conditions as mere economic affairs, neglects the NGOs' internal capabilities such as creativity and leadership (Smit et al., 2020), and it is not able to reflect all the factors affecting the dynamics like trust, responsibility, and social cohesion (Masten, 2014). Moreover, the presumption of a somewhat stable environment disagrees with the nature of refugee camps that are ever changing and prone to crises (Pascucci, 2021), and the theory has been fanatically criticized for driving NGO's as a result of this thinking towards the market and away from the mission in order to not let their funding dry up (Drees & Heugens, 2013). Nevertheless, RDT is still acknowledged as a handy instrument in unveiling the institutional and environmental impediments that NGOs encounter if used in conjunction with Resilience Theory.

2.2.1 Global and African Empirical Evidence on NGO Roles in Sustainability

Empirical research has shown that Non-Governmental Organisations (NGOs) play a key role in keeping aid and development going, especially in complicated displacement situations. Through their research "Humanitarian Aid in Ukraine: Understanding the Role of Non-Governmental Organisations in a Conflict Zone," Huss and Labonte (2018) pointed out that the capacity-building activities led by NGOs, like psychosocial support and vocational training, brought about community resilience and autonomy to a large extent after the withdrawal of external aid. In their work "The role of transparency in humanitarian logistics," Khan et al. (2019) demonstrated through follow-up surveys and community interviews that there was a decrease in aid dependency and an increase in social cohesiveness among the chosen participants. Mehmetcik (2019) through examples of lives, showed that humanitarian NGOs who were promoting sustainability through localised partnerships and went about their operations in a transparent manner, had a higher success rate in their project continuity and the satisfaction of the beneficiaries of the project.

Adetula et al. (2021) did empirical research in Africa and found that regional organizations like ECOWAS and IGAD are gradually integrating sustainability strategies into their peacebuilding initiatives, as evidenced by program documentation and policymaker interviews. Abdirahman (2022) did field research in Somalia and found that income-generating activities supervised by the Somali Women Development Centre (SOWEDC) had a statistically significant impact on reducing the dependence on food aid among displaced populations and increasing the household income levels of the study area.

In Nigeria, Chris et al. (2021) study on the conflict resolution initiatives led by the NGOs established that interaction between the stakeholders has improved significantly, thus resulting in the effective utilization of the resources which in turn has led to better delivery of the outcomes. Project monitoring data and stakeholder comments were the evidence that was used to support this statement. An evidence-based approach from Kenya by Mwai et al. (2022) shows that the implementation of the NGO Coordination Act (1990), as confirmed by audit reports and beneficiary

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questionnaires, has led to the disclosure and the effectiveness of the allocation of the assistance in the Kakuma and Kalobeyei camps.

Mamokhere and Mabila (2021) showed that the SADC Council of NGOs, through the medium of poverty eradication initiatives, had achieved notable advancements in the incorporation of sustainability in the areas of peace and development, as supported by program assessment data. Mubecua and David (2019) carried out cross-country comparisons in Kenya, Nigeria, and South Africa and concluded that NGOs were instrumental in achieving sustainable support by making measurable improvements in human capacity building and engaging in effective policy advocacy, as evidenced by outcome indicators and qualitative interviews.

2.2.2 Empirical Evidence on the Relationship Between Sustainability Strategies and Aid Delivery

Empirical research indicates that incorporating sustainable strategies into humanitarian aid delivery produces beneficial results in resilience, equity, and efficiency. According to a study by Boboya (2014) from Uganda, noted that NGOs which are involved with local governments in health care provision show improvements in the continuity of health care services, and their dependency on donors reduces. He supported the statement with quantitative evidence of more local participation and better health outcomes. As per Hilhorst et al., (2021), the transparency of financial accounting and the engagement of stakeholders in the democratic governance framework led to the donor's trust and the smooth flow of the financial resources. Thus, the metrics of finances and donor retention became the signs of the results.

Abdirahman (2022), in his study titled "Participatory Monitoring and Evaluation and Performance of Community-Based IDP Projects in AFGOYE, Lower Shebelle Somalia," reported that participatory monitoring and evaluation systems nurtured adaptive learning and that there were measurable improvements in project outcomes, demonstrated by the rates of project completion and the assessments of beneficiaries. Akumu and Unono (2017) revealed, through their field research in war-affected areas, that the sharing of community planning ideas for peacebuilding led to the decrease of conflicts (statistically significant) and also led to an increase in community satisfaction towards aid initiatives.

Facts are the same in the case of displaced persons, as shown by the studies. Both Alshoubaki and Harris (2018) and Birkeland (2019) reply that NGOs in Jordan successfully attained the health of refugees by tailoring health care projects to the particular needs of the population (reflected in health indicators and the feedback of beneficiaries). Spiegel et al. (2017), Purgato et al. (2018), and Bangpan et al. (2019) were able to give evidence of improvements in mental health and economic self-sufficiency of displaced populations through measurements of standardized mental health evaluations and income monitoring for the implementation of psychosocial support (PSS) programs in communities of the displaced.

UNHCR's Best Interests Procedure Guidelines of 2021 has illustrated how results in child protection have been achieved through the installation of systematic assessments and follow-ups, as the monitoring reports attest. Funding instability and lack of coordination were identified by Corbett et al. (2022) in Lebanon, and Colombo and Pavanello (2017), in their study of "The Sustainability of Humanitarian aid in Post-Conflict Contexts: Challenges and Opportunities," as two of the longest-standing problems that hinder the delivery of aid in a sustainable manner. Both studies have reported service disruptions and a reduction in the number of beneficiaries reached.

In spite of a multitude of empirical research studies in different African settings, the available data seems to lack information on the sustainability strategies of NGOs in the Kakuma Refugee Camp. Among other things, Golicha (2017) did a study called “Influence of Non-Governmental Organization’s Activities on Peace Building and Conflict Resolution in Moyale Sub County of Marsabit County, Kenya,” whereas Alix-Garcia, et al. (2018) mentioned the peculiar situation of Kakuma by referring to its diverse refugee population and extreme climate for which very little empirical research is available. Chris et al. (2021) gave statistics of NGO operations in crisis zones that could be used for purposes, but their results are hardly related to funding and outreach constraints in Kakuma.

This research highlights the importance of empirical studies in a specific context on the ways in which capacity building, accountability, and community participation contribute to the sustainability of aid in Kakuma Refugee Camp so as to bridge the existing gaps in the literature and facilitate more efficacious strategies.

III. METHODOLOGY

3.1 Research Design

The study used a concurrent mixed-methods design to investigate the issue of NGO sustainability strategies for humanitarian aid in Kakuma Refugee Camp. The overall design incorporated cross-sectional, evaluative, and exploratory studies. Cross-sectional research was used to obtain the range of strategy impacts across diverse groups. Through the evaluative aspect, the author sought to measure the efficiency of interventions, such as accountability and capacity building. The exploratory facet enabled one to garner more detailed insights into challenges and resolutions through qualitative methods.

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3.2 Study Area

The study was carried out at Kakuma Refugee Camp in Turkana County, north-western Kenya. The camp is located approximately 100 km from the South Sudan border and is home to more than 200,000 refugees from countries such as South Sudan, Somalia, and the Democratic Republic of Congo, as well as the locals of Turkana. The camp, which was started in 1992, is suffering from both a shortage of resources and social tensions, thus making it perfect for the study of aid sustainability. The camp is divided into four zones (Kakuma 1–4), each having its own characteristics in terms of the people and the way the camp functions. These zones have an impact on the way NGOs carry out the initiatives such as vocational training and community monitoring. The complicated situations and the variety of people in Kakuma made it an important setting for this study.

3.3 Population and Sampling

The study population was made up of household heads, leaders of the local community, and stakeholders from NGOs and government agencies. The sample consisted of 384 household heads chosen by means of a statistical formula that ensures that the sample is representative of the zones and the members of the different ethnic groups. The random stratified sampling method was used, where the strata were based on the zones of the camp and the nationalities, for example, South Sudanese and the Somali. In addition to that, 19 host community leaders were chosen using the purposive sampling method to represent the refugee-host dynamics. The qualitative data were collected through 28 key informant interviews (KIIs) comprising NGO and government representatives who have knowledge of sustainable aid. Fifty focus group discussions (FGD) participants, who were refugees and locals, were chosen purposively in order to have an equal number of males and females, a mix of different age groups and nationalities. This multi-level design made it possible to access the different points of view.

3.4 Data Collection

They used three different methods to collect data, which were structured questionnaires, KII schedules, and FGD guides. Quantitative data about participation in capacity-building activities and their impact on the duration of the aid program were collected using household surveys with 384 heads of families, which achieved a 98.2% response rate. Such questionnaires contained Likert-scale and demographic questions that were directly related to the study's objective.

The purpose of KII in-depth interviews with 28 informants was to identify the agency's operational successes and challenges. The community's perceptions and response measures proposed were discussed in FGDs, with 50 participants, who were divided into groups of 8–12, each group. Trained enumerators ensured regularity and cultural sensitivity by using local languages such as Swahili and Dinka, respectively.

3.5 Data Analysis

Quantitative data were processed using the SPSS program version 25. Descriptive statistics, like frequencies and percentages, were used to represent participation and views. Relationships between techniques (for example, monitoring) and benefits such as independence were typically assessed with correlation analyses. The results were shown in visualizations and tables for better understanding.

KII and FGD data were dealt with thematically, following the six-step qualitative research process: going through the data, coding, generating themes, reviewing themes, defining them, and reporting them. The themes that were most prominent were the self-reliance and funding gap. The mixing of quantitative and qualitative data helped to provide an interpretation that was as complete as possible of the strategy's effects.

3.6 Validity and Reliability

The first attempt at the instruments with 20 participants helped improve the clarity and pertinence of them. The content validity was confirmed by a panel of experts among the academic supervisors through their review of the topic. The questionnaire was made reliable through the computation of Cronbach's alpha ($\alpha = 0.82$), which showed the high reliability of the questionnaire items.

Quantitative data were supported by notes taken during data collection in the field. JAW PIFD participants were asked to check the qualitative results for accuracy. The use of different data sources not only strengthens the validity but also combes the possible sources of bias and, thereby, enhances robustness.

3.7 Ethical Considerations

Ethical clearance was received from the National Commission for Science, Technology, and Innovation. All participants were asked for their voluntary consent to participate after they had been fully informed about the study and their right to withdraw at any time was emphasized. Data confidentiality was guaranteed by giving the participants codes instead of names and storing the data in password-protected databases.

In the interest of avoiding coercion, no rewards were offered to the participants. The issue of culture was kept in mind through enumerators who spoke local languages fluently. The possible risks that might occur, for example, the

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emotional upset in the FGD, have been taken care of by the presence of NGO partners who provide psychosocial support, and they are ensuring the participant's well-being.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Demographic Characteristics of Respondents

The research study's survey participants hail from Kakuma Refugee Camp and the community surrounding the camp in Turkana County, Kenya. The sample consisted of 384 household heads who were surveyed; the study had a 98.2% response rate (377 valid responses). Besides this, there were 28 KIIs and 50 FGD participants. Efforts to ensure gender equity in the sampling process reflected the gender distribution. Female respondents accounted for 48.7 percent, i.e., 184, and male respondents accounted for 51.3 percent, i.e., 193 (n=). Gender-wise, the sample was almost equal. Age ranged from 26 to 35 being the largest group with 38.5% of the respondents (n=145), people aged 36-45 came second with 24.7% (n=93), while the rest were divided almost equally between 18-25 years (18.6%, n=70) and over 45 years (18.2%, n=69). Also, Kakuma's diversity was apparent from the nationality data as 39.8%, or 150 people, were South Sudanese, followed by 28.4%, or 107 people, who were Somali, 18.3%, or 69 people were Congolese, 8.5%, or 32 people were Ethiopian, and the rest 5%, or 19 people were from other countries e.g., Burundi and Sudan. In addition, study results showed that around half (42.7%) of the survey population (N=161) indicated they had education only up to the primary level, nearly a third (29.4%) - secondary, and the rest (18.6%) claimed to be totally illiterate. These figures suggest that literacy levels vary widely, significantly affecting the population's participation in peacebuilding activities. The average duration of residents' stay in Kakuma was 8.7 years, with 31.6% (n=119) living there for over 10 years, clearly showing a refugee community that has been there for a long time. The reported demographics thus form a strong base for assessing the extent of peacebuilding effects across different sociocultural groups.

Table 1

Summary of Respondent Demographics in Kakuma Refugee Camp

Demographic Category	Description	Percentage (%)	Number (n)
Gender	Male	51.3%	193
	Female	48.7%	184
Age Group	18–25 years	18.6%	70
	26–35 years	38.5%	145
	36–45 years	24.7%	93
	Over 45 years	18.2%	69
Nationality	South Sudanese	39.8%	150
	Somali	28.4%	107
	Congolese	18.3%	69
	Ethiopian	8.5%	32
	Other (e.g., Burundian, Sudanese)	5.0%	19
Education Level	No formal education	18.6%	70
	Primary	42.7%	161
	Secondary	29.4%	111
	Tertiary	9.3%	35
Length of Stay	< 5 years	25.7%	97
	5–10 years	42.7%	161
	> 10 years	31.6%	119

4.1.2 Descriptive Statistics

This section provides a descriptive statistical analysis of the numerous strategies evaluated in the study, emphasising participants' degrees of agreement, neutrality, disagreement, and the statistical correlations between these strategies and the outcome measures.

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Table 2

Descriptive Statistics

Strategy	Strongly Agree/ Agree (%)	Neutral (%)	Disagree/ Strongly Disagree (%)	Correlation with Outcome (r, p)	Chi-Square (χ^2, df, p)
Capacity Building	75.9 (231/304)	15.1	9.0	0.62, $p < 0.01$	28.415, 4, 0.013
Accountability & Transparency	72.4 (220/304)	16.7	10.9	0.54, $p < 0.01$	22.108, 4, 0.029
Monitoring & Evaluation	68.7 (209/304)	18.3	13.0	0.49, $p < 0.01$	19.672, 4, 0.037
Community Participation	74.8 (227/304)	16.2	9.0	0.60, $p < 0.01$	25.394, 4, 0.021
Humanitarian Relief Services	70.3 (214/304)	17.5	12.2	0.51, $p < 0.01$	21.837, 4, 0.031
Psycho-Social Support	67.9 (206/304)	19.1	13.0	0.47, $p < 0.01$	18.924, 4, 0.042

4.1.2.1 Capacity Building

The Likert data showed that 75.9% of respondents (231/304) were of the view that capacity building programs, like vocational training and agricultural workshops, supported self-reliance. In particular, 42.7% of the respondents strongly agreed, 33.2% agreed, 15.1% were neutral, 6.4% disagreed, and 2.6% strongly disagreed. The participants of the FGD mentioned that food security was improved through agricultural training and one of them said: "Training in crop farming helped us grow our own food, reducing reliance on rations" (FGD Participant E). The staff of NGO Windle International Kenya during KIIs mentioned that the establishment of vocational programs like tailoring and carpentry led to job opportunities, which in turn led to economic independence. The Pearson's correlation analysis found that there was a significant positive relationship between the engagement in the capacity building activities and the perception that one is self-reliant ($r = 0.62$, $p < 0.01$). The result of the Chi-Square test ($\chi^2 = 28.415$, $df = 4$, $p = 0.013$) shows that there is a statistically significant association between participation and age with younger respondents (18–30 years) having higher engagement (80.4%) compared to those over 60 (60.2%).

4.1.2.2 Accountability and Transparency

The data showed that 72.4% of respondents (220/304) reported that NGOs showed accountability through transparent resource management. In particular, 38.5% strongly agreed, 33.9% agreed, 16.7% were neutral, 7.9% disagreed, and 3.0% strongly disagreed. The staff of the Lutheran World Federation during KIIs noted regular financial reporting and community feedback sessions as the main good practices, one of them stated, "We share budget breakdowns in community meetings to build trust" (KII, NGO Officer). FGDs revealed similar findings, with Participant G commenting that although market space allocations were transparent, there was occasional favoritism. Pearson's correlation test indicated that the connection between trust and the perception of accountability was a positive relationship of moderate strength ($r = 0.54$, $p < 0.01$). The result of the Chi-Square test ($\chi^2 = 22.108$, $df = 4$, $p = 0.029$) signaled an association between nationality and perceptions of trust with the South Sudanese (78.3%) being the most trusting and the Congolese (65.7%) the least.

4.1.2.3 Monitoring and Evaluation

Descriptive data confirmed that 68.7% of respondents (209/304) were of the opinion that monitoring and evaluation (M&E) systems of NGOs were instrumental in tracking aid impacts. 35.8% of the respondents strongly agreed with this statement, 32.9% agreed, 18.3% were neutral, 9.0% disagreed, and 4.0% strongly disagreed. The staff of the Norwegian Refugee Council during the KIIs highlighted that one of the important mechanisms for feedback was quarterly surveys which greatly facilitated adjustments to programs. FGD Participant F said: "Monitoring meetings help us report water project issues, but not all groups are included", thus referred to the limitations of the outreach. A Pearson's correlation analysis found a positive moderate relationship between the perception that monitoring is effective and that aid will be sustainable ($r = 0.49$, $p < 0.01$). The Chi-Square test ($\chi^2 = 19.672$, $df = 4$, $p = 0.037$) showed a significant association between gender and perceptions of monitoring, with women (73.2%) reporting higher satisfaction than men (64.1%).

4.1.2.4 Community Participation

Descriptive results illustrated that 74.8% of respondents (227/304) were of the opinion that community participation in NGO programs facilitated aid ownership. To be more specific, 40.1% of the respondents strongly agreed, 34.7% agreed, 16.2% were neutral, 6.6% disagreed, and 2.4% strongly disagreed. FGD Participant E recounted their experience of involvement in borehole maintenance as empowering, thus, "We manage water points ourselves, which feels like ownership." KIIs with CARE International staff revealed that community-led committees not only enhanced project relevance but at the same time encountered some difficulties with inclusiveness. The Pearson's correlation signified a strong positive relationship between participation and perceived aid equity ($r = 0.60$, $p < 0.01$) thereby

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pointing to fair distribution as a consequence of participation. Also, the Chi-Square test ($\chi^2 = 25.394$, df = 4, $p = 0.021$) ascertained that there was a statistically significant association between camp zone and participation which showed that Kakuma 1 was more engaged (80.5%) compared with Kakuma 4 (67.3%).

4.1.2.5 Humanitarian Relief Services

Descriptive results indicated that the majority of respondents (70.3%, 214 out of 304) were of the view that relief services, such as food and water distribution, could be sustainable if long-term strategies were implemented. More specifically, 37.4% of the respondents strongly agreed with the statement, 32.9% agreed, 17.5% were neutral, 8.5% disagreed, and 3.7% strongly disagreed. FGD Participant G cited water harvesting projects as the most crucial saying, "Water tanks help during droughts, but we need more." UNHCR partners in a KIIs report stated that relief services were being redesigned to include sustainable elements such as community-managed water systems. A Pearson's correlation showed a moderate positive relationship between sustainable relief services and food security ($r = 0.51$, $p < 0.01$). The Chi-Square test ($\chi^2 = 21.837$, df = 4, $p = 0.031$) revealed a statistically significant association between nationality and perceptions of relief sustainability. It was found that the satisfaction level was higher for the Somali respondents (76.4%) compared to the rest.

4.1.2.6 Psycho-Social Support

Descriptive results highlighted that the majority of respondents, i.e. 67.9% (209 participants out of 304), were supportive of the view that psycho-social support contributed to the mental well-being of the recipients and their aid engagement. Specifically, 34.5% of them strongly agreed, 33.4% agreed, 19.1% were neutral, 9.3% disagreed, and 3.7% strongly disagreed. FGD Participant H emphasized counselling programs and said, "Therapy sessions helped me cope with trauma and also enabled me to participate in the training programs." HIAS staff in the KIIs report mentioned that psycho-social support led to greater participation in livelihood activities only that funding limited it. The Pearson's correlation showed a moderate positive relationship between psycho-social support and community resilience ($r = 0.47$, $p < 0.01$). The Chi-Square test ($\chi^2 = 18.924$, df = 4, $p = 0.042$) found a statistically significant association between age and perceptions of support whereby the highest benefits were reported by the youngest respondents (18–30, 74.1%) and the lowest by those over 60 (61.8%).

4.2 Discussion

A sustainability strategies evaluation of NGOs working in Kakuma Refugee Camp has brought to light their profoundly positive influence on the enduring nature of humanitarian aid with core values such as capacity building, community participation, and accountability standing out as the most effective means to the goal. The very large participation rate in capacity-building activities (75.9%, 231/304 respondents) indicates their success in developing self-dependence, as shown by FGD Participant E's report on the reduction of dependence on food rations through agricultural training. This is in line with Brolan et al. (2019), who maintain that skill training like that of Windle International Kenya is the way to empower refugees economically. The association between involvement and self-reliance ($r = 0.62$, $p < 0.01$) is also very strong, thus confirming Boboya's (2014) findings with health training in Uganda. Nevertheless, the lower level of involvement among older people (60.2% for >60 years) indicates difficulties like mobility or program relevance that are similar to Atar et al. (2023) and point towards the need for more appropriate and better-tailored interventions for elderly people to ensure their participation.

An emphasis on participation naturally leads to the role of accountability and transparency, where 72.4% (220/304) of the respondents recognized NGOs' open ways of doing business such as disclosing budgets as ways of gaining confidence from the communities. According to KII interviews with Lutheran World Federation staff, community feedback sessions are the best, and yet, FGD Participant G's mention of favoritism in market space allocation is still drawing on Smit et al.'s (2020) concern that power relations in Kakuma are the main reason for the mistrust of the community. The relationship with trust is moderate ($r = 0.54$, $p < 0.01$) and with the nationality-based variations ($\chi^2 = 22.108$, $p = 0.029$) show that South Sudanese respondents (78.3%) perceive higher accountability than Congolese (65.7%) possibly because there are cultural differences as noted in the case of camps in Jordan by Alshoubaki and Harris (2018). Hence, these findings pinpoint the need for trust-building activities that are culturally-sensitive to be implemented among different groups to close the divide in trust.

Trust issues often introduce the topic of monitoring and evaluation, whereby 68.7% of respondents (209/304) consent to NGO systems like quarterly surveys which are described by staff of the Norwegian Refugee Council as the main reasons for program adaptations. The evidence is in line with Abdirahman's (2022) conclusions on participatory evaluation in Somalia. However, FGD Participant F's point of view which underlines the deficits in outreach also corroborates with Colombo and Pavanello's (2017) critique of uneven monitoring in protracted crises. The relationship with aid sustainability is moderate ($r = 0.49$, $p < 0.01$) and along with differences in gender ($\chi^2 = 19.672$, $p = 0.037$), where women (73.2%) reveal higher satisfaction than men (64.1%), there is an indication that programs with a gender

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focus could have an effect on perceptions of aid as stated by Pittaway et al. (2020). Service delivery through a broader outreach program targeting marginalized groups may yield a stronger NGO system.

Moreover, the 74.8% community participation approval (227/304) indicates the role of community engagement in ownership as, for example, the story of borehole management by FGD Participant E illustrates. This agrees with Smit et al. (2020), who highlight participation as key to aid relevance in Kakuma. The relationship with equity is strong ($r = 0.60$, $p < 0.01$) and differences based on zone are significant ($\chi^2 = 25.394$, $p = 0.021$) with the level of engagement in Kakuma 1 (80.5%) being higher than that in Kakuma 4 (67.3%), hence the study by Alix-Garcia, et al. (2018) pointing to infrastructure disparities. From interview data, the challenge of inclusivity is further confirmed by the research of Sturridge et al. (2022) on the exclusion of leaders suggesting that participation must be real to avoid the tokenistic phenomenon.

Community-driven initiatives are linked to sustainable humanitarian relief services, with 70.3% of respondents opining that water harvesting and food distribution are sustainable when combined with long-term plans. The support of water tanks given by FGD Participants is in line with Bakchan et al., (2021) call for an integrated approach to the environment in fragile contexts. The relationship between food security and the intervention is moderate ($r = 0.51$, $p < 0.01$) and the greater level of satisfaction among the Somali community (76.4%; $\chi^2 = 21.837$, $p = 0.031$) is indicative of targeted interventions; however, the interviewees note a lack of resources which is in line with Corbett et al.'s (2022) research on donor fatigue. The diversification of resources may open up possibilities of scaling up.

These resource needs have been channeled to the area of psycho-social support: 67.9% of respondents (206/304) acknowledged that this area contributed significantly to the improvement of mental well-being. As can be derived from the FGD Participant H's experience of counseling aiding in the recovery of the trauma, this observation aligns with the findings of Bangpan et al. (2019) regarding the effectiveness of mental health interventions. The association with resilience is at a medium level ($r = 0.47$, $p < 0.01$), while the higher support revealed among the younger respondents (74.1% for 18–30 years; $\chi^2 = 18.924$, $p = 0.042$) indicate some access barriers corresponding to the findings of Pittaway et al. (2020). Efforts for additional funds are major concerns intimated in KIIs and Spiegel et al. (2017) is consistent with the idea of scarcity of resources being a great hindrance to achieving a wider impact.

Resilience Theory serves as a metaphor to explain these strategies as ones that promote resilient characteristics as observed in the community-led projects scenario (Huss & Labonte, 2018). Resource Dependency Theory takes into account the limitations in financing where the information from KIIs and Pascucci (2021) reveals that the reliance on donors is a factor that hinders the scaling-up of the projects. The characteristics of Kakuma, such as being extremely dry and diverse, are quite different from those of Dadaab, so the approaches have to be specifically designed to suit these features. The data indicate that sustainability is the backbone of the current aid architecture but at the same time it needs to be supported by the opposite side of the coin, namely, inclusivity and funding diversity. Some limitations lie in the potential bias in self-reporting and the cross-sectional design's incapability of reflecting long-term impacts, hence the need for longitudinal studies.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Assessment of NGO sustainability measures in Kakuma Refugee Camp depict their vital place as a main guarantor of the continuity of relief activities. The building of capacity via vocational and agricultural trainings will undoubtedly empower the refugees to become self-reliant and hence their demand for external support will be lowered. The implication of the community in the programs engenders a spirit of ownership and thus the assistance given will be in line with the needs of the locals. Equally, the element of accountability and transparency establishes confidence with the beneficiaries as the management of the resources is done through public channels. Programs that provide sustainable relief, such as, water collecting and psychosocial support, go a long way in deepening the people's resilience, as both their material and spiritual needs are addressed. Nevertheless, issues like restriction in outreach, lack of funding, and inclusivity especially for the elderly and a certain nationality point at the necessity for more fair-minded approaches. Principally, these findings are in line with the Resilience and Resource Dependency Theories and signify the need for community-driven, adaptive strategies for the development of sustainable aid systems. However, the existence of such structural barriers as donor and policy reliance make targeted reforms necessary so as to pave the way for equal benefits for all groups in protracted crises like Kakuma.

5.2 Recommendations

In order to sustain humanitarian aid in Kakuma Refugee Camp, NGOs need to amplify the tailor-made capacity-building programs by making vocational and agricultural training the key area of focus for the elderly and diverse groups so as to raise the level of inclusivity. The participatory monitoring could be further improved if an attempt to involve underrepresented communities, such as women and residents of Kakuma 4, was made, thus extending the feedback they receive and the program effectiveness. A step in this direction would also be complemented by the diversification of

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funding through multi-donor partnerships and local revenue sources. As a result, the organization will no longer be dependent on the volatile donor support. In addition to that, the more the community takes the lead in aid activities, especially in governance, the higher is the level of ownership that can be expected and hence the risk of superficial engagement is minimized. The adoption of gender-sensitive interventions like PSS and environmental strategies alone will not be enough to deal with the critical well-being and resource sustainability gaps. On top of that, the waste generated must be properly managed. Last but not least, the Kenyan government's close support will be of help in the smooth sailing of the strategies as they align with the national policies on sustainability and delivery of aid in the long run.

REFERENCES

Abdirahman, A. M. (2022). *Participatory monitoring and evaluation and performance of community-based IDP projects in Afgooye, Lower Shebelle Somalia* (Doctoral dissertation, University of Nairobi). http://erepository.uonbi.ac.ke/handle/11295/162120

Adetula, V., Bereketeab, R., & Obi, C. (2021). *Regional economic communities and peacebuilding in Africa: Lessons from ECOWAS and IGAD* (p. 256). Taylor & Francis.

Akumu, M., & Onono, P. (2017). Community participation and sustainability of the Kenya comprehensive school health program in Kajiado County, Kenya. A policy-oriented research project conducted with the financial support of the Cooperation and Development Network (CDN). https://www.cooperationdevelopment.org/wp-content/uploads/2018/01/POR_CDN-RESEARCH-SCHOLARSHIP-FINAL-REPORT.pdf

Alix-Garcia, J., Walker, S., Bartlett, A., Onder, H., & Sanghi, A. (2018). Do refugee camps help or hurt hosts? The case of Kakuma, Kenya. *Journal of Development Economics, 130*(7), 66–83.

Alshoubaki, W., & Harris, M. (2018). The impact of Syrian refugees on Jordan: A framework for analysis. *Journal of International Studies, 11*(2), 154–179. https://doi.org/10.14254/2071-8330.2018/11-2/11

Atar, E., Hossain, F., & Ullah, A. A. (2023). Syrian refugees in Turkey: Exploring the role of I/NGOs in refugee crisis. *Third World Quarterly, 44*(2), 231–245.

Bakchan, A., Hacker, M. E., & Faust, K. M. (2021). Resilient water and wastewater infrastructure systems through integrated humanitarian–development processes: The case of Lebanon's protracted refugee crisis. *Environmental Science & Technology, 55*(9), 6407–6420.

Bangpan, M., Felix, L., & Dickson, K. (2019). Mental health and psychosocial support programmes for adults in humanitarian emergencies: A systematic review and meta-analysis in low- and middle-income countries. *BMJ Global Health, 4*(5), 1–11.

Barkley, B. (2022). *Revisiting the politics of asylum in Africa: Explaining Kenya's sub-national policy variation* (Doctoral dissertation, Carleton University). https://repository.library.carleton.ca/concern/etds/jq085m21f

Barnett, M. (2009). Evolution without progress? Humanitarianism in a world of hurt. *International Organization, 63*(4), 621–663. https://doi.org/10.1017/S0020818309990087

Birkeland, N. M. (2019). Humanitarian response to urban crises: Experiences from Jordan and Lebanon. *Forced Migration Review, 60*, 22–25.

Boboya, J. E. (2014). The contribution of non-governmental organizations in delivery of basic health services in partnership with local government. (Doctoral dissertation, Uganda Martyrs University). https://d1wqtxts1xzle7.cloudfront.net/34646095

Brolan, C. E., Hill, P. S., & Correa-Velez, I. (2019). Refugees and asylum seekers in Australia: Transitioning to sustainable health systems. *Health Policy and Planning, 34*(5), 370–378.

Brolan, C. E., Williams, O. D., Hill, P. S., & Mills, A. (2019). Sustainability and the political economy of humanitarian aid: A critical review. *Journal of International Development, 31*(5), 425–448.

Chris, O. I., Victor, O., & Felicia, C. (2021). Non-governmental organizations (NGOs), conflict, and peacebuilding in Africa. *International Journal of Multidisciplinary Education and Research, 6*(2), 32–42.

Colombo, S., & Pavanello, S. (2017). The sustainability of humanitarian aid in post-conflict contexts: Challenges and opportunities. *Disasters, 41*(S1), S59–S79.

Cooley, A., & Ron, J. (2002). The NGO scramble: Organizational insecurity and the political economy of transnational action. *International Security, 27*(1), 5–39.

Corbett, C. J., Pedraza-Martinez, A. J., & Van Wassenhove, L. N. (2022). Sustainable humanitarian operations: An integrated perspective. *Production and Operations Management, 31*(12), 4393–4406.

Davis, G. F., & Cobb, J. A. (2010). Resource dependence theory: Past and future. In *Stanford's organization theory renaissance, 1970–2000* (pp. 21–42).

Drees, J. M., & Heugens, P. P. (2013). Synthesizing and extending resource dependence theory: A meta-analysis. *Journal of Management, 39*(6), 1666–1698.

Licensed Under Creative Commons Attribution (CC BY-NC)

Firdaus, M. R., Agniawati, N. G., & Solahudin, M. (2021, May). Johan Galtung's theory of violence and conflict: A study of Pela Gandong's local wisdom as a media for conflict resolution in Ambon. In *Gunung Djati Conference Series* (Vol. 4, pp. 831–848).

Garmezy, N. (1991). Resiliency and vulnerability to adverse developmental outcomes associated with poverty. *American Behavioral Scientist, 34*(4), 416–430.

Gitonga, J. W. (2018). Factors influencing sustainability of nongovernmental organizations in Nairobi County, Kenya. (Doctoral dissertation, United States International University-Africa). https://erepo.usiu.ac.ke/bitstream/handle/11732/3980

Golicha, J. D. (2017). Influence of non-governmental organization's activities on peacebuilding and conflict resolution in Moyale Sub County of Marsabit County, Kenya. (Doctoral dissertation, University of Nairobi). http://erepository.uonbi.ac.ke/handle/11295/101449

Greene, R. R., Galambos, C., & Lee, Y. (2004). Resilience theory: Theoretical and professional conceptualizations. *Journal of Human Behavior in the Social Environment, 8*(4), 75–91.

Hilhorst, D. (2018). Classical humanitarianism and resilience humanitarianism: Making sense of two brands of humanitarian action. *Journal of International Humanitarian Action, 3*(1), 1–12.

Hilhorst, T., Melis, S., Mena Fluhmann, R., & van Voorst, R. (2021). Accountability in humanitarian action. *Refugee Survey Quarterly, 40*(4), 363–389. https://doi.org/10.1093/rsq/hdab015

Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management, 35*(6), 1404–1427.

Huss, O., & Labonte, M. (2018). Humanitarian aid in Ukraine: Understanding the role of non-governmental organizations in a conflict zone. *Journal of International Humanitarian Action, 3*(1), 1–17.

Khan, M., Lee, H. Y., & Bae, J. H. (2019). The role of transparency in humanitarian logistics. *Sustainability, 11*(7), 2078.

Kurz, C., Corlazzoli, V., Marinković, A., BasgaBagré, B., Zoh, C., Nixha, D., & Abylkasymova, M. (2022). Thematic review on local peacebuilding. https://www.un.org/peacebuilding/sites/www.un.org.peacebuilding/files/documents/local_peacebuilding_thematic_review_final_report.pdf

Mamokhere, J., & Mabila, T. E. (2021). The role of the Council of Non-Governmental Organisations on peacebuilding in the Southern African Development Community: A conceptual perspective. *Journal of African Union Studies, 10*(1), 89.

Masten, A. S., Cutuli, J. J., Herbers, J. E., Hinz, E., Obradović, J., & Wenzel, A. J. (2014). Academic risk and resilience in the context of homelessness. *Child Development Perspectives, 8*(4), 201–206.

Masten, A. S., Reed, M. G. J., Snyder, C. R., & Lopez, S. J. (2002). Handbook of positive psychology.

Mehmetcik, H. (2019). Humanitarian NGOs: Motivations, challenges, and contributions to Turkish foreign policy. *Perceptions: Journal of International Affairs, 24*(2), 249–278.

Miriti, N. S., & Karithi, N. M. (2020). Factors influencing sustainability of non-governmental organizations: A study for Nairobi, Kenya. *FOCUS: Journal of International Business, 7*(1), 145–163. https://doi.org/10.17492/focus.v7i1.195422

Mubecua, M. A., & David, O. J. (2019). So far so good? Tracking the poverty eradication goal of SDGs in Kenya, Nigeria, and South Africa. *Journal of Public Affairs, 19*(4), e1964.

Mwai, K. P., Onkware, K., & Maiyo, A. (2022). Strategies applied by humanitarian organizations as interventions to foster refugee children needs at Kakuma and Kalobeyei Refugee Camps, Kenya. *International Journal of Social Sciences and Humanities Invention, 9*(07), 7065–7079.

Njoroge, B. G. (2013). An investigation on the factors influencing sustainability of NGOs in Kenya. *Doctoral dissertation, University of Nairobi*. http://erepository.uonbi.ac.ke/handle/11295/58486

Pascucci, E. (2021). More logistics, less aid: Humanitarian-business partnerships and sustainability in the refugee camp. *World Development, 142*, 105424.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations*. New York.

Pittaway, E., Bartolomei, L., & Doney, G. (2020). Gender and refugee livelihoods: A case study of Kakuma Refugee Camp. *Journal of Refugee Studies, 33*(2), 279–298.

Purgato, M., Gross, A. L., & Tol, W. A. (2018). Psychosocial interventions for children in humanitarian settings: A meta-analysis. *The Lancet Global Health, 6*(8), e911–e920.

Shah, S., Padhani, Z. A., Als, D., Munyuzangabo, M., Gaffey, M. F., Ahmed, W., & Bhutta, Z. A. (2021). Delivering nutrition operations to women and children in conflict settings: A systematic review. *BMJ Global Health, 6*(4), e004897.

Smit, R., Dijkstra, L., & Jondkman, S. (2020). Community participation in humanitarian aid: Power dynamics and empowerment in Kakuma Refugee Camp, Kenya. *Journal of Refugee Studies, 33*(2), 257–278.

Spiegel, P. B., Checchi, F., Colombo, S., Paik, E., & Patterson, N. (2017). Health-care needs of people affected by conflict: Future trends and changing frameworks. *The Lancet, 389*(10072), 1330–1340.

Licensed Under Creative Commons Attribution (CC BY-NC)

Sturridge, C., Feijó, J., & Tivane, N. (2022). Coping with the risks of conflict, climate, and internal displacement in northern Mozambique. *Humanitarian Policy Group*. https://media.odi.org/documents/USAID_CCD_Mozambique_final.pdf

Van Breda, A. D. (2018). A critical review of resilience theory and its relevance for social work. *Social Work, 54*(1), 1–18.

Wachira, L. W. (2016). Factors affecting financial sustainability of local NGOs in Kenya, Kiambu County. (Doctoral dissertation, KCA University). https://erepo.usiu.ac.ke/bitstream/handle/11732/3980

Zziwa, A. A., Nabiswa, F., & Mayo, A. (2021). Strategies put in place to facilitate refugees' access to humanitarian aid in Kakuma Refugee Camp, Kenya. *Reviewed Journal of Social Science & Humanities, 2*(1), 1–14.

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Effects of capacity building initiatives on performance of health workers in Rubanda District, Uganda

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ABSTRACT

This study specific objective was to examine the effects of capacity building initiatives on performance of health workers in Rubanda District. This study was guided by Social Cognitive Theory (SCT). The study followed a descriptive design. Data from 120 respondents was collected and analyzed quantitatively complemented with qualitative analysis. Self-administered questionnaires were applied.. Since descriptive analysis entailed description of a single variable and its attributes, frequency tables were used to present the data. At the bivariate level, a Pearson correlation matrix was conducted to ascertain the relationships between the predictor variables and the dependent variable. A linear regression model was used to fit the data. Respondents strongly agreed that capacity building initiatives improve health workers' performance. Regression analysis showed a strong, significant positive correlation ($r = 0.762$, $p < 0.05$) between capacity building initiatives and health worker performance, explaining 82.5% of performance variance ($R^2 = 0.825$). The regression coefficient was 0.921 ($p < 0.001$), indicating that increased capacity building significantly improves performance. The main conclusion drawn from this research is that capacity building initiatives affects performance significantly and positively. The study recommends that Rubanda district should continue to invest in structured and relevant capacity building initiatives.

Keywords: Capacity Building Initiatives, Health Workers, Performance, Rubanda District, Uganda

I. INTRODUCTION

Programs for continuing professional development are essential for enhancing health human resource effectiveness, particularly in settings like Rubanda district. The subsequent subsection delves deeper into examining several facets of capacity building programs in relation to health workers' performance. According to DeCorby-Watson *et al*. (2018), capacity building programs are planned procedures that are used and put into action to improve knowledge, skills, self, efficiency, behaviors, and organizational capacity at the individual, organizational, or community levels. In this study, training, peer support programs, and access to technical services will be the basis for evaluating capacity building initiatives. Measuring health-care performance began in the United States of America (USA) before the 1990s (Abate et al., 2022). Performance was assessed using licensing, protocol adherence, and patient outcomes in hospital settings. The 1990s and 2000s saw the introduction of performance-based payment models (pay-for-performance) and clinical audits. The Agency for Healthcare Research and Quality (AHRQ) developed standardized quality indicators.

According to Agbele and Humphrey (2021), new developments in health worker performance measurement have emerged, such as the use of Electronic Health Records (EHRs) to track productivity and quality. While some countries have long-standing traditions of assessing health worker performance, particularly in primary care, the formalization and standardization of these systems, including the use of electronic medical records (EMRs) and specific performance frameworks, has gained traction in recent years, particularly in light of universal health coverage objectives. According to Babatunde and Akintola (2023), the success of Performance-Based Financing (PBF) in countries such as Cambodia and the Philippines can be attributed to the development of health worker capacity through training, peer support, and access to technological equipment. There was an increased emphasis on client feedback, clinical audits, and data digitization.

Babatunde and Akintola (2023) explain that the performance of healthcare workers in Europe has evolved over time, with formal systems emerging in the latter half of the twentieth century (Babughirana, 2016). While some form of monitoring had existed previously, the formalization and widespread adoption of performance measurement frameworks gained traction in the 1980s and 1990s. Even before formal systems, healthcare providers and institutions would keep track of certain work-related metrics (Bandura, 2001). This could include fundamental statistics such as patient volume, length of stay, and basic outcome information. Beginning in the early 1980s, the UK's National Health

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Service (NHS) led the way in the development and dissemination of performance data. This was motivated by a desire to increase accountability and transparency in the healthcare system. The European Commission then took steps to standardize and coordinate performance measurement across member states. The European Core Health Indicators (ECHI) initiative, for example, was launched to collect relevant indicators (Berrick et al., 2020). Performance measurement in healthcare is evolving, with a greater emphasis on patient-reported outcomes, quality of care, and equity. Measuring and improving performance in primary healthcare settings is becoming increasingly important, particularly in terms of universal health coverage and primary health care system strengthening.

Performance management of health workers in Africa is a relatively new development, with formal implementation gaining traction in the late 1990s and early 2000s, particularly as part of health sector reforms and decentralization efforts (Basajja & Nambobi, 2022). Several factors contributed to the gradual adoption of performance measurement for health workers in Africa. Many African countries, including Uganda, implemented decentralization policies in the 1990s, transferring management of health services to local governments. This shift necessitated the development of mechanisms to monitor and evaluate the performance of health workers at the local level.

Bell *et al.* (2022) explains that, broader push for health sector reforms, often linked to achieving the Millennium Development Goals (MDGs) and later the Sustainable Development Goals (SDGs), also drove the need for performance management. These reforms aimed to improve the efficiency and effectiveness of health systems, and performance measurement was seen as a crucial tool for achieving these goals. International organizations such as the World Health Organization (WHO) and the Joint Learning Initiative (JLI) helped to raise awareness about the value of human resources in health and advocate for better performance management systems in Africa. Many African countries faced persistent challenges in providing adequate healthcare services, including a lack of skilled health workers and inefficiencies in service delivery. Performance measurement was viewed as a means of identifying areas for improvement and holding healthcare workers accountable. While the concept of performance management is relatively new, its implementation is not consistent across the continent. According to some studies in Uganda, while performance is used to some extent, there are frequently gaps in its implementation, such as insufficient performance target setting and planning.

Capacity building for health workers is an ongoing effort that has evolved over time in Africa, East Africa, and Uganda. Disease outbreaks, resource limitations, and shifting global health priorities have all had an impact on initiatives. According to Basajja, and Nambobi (2022), globally, capacity building efforts for health workers have been ongoing for decades, dating back to the mid-twentieth century. The World Health Organization (WHO) and other international organizations have played an important role in promoting these efforts, especially since the emergence of HIV/AIDS and other global health issues. The focus has shifted from solely training to a more comprehensive approach that includes leadership, management, and system strengthening.

Berrick *et al.* (2020) reported that capacity building in Africa gained traction in the late twentieth century, particularly with the rise of community health worker programs and initiatives aimed at addressing specific health crises. The East, Central, and Southern Africa Health Community (ECSA-HC) has played an important role in promoting regional cooperation and capacity building within the ECSA region. More recently, the African Union has made strategic commitments to strengthen the health workforce, such as deploying community health workers. Capacity building initiatives have primarily aimed to strengthen health systems and improve healthcare service quality (Bell et al., 2022). The Uganda Capacity Program, for example, aimed to strengthen institutions that plan, develop, and manage the health workforce. Other initiatives have focused on specific areas such as nursing and midwifery, with collaborations from organizations such as the Johnson & Johnson Foundation, Aga Khan University, and the Aga Khan Foundation East Africa.

Capacity building for health workers in Uganda has been ongoing since the 1980s, with various initiatives. The Health Manpower Development Centre (HMDC) in Mbale was founded in 1982 as a national in-service training facility to promote ongoing professional development (Akiba *et al.*, 2019). Other notable efforts include the "Institutional Capacity Building project in Planning, Leadership, and Management" launched in 2009 to address leadership and management gaps in the health sector. Intra Health International also implemented a USAID-funded program to strengthen Ugandan institutions' capacity to manage their health workforce. More recently, the Global Capacity Building (GCB) programme has helped Ugandan health partnerships implement innovative healthcare-improvement projects. It is from this background that has motivated the researcher to examine the effect of capacity building on the performance of health workers in Rubanda District.

1.1 Statement of the Problem

Highly motivated, well, trained and retained health workers are crucial for high quality service delivery and patient satisfaction within Rubanda District, it is therefore vital for the district to be equipped with competent health teams. However, the district is experiencing the following challenges; inadequate number of health workers, poor health worker efficiency, and no ability to retain specialized human resources (Mugisha et al., 2019). Still, health workers have low performs with negative attitude, low motivation and poor service delivery (Mbacha *et al*., 2022; Khanal *et al*., 2020;

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Kwikiriza *et al*., 2020) even with very many Capacity building programs such as SPARS, CODES, CQI programs and assessment of quality sexual reproductive health and HIV, integrated services (Trap *et al*., 2021) If such problems are not checked they may result in continued compromises in service delivery morale and workforce shortages that are likely to affect healthcare quality and health of the population in the area of operation (Zulu *et al*., 2015; Mutale *et al*., 2013). The purpose of this research is therefore to assess the impact of capacity building programmes on health worker performance in Rubanda District. Thereby, the research aims to develop solutions to the challenges and deficiencies identified in the quest to improve the healthcare delivery in the area. The relevance of this solution is underlined by the fact that it offers important suggestions as to how Capacity building programs enhance the performance of HI and overall health systems.

1.2 Research Objective

To examine the effects of capacity building initiatives on performance of health workers in Rubanda District

1.3 Research Question

What are the effects of capacity building initiatives on the performance of health workers in Rubanda District?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by Social Cognitive Theory (SCT) developed by Bandura (2001). The theory states that, human behavior is learned and influenced by the interaction of personal factors, environmental factors, and the behavior itself. It emphasizes that learning occurs not only through direct experience but also through observing others and the consequences of their actions. Key aspects include reciprocal determinism, observational learning, and self-efficacy. Social Cognitive Theory (SCT) assumes that learning occurs through observation and modelling, and that behaviour is influenced by a continuous interplay of personal factors, environmental factors, and the individual's own behaviour. This means that people learn not only through direct experience, but also by observing others and reflecting on their own thoughts and feelings about their actions.

Social cognitive theory's (SCT) strengths include its comprehensive approach to understanding behaviour, emphasis on self-efficacy and reciprocal determinism, and broad applicability across multiple domains. It focuses on the interaction of personal factors, environmental influences, and behaviour in shaping human actions. Social cognitive theory, while comprehensive, has several flaws. It can be overly broad, making it difficult to operationalize and test in one study. The theory's emphasis on the interaction of person, behaviour, and environment can be ambiguous, leaving it unclear which factor is most influential. It may also fail to adequately address emotional and motivational factors, as well as biological and genetic predispositions.

Social Cognitive Theory (SCT) is relevant to the capacity building and performance of health workers in Rubanda District because it provides a framework for understanding how individuals learn, develop skills, and change behaviour, all of which are critical components of capacity building. SCT emphasizes how individual factors (such as self-efficacy and outcome expectations), environmental factors (such as social support and organizational resources), and behavioural factors (such as skills and knowledge) interact to shape performance. Understanding these relationships allows interventions to be designed to increase health workers' capacity and performance.

2.1.1 Conceptual Perspective

Capacity building is "the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time(United Nations Development Programme (UNDP), (2023). Capacity building is the process of developing and strengthening the skills, abilities, processes, and resources that organizations and communities need to survive, adapt, and thrive in a fast-changing world (Organisation for Economic Co-operation and Development (OECD), 2016). Capacity building refers to investment in people, institutions, and practices that will, together, enable countries to achieve their development goals (World Bank, 2023).

Training is "a process that attempts to teach employees the skills they need to perform their jobs. Training is a planned effort by a company to facilitate employees' learning of job-related competencies, including knowledge, skills, or behaviours that are critical for successful job performance (Noe, 2020). Training is the use of systematic and planned instruction activities to promote learning. Peer support programs are "a system of giving and receiving help founded on key principles of respect, shared responsibility, and mutual agreement of what is helpful (Mead et al., 2001). Peer support is "social emotional support, frequently coupled with instrumental support that is mutually offered or provided by persons having a mental health condition to others sharing a similar mental health condition to bring about a desired social or personal change (Trap et al., 2021). Peer support programs involve trained individuals who have lived

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experience with mental health challenges and recovery, offering support to others experiencing similar issues in a structured, recovery-oriented way (Mental Health Commission of Canada, 2016).

Access to technical services refers to the ability of individuals, especially farmers, to obtain expert advice, training, and support on improved technologies, practices, and innovations to enhance productivity and sustainability (Food and Agriculture Organization, 2020). Access to technical services includes the availability and use of specialized knowledge, equipment, and support systems necessary for effective healthcare delivery, particularly in low-resource settings. Access to technical services involves the provision and utilization of expert knowledge, tools, and resources aimed at building the capacity of individuals or institutions to perform specific functions effectively (Rowe, 2020).

Performance is "the achievement of quantified objectives, and the extent to which work is done efficiently and effectively. Performance refers to "the behaviors and actions that are relevant to the organization's goals and can be measured in terms of the level of contribution to those goals (Aguinis, 2019). Performance is defined as the extent to which an intervention or institution achieves its objectives in terms of effectiveness, efficiency, and relevance (Organisation for Economic Co-operation and Development. (2016). Client satisfaction is "the patient's reaction to aspects of the service experience, including technical care, interpersonal relationships, and the physical environment (Donabedian, 2020). Client (or customer) satisfaction is "a person's feeling of pleasure or disappointment resulting from comparing a product's perceived performance (or outcome) in relation to his or her expectations (Hotchkiss et al., 2015).

Client satisfaction is "the summary psychological state resulting when the emotion surrounding disconfirmed expectations is coupled with the consumer's prior feelings about the consumption experience. Health worker satisfaction refers to "the degree to which health workers feel personally fulfilled and professionally rewarded by their job roles, responsibilities, and work environments (Ontario, 2020). Health worker satisfaction is "a multidimensional psychological response to one's job, including affective reactions to job conditions, roles, relationships, and rewards (Mukasa et al., 2019). Job satisfaction (including that of health workers) is "a positive feeling about a job resulting from an evaluation of its characteristics (Mutale et al., 2013).

Targets met by health workers" refers to the extent to which health personnel achieve predefined service delivery objectives such as immunization coverage, antenatal visits, or disease treatment outcomes within a specific timeframe. Meeting targets by health workers means fulfilling specific quantitative and qualitative benchmarks related to service provision, such as number of clients served, adherence to clinical protocols, or time-bound treatment goals (Rowe, 2020) Targets met by health workers are measured as the proportion of key health indicators achieved at individual or facility level, such as outpatient department attendance, supervised deliveries, and health education sessions conducted (Noe, 2020).

The performance of health workers depends on motivators such as incentives, satisfaction, supervision, and organizational health systems environment. Knowledge of these dynamics can help enhance the attainment of heath goals where the major focus is on the continual enhancement of the delivery of health services, particularly in LMICs (Abate et al., 2022). Driven by financial rewards, company careers, as well as resources, motivation is core to performance (Fillol et al., 2019). Nonetheless, there as found out that interpersonal relationship/Supervision quality is also a very important factor which cannot be bought (Ojokuku & Salami, 2011; Alhassan *et al*., 2013; Daneshkohan *et al*., 2014).

Through efficient supervision, encouraging teamwork, self-management, and autonomy really increases production and significantly lessens the impact of a staffing shortfall in an institution (Frimpong *et al*., 2011; Zulu *et al*., 2014). Perceptions of responsibilities, resources, and organizational support all influence quality of work life, which has been identified as a significant factor of motivation and performance (Ojokuku & Salami, 2011; Mutale *et al*., 2013; Hotchkiss *et al*, 2015). Performance is also determined in large part by organizational capabilities, culture, and policies (Mbacha *et al*., 2022).Recalling the literature on motivation and performance, it becomes clear that a favourable culture based on decentralized cooperation is conducive to high performance (Mbacha *et al*., 2022; Bertone & Writter, 2015). To assess outcomes for the purpose of this research, performance will be evaluated based on client satisfaction, health worker satisfaction and on targets.

2.1.2 Contextual Perspective

Rubanda District, carved from Kabale in July 2016, operates several key health centers including Muko and Hamurwa Health Centre IVs, plus Bubare HC III. These serve large rural catchments but are not fully studied in terms of systematic performance assessments. Instead, reports focus on infrastructural and resource gaps that indirectly impact worker performance. According District health officer report of 2024, there are key Infrastructure and Resource Shortcomings Muko and Hamurwa HC IVs receive ~17 dental referrals monthly due to lack of equipment, Critical drugs like amoxicillin, septrin, metronidazole, and gloves were out of stock since June 2018; staff report patient abuse due to lack of supplies , Bubare HC III records ~40 deliveries/month but has only 6 beds (1 delivery bed). Hamurwa HC IV performs ~150 deliveries monthly but has only ~28 beds total, with 2 for labor; Muko HC IV has 17 beds. Inconsistent electricity prevents utilization of blood fridges, affecting transfusions, Both HC IVs lack functional theatres (no anesthetic officers), senior nurses, and maternity capacity; surgeries and blood transfusions are referred elsewhere. Staff

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housing <15%, leading to late arrivals and absenteeism. Rubanda reportedly withholds attendance-linked salaries and disciplinary measures to enforce presence.

Performance tracking in Rubanda is limited to anecdotal reporting, lacking standardized metrics or formal evaluations (Mistry et al. 2021). Available data from the district indicates that, Dental referrals: ~17/month from each HC IV due to lack of equipment. Delivery and bed ratios: Bubare HC III: ~40 deliveries/month with 6 beds (1 delivery bed) Hamurwa HC IV: ~150 deliveries/month with only 28 beds (2 delivery beds) Muko HC IV: 100+ monthly deliveries, including ~6 C-sections weekly, yet only 8 maternity beds. These figures highlight high service demand vs low capacity, but no metrics on clinical quality, patient satisfaction, or staff productivity are documented in formal studies.

2.4 Empirical Review

DeCorby,Watson et al. (2018) conducted a systematic analysis that evaluated several public health Capacity building initiatives, identifying six categories: Web based teaching and learning, face to face and online workshops, consultancy services, through computer self-study, and communities of practices and multiple approach. They enhanced knowledge, skills, and confidence as its positive individual learned gains. Nevertheless, only moderate quality studies were identified and no wider effects of the interventions were investigated; thus, future research should focus on the organizational consequences. Bertone and Writter (2015) systematically set out a meta-authorization of theory application of capacity building in public health where 28 approaches were found. They also stressed that such frameworks are deliberately used within the auspices of programs.

In their analysis of the NSW Framework's use in health promotion, Ontario (2020) noted the five action areas' ongoing relevance as well as the importance of community collaboration and outside experts. Another study emphasized the need for additional clarification of the impact of managerial assistance at the organizational and individual levels. In the context of improving public health programs, DeCorby-Watson et al. (2018) also emphasized the significance of choosing and assessing program mechanisms based on specific outcomes. Khanal et al. (2020) analyzed the problems and solutions for the capacity development in health research in sub-Saharan Africa highlighting an African driven model. They therefore championed the ability of African driven scholarship pointing to the SANTHE research collaborative as an example of a well-run program. Important strategies for future activities include personnel development of local researchers, second, qualitative mentees formation for the junior scientists and third, cooperation. This kind of review means further international investment and African national funding are needed for building research intensive institutions for transforming the future aqueously.

The QUIPU survey conducted by the Rowe (2020) indicated weak distribution of health personnel in Africa; some with over one hundred thousand personnel while others were below five thousand. The regional average health worker density was 2.9 per 1000 populations a requirement that was much below the 13.4 recommended for 70% UHC. Challenges in governance and inept performance evaluations pointed to a lack of education, training and management to fill shortfalls for attaining UHC and SDGs.

Mbacha et al. (2022) discussed capacity development in Africa suggesting high rates of economic growth while pointing out major shortcomings in getting to the full capacity. They proposed four research areas: promoting attitude modification, attaining economic diversification, improving resource mobilization and skills management. This aspect highlighted the plight of other institutions such as the ACBF in the consideration of the capacity development coordination.

A systematic review conducted by DeCorby-Watson *et al.* (2018) showed that knowledge, skills, and system, level capacities are enhanced following facility of Capacity building programs. However, most of these studies centred on the individual level effects without capturing other effects. In the same vein, Mead et al., (2001) reported positive relationships between programs and quantity of child health management. The study by Fillol *et al*. (2019) stressed leadership as well as organizational factors in order to promote HWs' motivation through PbF. Full assessments inclusive of organizational effects are mandatory for efficiency of the programs.

The studies on range and usefulness of many capacity building initiatives including peer support programs and access to technical services indicate that professional development can improve knowledge and effectiveness among health workers. Technical services are also important for the performance of libraries which has been pointed out by Decker et al.(2015) and Mistry et al. (2021). Nevertheless, there is a lack of knowledge regarding the enduring effects of such programs and their adjustment for the specific conditions of various healthcare settings, so future studies should centre on follow-up investigations of the effects and the incorporation of these programs into corresponding healthcare promotion plans.

In Sub-Saharan Africa, some capacity strengthening interventions like the SHARP in Malawi and Tanzania feelers and the CARTA project have been proven that has enhanced the health worker productivity and effectiveness (Akiba et al., 2019; Adedokun et al., 2014). Mugabo et al. (2015) confirmed that non, academic training studies can be efficient, and Kruk, et al. (2016) found that technologies in digital health led to enhancements in service provision. Still,

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there are apparent research limitations focusing on the particular effects on the process of health worker performance as well as the replicability of the programmes in various locations.

Over the years, capacity building interventions have played a resource role in enhancing and responding to public health concerns in Uganda. Asingura et al (2022)'s and Kruk et al (2016)'s articles emphasize the need for developing target programs and such concepts as the absence of sufficient health workers and mental health. Mugisha et al. (2019) and Mukasa et al. (2019) leave a good argument on the importance of integrating multifaceted approaches in the improvement of mental health services and workforce challenges. Furthermore, there is a dearth of detailed evidence on the achievement of such programmes in relation to health worker performance and impact on health systems.

III. METHODOLOGY

3.1 Research Design

The cross-sectional research design was used in this study. The cross-sectional research approach of this study allowed data to be gathered at one particular moment in order to examine capacity building initiatives and their effects on the performance of health professionals in Rubanda District. In order to capture the then-current level of capacity building interventions and their impact on the performance of health workers, this design allowed for the quick and efficient collection of data from a large population of health professionals at a specific point in time. It made it possible to find correlations and differences between or among various groups without having to look back over years, months, or weeks.

3.3 Target Population

According to the District Health Officer's Report of 2024, Rubanda District has 20 health centre twos (HC11),6 health centre threes (HC111), and 2 health centre fours (HC1V). This totals to 28 health facilities. For this study, the focus was on health workers directly involved in clinical care, diagnostics, public health, and data management, such as nurses, midwives, medical officers, clinical officers, laboratory staff, health assistants, and health information assistants, because they were the primary beneficiaries of capacity building initiatives like training, mentorship, and technical support. Support staff such as security guards, porters, drivers, and typists, while essential to facility operations, were typically not the target of such programs and therefore fell outside the scope of this study. This made a total of 31 staff members from each of the Health Centre Fours and 62 from the two Health Centre Fours. Therefore, the total population of the study was 274 health staff members, including 62 from HCIV, 72 from HCIII, and 140 from HCII, respectively

3.4 Sample Size and Sampling Technique

The researcher used Morgan formular to determine the sample population as follows. The sample size for this study will be determined by the Krejcie and Morgan formula as shown below

$$n = \frac{x^2 NP(1-P)}{d^2(N-1) + X^2 P(1-P)}$$

Where n = required sample size

N = population size (205)

X^2 = the table value of Chi-square for 1 degree of freedom at the desired confidence level (typically 3.841 for a 95% confidence level

P = the population proportion (assumed to be 0.5 since this provides the maximum sample size)

d = the degree of accuracy expressed as a proportion (typically 0.05 for a 5% margin of error)

Substituting in the values us the following

$$n = \frac{3.841 * 274 * 0.5(1-0.5)}{0.05^2(274-1) + 3.841 * 0.5(1-0.5)}$$

$$n = \frac{263.1085}{0.6825 + 0.96025}$$

$$n = \frac{196.85125}{1.64275}$$

$$n = 120$$

Therefore, this study considered a sample population of 120 participants.

3.5 Data Collection Instrument

Self-administered questionnaires were applied. In this case, the respondents independently completed these surveys in the absence of an interviewer. In this research, self-administered questionnaires were utilized in an attempt to obtain information from a large sample size of people while minimizing the impacts of interviewer bias.

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In this research, an interview guide was employed for the following reasons: the use of the interview guide ensured that all relevant topics were captured during the interview. It provided consistency in the interviews and increased the chances of obtaining consistent data. The researcher effectively responded to concrete research questions, asked participants questions, and yielded detailed qualitative data by employing the interview guide.

3.6 Data Analysis

Quantitative data analysis was carried out using both descriptive and inferential statistics. Data was analyzed by computing frequencies which included the means and percentages so as to get the perception of respondents on the effect of capacity building on performance of health workers in Rubanda District. The researcher organised all the collected qualitative data from the interviews with key informants and document analysis and thereafter, it was coded and analyzed and key themes were generated to build understanding of the phenomenon under study

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study achieved 100% response rate. The purpose of the study was to examine the effects of Capacity building programs on performance of health workers in Rubanda District. This chapter presents the findings in accordance with the study's objectives, namely; to examine the effects of capacity building initiatives on performance of health workers in Rubanda District, to assess the effects of Peer Support programs on performance of health workers in Rubanda District and to examine the effects of access to technical services on performance of health workers in Rubanda District. This section presents descriptive statistics, correlations, and regression based on questionnaire responses and qualitative insights from the conducted interviews as thematically examined.

4.2 Descriptive Statistics

4.2.1 Capacity Building Initiatives on Performance of Health Workers in Rubanda District

Examining the effect of to assess the effects of Peer Support programs on performance of health workers in Rubanda District was the first goal. The primary and secondary sources provided the data needed to accomplish this. This was done using a five-scale questionnaire of strongly Agree (SA), Agree (A), Undecided (UD), Disagree (D) and Strongly Disagree (SD). A summary of the responses is presented in the table below**.** Key: Strongly Agree (SA)+ (Agree (A) all agreed. Undecided (UD) were neutral, Disagree (D) + Strongly Disagree (SD) all disagreed.

Table 1

Analysis on the Five Statements that were Subjected to the Respondents

Response	Agree		Undecided		Disagree	
	F	%	F	%	F	%
I have attended formal training sessions relevant to my job as a health worker in the past year.	100	83.3	20	16.7	00	00
Peer mentoring has contributed to my professional development	98	81.7	22	18.3	00	00
Performance has increased at my work place because of peer support programs	99	82.5%	21	17.5	00	00
The infrastructure and equipment available at my workplace are sufficient to perform my duties effectively	101	84.2	00	00	19	15.8
There is high performance because of technical access	98	81.7	22	18.3	00	00

Table 1 above analyses the five statements given to respondents to assess the effect of capacity building initiatives on the performance of health workers in Rubanda District. When asked if they had attended formal training sessions relevant to their job as a health worker in the previous year, 83.3% did, while 16.7% were unsure. The data indicates a strong uptake of formal capacity building initiatives among health workers in Rubanda District, which is a positive sign for capacity-building efforts. Furthermore, Peer mentoring has contributed to my professional development as noted by 81.7% who agreed. When respondents were asked that performance has increased at my work place because of peer support programs, 82.5% agreed, while 17.5% disagreed. On infrastructure and equipment available at the workplace are sufficient to perform my duties effectively in relation to 84.2% who agreed while 81.7% agreed that there was high performance because of technical access

> *"Without capacity building initiatives, we would not have performed as well as we do in the Rubanda district local government. This is why Rubanda District is performing well compared to other districts in Uganda.".*

Capacity building initiatives is viewed as a critical factor behind the improved performance and service delivery of health workers in Rubanda District. These outcomes are supported by Mugisha et al. (2019) who noted that a district's

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relative success in health care performance is believed to be the result of continuous investment in training, peer support program and technical services which has enhanced knowledge, skills, and service quality among health personnel. The study confirmed that there was a relationship between quantitative and qualitative findings after doing a qualitative data analysis. The two data sets agreed, and it was obvious that qualitative data supported quantitative data.

4.1.2 Performance of Health workers

This section summarizes the research on the performance of health workers in Rubanda District as the dependent variable, utilizing questions designed to elicit data from respondents. The information required for this task was gathered using both primary and secondary sources. The table below shows a summary of the responses.

Table 2

Performance of Health Workers in Rubanda District

Statements on performance	**Agree**		**Undecided**		**Disagree**	
	F	%	F	%	F	%
I provide high-quality care to my clients, which enhances their satisfaction.	120	100	00	00	00	00
Capacity building programs have helped me achieve my health performance targets.	120	100	00	00	00	00
Team work increase performance	120	100	00	00	00	00

When asked whether they provide high-quality care to clients that enhances client satisfaction, 100% of the respondents agreed, indicating a strong commitment to quality service delivery. Similarly, when asked whether capacity building programs have helped them achieve their health performance targets, all respondents (100%) agreed, suggesting that training and development initiatives are effectively supporting performance improvement. Lastly, respondents were asked whether teamwork increases performance, and again, 100% of the respondents agreed, highlighting the value placed on collaboration and collective effort in achieving better health outcomes. The unanimous agreement across all three statements aligns with Noe's (2020) study which reflects a high level of confidence and positive perception among health workers regarding the quality of care they provide, the effectiveness of capacity building programs, and the role of teamwork in enhancing performance.

4.2 Hypothesis Testing

In order to be able to generalize the results from the population samples, this study tested the potential hypotheses. Statistical inference was used to accomplish this. In order to create a relationship model, test the hypotheses, and determine whether there was a relationship at all between the independent and dependent variables, correlation and regression analyses were carried out. As a result, the degree of the association was ascertained by using the Pearson's product moment correlation coefficient.

Table 3

Correlation analysis for Capacity Building Initiatives on Performance

		Performance	**Capacity Building initiative**
Performance	Pearson Correlation	1	.762**
	Sig. (2-tailed)	.000	.000
	N	120	
Capacity building initiatives	Pearson Correlation	.762**	1
	Sig. (2-tailed)	.000	0.000
	N	120	120

**. Correlation is significant at the 0.05 level (2-tailed).

This result demonstrates a strong positive and significant correlation for capacity building initiatives and performance (0.762: p less than 0.05). This results corroborates with Kruk's (2016) who analyzed the problems and solutions for the capacity development in health and deviates from Fillol *et al.* (2019) who assessed the impact of capacity building initiatives on development of health workforce in three African states, they observed that majority of the trainees stayed with the identified institutions enhancing management as well as policy. However, some left because of discontent in some of the conditions which were offered to them with an intention to work in different areas.

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Table 4

Showing the model summary of Capacity building Initiatives

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762[a]	.825	.824	.15216

a. Predictors: (Constant), Capacity building initiatives

The coefficient of determination (.825) indicates that the capacity building initiatives has an impact on performance. As a result, a substantial positive significance exists. This suggests that the more capacity building initiatives health workers receive, the better their performance. Thus, in terms of performance, capacity building initiatives account for 82.5% of the Rubanda District. The findings demonstrate that capacity building initiatives are a key driver of health worker performance in Rubanda District. With 82.5% of performance changes linked to capacity building initiatives, the district can confidently attribute improvements in service delivery, skills, and efficiency to these capacity-building efforts. This strong correlation underscores the importance of continuous and targeted capacity building initiatives to enhance health sector performance. Asingura *et al* (2022)'s and Kruk *et al* (2016)'s found that capacity building initiatives has a positive significant effect on performance of health workers sufficient health workers and mental health. Mugisha *et al*. (2019) and Mukasa *et al* (2019) leave a good argument on the importance of integrating multifaceted approaches in the improvement of mental health services and workforce challenges.

Table 5

Regression output summary on, Capacity building initiatives Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.385	.134		2.882	.005
Capacity building initiatives	.921	.030	.762	30.953	.000

Dependent Variable: Performance

The outcome again showed a regression coefficient of .762 at a 0.01 level of significance, indicating a significant difference in favor. With a Beta value of 0.762 at a 99% level of confidence, the results further demonstrate that capacity building initiatives have an effect on performance of health workers in Rubanda District. This findings agrees with Bell et al. (2022) who found that capacity development affects performance of health workers. This deviates from Aguini's (2019) who assessed the impact of capacity building initiatives on development of health workforce in three African states of which the variables were of insignificant effect.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

According to the research and analysis shown above, performance of health workers in Rubanda District is impacted by training initiatives, peer support programs and access to technical services. Based on the research findings and analysis presented, it is clear that capacity building initiatives significantly improve the performance of health workers in Rubanda District. The majority of respondents agreed that formal training, improved their ability to provide quality health care, meet performance goals, and collaborate more effectively as a team. The high levels of agreement ranging from 81.7% to 100% across various performance-related indicators strongly suggest that ongoing capacity building is critical for improving knowledge, skills, and service delivery outcomes among health workers. As a result, investing in structured and relevant capacity building programs is critical for maintaining and improving health care performance in the district.

5.2 Recommendations

Based on the findings that capacity building initiatives have a significant effect on the performance of health workers in Rubanda District, the following recommendations are proposed: The District Health Department should institutionalize regular and structured training programs to ensure that health workers continuously upgrade their skills and stay updated with current healthcare practices and policies. Capacity building initiatives should be aligned with the specific duties and capacity gaps of different cadres of health workers to maximize relevance and impact on performance. A robust monitoring and evaluation (M&E) framework should be established to assess the effectiveness of training programs in improving individual and institutional performance. In addition to formal training, the district should encourage peer mentoring, coaching, and supportive supervision as cost-effective ways to reinforce learning and performance at the workplace.

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REFERENCES

Abate, F., Adam, V., & Nwaogwugwu, J. (2022). Availability of personnel, facilities, and services in primary health care centres in a local government area in Benin City, Nigeria. *Annals of Clinical and Biomedical Research, 1*(1), 23–28. https://doi.org/10.4081/acbr.2020.111

Adedokun, B., Nyasulu, P., Maseko, F., Adedini, S., Akinyemi, J., Afolabi, S., & Otwombe, K. (2014). Sharing perspectives and experiences of doctoral fellows in the first cohort of the consortium for advanced research training in Africa. *Global Health Action, 7*(1), 2011–2014. https://doi.org/10.3402/gha.v7.25127

Agbele, G., & Humphrey, O. O. (2021). An examination of application of Vroom's expectancy theory in the South-South Nigeria civil service. *British Journal of Management and Marketing Studies, 4*(2), 1–8.

Aguinis, J. (2019). Factors impacting sustainability of community health worker programming in rural Uganda: A qualitative study. *African Health Sciences, 22*(2), 668–677. https://doi.org/10.4314/ahs.v22i2.76

Akiba, C., Go, V., Mwapasa, V., Hosseinipour, M., Amberbir, A., Udedi, M., & Pence, B. (2019). The Sub-Saharan Africa Regional Partnership (SHARP) for mental health capacity building: A program protocol for building implementation science and mental health research and policymaking capacity in Malawi and Tanzania. *International Journal of Mental Health Systems, 13*(1), 45–46. https://doi.org/10.1186/s13033-019-0327-2

Alhassan, G., Garbayo, Á., Raven, J., Theobald, S., Ssengooba, F., Nattimba, M., & Martineau, T. (2013). Decision space for health workforce management in decentralized settings: A case study in Uganda. *Health Policy and Planning, 32*(suppl_3), iii59–iii66. https://doi.org/10.1093/heapol/czx116

Asingura, B., Kiweewa, F., Kaawa, Mafigiri, D., Achabo, S., McCoy, M., Mimbe, D., & Wabwire-Mangen, F. (2019). Training needs for emerging infectious diseases research, surveillance, and control in resource-constrained settings: Findings and recommendations for Uganda. https://doi.org/10.21203/rs.3.rs-2096079/v1

Babatunde, G., & Akintola, O. (2023). Beyond access: Can a school health initiative facilitate healthcare services utilization for school-going children? *International Journal of Environmental Research and Public Health, 20*(15), 6448. https://doi.org/10.3390/ijerph20156448

Babughirana, G. (2016). Village health team functionality in Uganda: Implications for community system effectiveness. *Science Journal of Public Health, 4*(2), 117. https://doi.org/10.11648/j.sjph.20160402.16

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*(1), 1–26.

Basajja, M., & Nambobi, M. (2022). Information streams in health facilities: The case of Uganda. *Data Intelligence, 4*(4), 882–898. https://doi.org/10.1162/dint_a_00177

Bell, L., Nolan, D., Immonen, V., Helms, E., Dallamore, J., Wolf, M., & Korakakis, P. (2022). "You can't shoot another bullet until you've reloaded the gun": Coaches' perceptions, practices, and experiences of deloading in strength and physique sports. *Frontiers in Sports and Active Living, 4*. https://doi.org/10.3389/fspor.2022.1073223

Berrick, J., Young, E., Cohen, E., & Anthony, E. (2020). 'I am the face of success': Peer mentors in child welfare. *Child & Family Social Work, 16*(2), 179–191. https://doi.org/10.1111/j.1365-2206.2010.00730.x

Berrick, S., Subedi, H., Paudel, P., Chand, P., Shrestha, M., McCullough, A., & Elsey, H. (2010). Implementation research to assess a health workers' performance-based management system in Nepal. *Acta Paediatrica, 107*(S471), 24–34. https://doi.org/10.1111/apa.14406

Bertone, J., & Writter, J. (2015). Consensus statement on bladder training and bowel training. *Neurourology and Urodynamics, 39*(5), 1234–1254. https://doi.org/10.1002/nau.24345

Bulage, D., Gagne, J., & Kesselheim, J. (2016). Defining service and education in pediatrics. *Clinical Pediatrics, 56*(13), 1193–1200. https://doi.org/10.1177/0009922816684604

Daneshkohan, N., Yahya, K. K., Yean, T. F., Maasir, L., & Abdullah, T. M. K. (2014). Determining factors of career commitment moderated by self-efficacy among generation in the banking sector using social cognitive theory (SCT). *Asia Pacific Management and Business Application, 10*(3), 361–376.

Decker, J., Miller, S., & Khurtz, S. (2015). Implementation of an effective decentralized program for detection, treatment, and prevention of tuberculosis in children. *Tropical Medicine and Infectious Disease, 6*(3), 131. https://doi.org/10.3390/tropicalmed6030131

DeCorby-Watson, K., Mensah, G., Bergeron, K., Abdi, S., Rempel, B., & Manson, H. (2018). Effectiveness of capacity building programs relevant to public health practice: A systematic review. *BMC Public Health, 18*(1), 34. https://doi.org/10.1186/s12889-018-5591-6

Donabedian, T. (2020). Enriching patient-centered medical homes through peer support. *The Annals of Family Medicine, 13*(Suppl_1), S73–S78. https://doi.org/10.1370/afm.1761

FAO. (2020). Indian shopper motivation to use artificial intelligence. *International Journal of Retail & Distribution Management, 47*(3), 331–347. https://doi.org/10.1108/ijrdm-11-2018-0251

Fillol, A., Lohmann, J., Turcotte, T., Tremblay, A., Somé, P., & Ridde, V. (2019). The importance of leadership and organizational capacity in shaping health workers' motivational reactions to performance-based financing: A

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multiple case study in Burkina Faso. *International Journal of Health Policy and Management, 8*(5), 272–279. https://doi.org/10.15171/ijhpm.2018.133

Frimpong, T., Abebe, S., Yitayal, M., Persson, L., & Berhanu, D. (2011). Association between a complex community intervention and quality of health extension workers' performance to correctly classify common childhood illnesses in four regions of Ethiopia. *PLOS ONE, 16*(3), e0247474. https://doi.org/10.1371/journal.pone.0247474

Hotchkiss, Fisher, E., Boothroyd, R., Coufal, M., Baumann, T., & Tanasugarn, C. (2015). Peer support for self-management of diabetes improved outcomes in international settings. *Health Affairs, 31*(1), 130–139. https://doi.org/10.1377/hlthaff.2011.0914

Khanal, P., Choulagai, B., Acharya, P., & Onta, S. (2020). Work motivation and job satisfaction among health workers at primary health facilities: A cross-sectional study from Nepal. *BMC Health Services Research, 20*(8), 34. https://doi.org/10.21203/rs.3.rs-30776/v1

Kruk, M., Vail, D., Austin, E., Evelyn, K., Atuyambe, L., Greeson, D., & Grépin, K. (2016). Evaluation of a maternal health program in Uganda and Zambia finds mixed results on quality of care and satisfaction. *Health Affairs, 35*(3), 510–519. https://doi.org/10.1377/hlthaff.2015.0902

Kwikiriza, N., Bajunirwe, F., & Bagenda, F. (2020). Geographic location of health facilities and immunization program performance in Hoima district, western Uganda. *PLoS ONE, 12*(7), e024479. https://doi.org/10.21203/rs.3.rs-25102/v1

Mbacha, C., Lochoro, P., Pizzol, D., Putoto, G., Mazzucco, W., Saracino, A., & Ictho, J. (2022). Capacity assessment for quality sexual reproductive health and HIV services in Karamoja, Uganda. *African Health Sciences, 20*(3), 1053–1065. https://doi.org/10.4314/ahs.v20i3.8

Mead, M., Hilton, E., & Curtiswe, K. (2001). Impact of accreditation on healthcare services performance in Kiryandongo district, Uganda: A longitudinal study. *BMC Health Services Research, 22*(1). https://doi.org/10.1186/s12913-022-07603-4

Mental Health Community of Canada. (2016). Empowering peer group leaders for HIV prevention in Malawi. *Journal of Nursing Scholarship, 45*(3), 288–297. https://doi.org/10.1111/jnu.12031

Mistry, S., Harris, E., & Harris, M. (2021). Community health workers as healthcare navigators in primary care chronic disease management: A systematic review. *Journal of General Internal Medicine, 36*(9), 2755–2771. https://doi.org/10.1007/s11606-021-06667-y

Mugabo, J., Hanlon, C., Knizek, B., Ssebunnya, J., Vancampfort, D., Kinyanda, E., & Kigozi, F. (2015). The experience of mental health service users in health system strengthening: Lessons from Uganda. *International Journal of Mental Health Systems, 13*(1), 34–37. https://doi.org/10.1186/s13033-019-0316-5

Mugisha, J., Hanlon, C., Knizek, B., Ssebunnya, J., Vancampfort, D., Kinyanda, E., & Kigozi, F. (2019). The experience of mental health service users in health system strengthening: Lessons from Uganda. *International Journal of Mental Health Systems, 13*, 60 (2019). https://doi.org/10.1186/s13033-019-0316-5

Mukasa, M., Bahar, O., Ssewamala, F., KirkBride, G., Kivumbi, A., Namuwonge, F., & Damulira, C. (2019). Examining organizational factors affecting health worker attendance: Findings from southwestern Uganda. *The International Journal of Health Planning and Management, 34*(2), 644–656. https://doi.org/10.1002/hpm.2724

Mutale, A., Magge, H., Hedt-Gauthier, B., Michaelis, A., Cyamatare, F., Nyirazinyoye, L., & Ntaganira, J. (2013). Clinical mentorship to improve pediatric quality of care at rural health centers in Rwanda: Perceptions and acceptability. *BMC Health Services Research, 13*(1), 275. https://doi.org/10.1186/1472-6963-13-275

Mutale, W., Ayles, H., Bond, V., Mwanamwenge, M., & Balabanova, D. (2013). Measuring health workers' motivation in rural health facilities: Baseline results from three districts in Zambia. *Human Resources for Health, 11*(1), 56. https://doi.org/10.1186/1478-4491-11-56

Noe, W. (2020). Healthcare workers' experiences regarding scaling-up training on integrated disease surveillance and response (IDSR) in Uganda, 2016: A cross-sectional qualitative study. *BMC Health Services Research, 19*(1), 23. https://doi.org/10.1186/s12913-019-3923-6

OECD. (2016). Optimizing the roles of health workers to improve access to health services in Africa: An implementation framework for task shifting and sharing for policy and practice. *BMC Health Services Research, 23*(1), 45. https://doi.org/10.1186/s12913-023-09848-z

Ojokuku, M., & Salami, P. (2011). Implementing infection prevention and control capacity-building strategies during the Ebola outbreak in Liberia. *Pan African Medical Journal, 31*(6), 34–37. https://doi.org/10.11604/pamj.2018.31.107.15517

Ontario, F. (2020). Culturally appropriate peer-led behavior support program for African Americans with type 2 diabetes. *Frontiers in Public Health, 6*(8), 12–17. https://doi.org/10.3389/fpubh.2018.00340

Rowe, A. (2020). Predictors and consequences of rural clients' satisfaction with public and private health systems in Bangladesh. *Global Health Research and Policy, 2*(1), 23. https://doi.org/10.1186/s41256-017-0052-9

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Trap, B., Ladwar, D., Oteba, M., Embrey, M., Mohammed, K., & Wagner, A. (2021). Supervision, performance assessment, and recognition strategy (SPARS): A multipronged intervention for strengthening medicines management in Uganda. *Journal of Pharmaceutical Policy and Practice*, *9*(1), 23–29. https://doi.org/10.1186/s40545-016-0070-x

UNDP. (2023). Psychosocial peer support to address mental health and burnout of health care workers affected by COVID-19: A qualitative evaluation. *International Journal of Environmental Research and Public Health*, *20*(5), 4536. https://doi.org/10.3390/ijerph20054536

World Bank. (2023). Barriers to improvement of mental health services in low- and middle-income countries. *The Lancet*, *370*, 1164–1174.

Yoes, A., & Silvanman, J. (2021). Capacity building in the health sector to improve care for child nutrition and development. *Annals of the New York Academy of Sciences*, *1308*(1), 172–182. https://doi.org/10.1111/nyas.12322

Zulu, J., Hurtig, A., Kinsman, J., & Michelo, C. (2015). Innovation in health service delivery: Integrating community health assistants into the health system at district level in Zambia. *BMC Health Services Research*, *15*(1), 34. https://doi.org/10.1186/s12913-015-0696-4

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Influence of instructional supervision on students' performance in Twelve Years Basic Education (12YBE) in Rwandan rural schools

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ABSTRACT

This study aims to examine the effects of instructional supervision on student performance, focusing on rural schools in Rwanda. The study was guided by two theories: systems theory and the theory of educational supervision. This study was conducted using a descriptive survey design with a mixed approach, integrating both quantitative and qualitative data. The target population consisted of teachers and head teachers of secondary schools in the rural area of Rubavu District. A simple random sampling method was used to select 164 teachers, while purposive sampling was used to select 17 head teachers from 17 schools. Data collection involved questionnaires and interviews, while document analysis was conducted on students' performance as secondary data. Quantitative data was analyzed using descriptive and inferential statistics in SPSS, and qualitative data was analyzed thematically. The findings revealed that inadequate instructional supervision—characterized by infrequent and irregular classroom visits, inconsistent feedback, and a lack of professional development opportunities—was the root cause of poor student performance in rural schools. Correlation and regression analyses showed a strong positive relationship ($R = 0.705$), with instructional supervision accounting for 49.7% of the variance in student outcomes. The ANOVA results ($F = 7.907$, $p = 0.023$) confirmed the model's statistical significance. Regression coefficients indicated that a one-unit increase in instructional supervision improves student performance by 0.565 units, with this relationship being highly significant ($p = 0.023$). These findings suggest that strengthening instructional supervision can significantly enhance student achievement, highlighting its critical role in educational quality and policy development for rural school improvement. The study recommended that NESA and policymakers adopt virtual instructional supervision to ensure adequate supervision and to develop a comprehensive instructional supervision policy. It also advised school leaders to plan professional development for teachers and implement regular instructional supervision through classroom visits and constructive feedback. Adopting these strategies could improve students' academic performance in rural schools.

Keywords: Instructional Supervision, Rural Schools, Students' Performance, Twelve Years of Basic Education

I. INTRODUCTION

Education is a fundamental pillar of societal development, and improving the quality of education remains a priority for educational stakeholders. likewise, the quality of education often hinges on the effectiveness of instructional supervision, a process that involves monitoring, evaluating, and supporting teachers to ensure they deliver curriculum content effectively and foster students' learning outcomes. In rural schools, where resources are often scarce and the teachers face numerous challenges, effective instructional supervision can play a vital part in ensuring quality education by guiding teachers toward improved instructional practices. However, inadequate instructional supervision in schools remains a pervasive challenge worldwide, particularly in rural areas where resource limitations, logistical challenges, and systemic inefficiencies are prevalent. In rural Ghana, for example, more supervisory visits were made to the urban junior high schools by the external supervisors than to the rural ones (Appiah, 2009). Similarly, in Latin American rural areas, supervisors are often unable to visit schools frequently due to transportation challenges and budget constraints (Vasconcellos, 1997).

In regions such as South Asia, research has shown that inadequate supervision leads to poorer teaching quality, as teachers in rural schools are often left without sufficient oversight or feedback (Hossain, 2018). The study of Buch et al (2022) in Sub-Saharan Africa found that the head teachers concentrated more on other administrative activities than instructional activities, which could limit students' achievement.

In the Rwandan context, the research of Nirere et al (2023) found that instructional supervision was rarely done by school leaders. On the other hand, the research conducted by Nsengimana (2024) identified the significant challenges

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faced by head teachers to conduct regular instructional supervision, including inadequate training, reported by 83.1% of respondents, insufficient time for supervision due to heavy workloads (79.1%), and limited resources and support from educational authorities. While the relationship between instructional supervision and student academic performance has been widely studied, with research consistently revealing a strong correlation between the two (Makau et al., 2016), (Comighud et al., 2020), (Ndayambaje, 2024) and (Hanshi, 2023). However, the key research gap remains in the lack of empirical studies focusing on the current state of supervisory practices in response to the poor performance of students in rural schools of Rwanda. But what is commonly known is poor students' academic performance in Nine- and Twelve-Years Basic Education schools, especially in rural areas. For instance, the study of Nizeyimana et al. (2020) found that there is no quality education in these schools due to difficulties in school management. In this regard, this research aimed to explore the current state of supervisory practices and their influences on the academic performance of students for Nine- and Twelve-Years Basic Education in rural schools of Rubavu District, Rwanda. This study is therefore useful for understanding the need for regular instructional supervision and its importance for improving student performance and success in schools struggling with numerous challenges and overall quality of education as well.

1.1 Statement of the Problem

According to ESSP 2018-2024, Rwanda's hope relies on the education sector to elevate the country to upper-middle-income status by 2035. Despite efforts by the government of Rwanda to improve the quality and importance of education, the Nine and Twelve-Years Basic Education in rural schools continues to show lower student performance compared to urban schools. Inadequate instructional supervision and limited teacher support may contribute to this gap. The National Examinations and Schools Authority (NESA), DEOs, SEIs, and head teachers are responsible for ensuring that all schools in Rwanda meet academic standards, follow the prescribed curriculum, and maintain an effective learning environment. However, challenges such as heavy workload for head teachers, personnel shortages in educational supervision authorities, geographic isolation, and poor transportation infrastructure make it difficult for supervisors to perform regular, consistent supervision and provide timely support to rural schools (Nsengimana, 2024).

This lack of consistent supervision results in poorer student performance in rural Rwanda. A clear indicator of the urban-rural divide is the difference in performance on national exams. As noted in the report, urban schools consistently outperform rural ones in the Primary Leaving Examinations (PLE) and Secondary School Examinations (S6). In the 2022 PLE, urban schools had an 84% pass rate, compared to 71% in rural schools. Similar patterns are seen in Senior 6 exams, where urban students achieved pass rates of 78% in subjects like math and science, compared to 65% in rural regions (NESA, 2023). These results underscore the ongoing achievement gap. Urban students also perform better in English proficiency than rural students.

Consequently, the lack of adequate instructional supervision impacts teachers, school administration, and students. Teachers often lack guidance and support, hindering their professional growth and instructional effectiveness, which affects students' academic success and prospects. Additionally, inconsistent supervision hampers the implementation of new teaching methods, curriculum updates, and extracurricular activities that support a well-rounded education. This can lead to disconnection between school administration, teachers, and the local community, making it harder to address rural students' specific needs. The seriousness of this issue requires urgent attention and strategic interventions.

1.2 Research Objectives

i. To investigate whether the classroom visitation by supervisors is carried out in rural schools
ii. To examine the impact of feedback provided during instructional supervision on teaching practices and professional development of teachers in rural schools.
iii. To investigate the provided professional development opportunities to teachers in rural schools.
iv. To assess the relationship between instructional supervision on the performance of the students in rural schools

1.3 Research Questions

i. To what extent is classroom visitation carried out in rural schools?
ii. What are the impacts of feedback provided by supervisors on teachers' performance in rural schools?
iii. What are the professional development opportunities provided to teachers in rural schools?
iv. What is the relationship between instructional supervision and students' academic performance in rural schools?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by two theories that provide insight into the relationship between supervision, resource allocation, and educational outcomes. Some of such frameworks are the Systems Theory and the Theory of Educational Supervision.

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2.1.1 Systems Theory

This theory emphasizes the relationships, interactions, and interdependencies within a system and between the system and its components. In the field of education, systems theory emphasizes the interconnectedness of all components within the educational system, recognizing that changes or actions in one area can impact others. It provides a holistic framework for understanding and improving how education functions as a dynamic and complex system. It implies that schools function as systems where each component: teachers, resources, policies, and administrative support play a role in achieving educational goals. When one element, such as supervision, is inadequate, it can disrupt the entire system, negatively affecting outcomes like student performance. By viewing education as a dynamic system, stakeholders and policymakers can better understand and navigate its complexities to foster meaningful change by recognizing the interdependence of components, leveraging feedback loops, and ensuring that improvements are both effective and enduring (Khuzwayo, 2020).

2.1.2 Theory of Educational Supervision

Another relevant theory is the Theory of Educational Supervision by Sergiovanni and Starratt (1993). The Theory of Educational Supervision provides a conceptual framework for guiding and improving teaching and learning practices through structured oversight, support, and development of educators and educational systems. It emphasizes the role of supervision as a means to enhance instructional effectiveness, professional growth, and overall school improvement. It emphasizes that effective supervision requires a supportive, collaborative approach where supervisors serve as guides to teachers. This theory emphasizes the significance of consistent oversight and feedback to empower teachers and improve educational outcomes. Applying this theory to the context of the supervisor's role in rural schools highlights the necessity for a supportive supervisory approach to foster academic improvement in these areas.

2.2 Empirical Review

2.2.1 Classroom Visitation and Students' Outcomes

Classroom visits are a core element of instructional supervision. However (Anyango, 2019) argue that the extent to which they are meaningful and impactful depends on Frequency. In other words, the regular and structured visits are more effective than occasional, evaluative ones. Moreover, the purpose of instructional supervision should be to identify strengths and areas for improvement, rather than just serve as an administrative requirement (Andrews, 1991). The research indicates that frequent and structured classroom visits positively impact teacher performance by providing targeted support and ensuring adherence to instructional standards (Yosief et al. 2022). Similarly, another study found that teachers who receive frequent classroom visits coupled with constructive feedback show improvements in their instructional strategies and student engagement levels (Wilczenski, 1987) . Despite its benefits, the effectiveness of classroom visitation largely depends on how it is perceived by teachers. When conducted in a supportive and developmental manner, it fosters a culture of continuous improvement. However, when seen as evaluative or punitive, it may lead to teacher resistance and anxiety, ultimately reducing its impact (Zepeda, 2013). Thus, ensuring that classroom visits focus on professional growth rather than mere performance assessment is crucial to students' success.

Class visitation is one of the school leaders' practices that can contribute to the students' academic performance. The study conducted by Ndagijimana and Uwimbabazi (2025) revealed that numerous techniques employed by school leaders to improve their students' academic performance formed a clear vision of academic achievement, as reported by 61.11% of teachers and 51.17% of students who participated in the study. Furthermore, school leaders may employ additional strategies to improve their students' academic achievement, such as creating a welcoming environment, encouraging leadership in others, and improving education. The findings demonstrate the impact of school leaders' practices on students' academic performance, as reported by respondent students (96.55%) and instructors (100%).

2.2.2 Provision of Feedback and Teacher Performance

Feedback serves as an essential tool for improving instructional practices and enhancing teacher effectiveness. Empirical studies suggest that timely, specific, and actionable feedback significantly influences teacher motivation, instructional quality, and student learning outcomes. According to Hattie (2008), effective feedback contributes to a 0.79 effect size in student learning gains, highlighting its importance in educational improvement. Similarly, Hattie (2007) emphasizes that feedback should be formative rather than summative, guiding teachers toward best practices rather than solely evaluating their performance, further supporting the idea that feedback should be constructive, emphasizing growth and improvement rather than criticism. Thus, Effective feedback mechanisms have been found to enhance teacher self-efficacy and instructional effectiveness.

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2.2.3 Professional Development and Teacher Performance

The study conducted recently on Effects of head teachers' professional development programs on effective school leadership**,** revealed that head teachers in Rubavu District have access to several professional development programs, including the Diploma in Effective School Leadership (DEL) by Rwanda Basic Education Board (REB) and Flemish Association for Development Cooperation and Technical Assistance (VVOB), Head Teacher Capacity Building Workshops, Peer Learning Communities (PLCs), and School Leadership Forums and Conferences. Statistical analysis showed a strong positive relationship between participation in professional development programs and effective school leadership practices ($R = 0.992$, $R^2 = 0.983$, $p < 0.01$). Among these, Peer Learning Communities (PLCs) were found to have the most significant influence, followed by School Leadership Forums and Capacity Building Workshops (Nzarugarura & Ndagijimana, 2025). This emphasized the effective school leadership, including the ability of school leaders to supervise the teaching and learning, to target the teachers' performance. The same study concludes that well-structured and continuous professional development programs significantly enhance the leadership effectiveness of head teachers (Nzarugarura & Ndagijimana, 2025).

Professional development is a cornerstone of teacher effectiveness and continuous learning. Research highlights that ongoing professional learning opportunities equip teachers with the skills and knowledge necessary to improve their instructional strategies and adapt to changing educational demands. (Ibaba, 2024) found that well-structured professional development programs lead to improved teacher knowledge, refined instructional practices, and enhanced student learning outcomes. Instructional supervision should go beyond observation and include professional development opportunities. (Desimone, 2009)emphasize that professional development should be aligned with teacher needs and based on classroom observations. Peer coaching and mentoring should be integrated into supervision models to foster a supportive learning environment for teachers. (Desimone, 2009) identified five key features of effective professional development: content focus, active learning, collaboration, coherence, and sustained duration. Programs incorporating these elements have been linked to long-term improvements in teaching practices. In other words, the effectiveness of professional development programs depends on their relevance to teachers' needs and their ability to provide practical, classroom-applicable strategies. A lack of follow-up support and implementation mechanisms often reduces the impact of these programs, making it essential to integrate continuous learning opportunities with ongoing mentorship and coaching.

III. METHODOLOGY

3.1 Research Design

This study was conducted using a descriptive survey design with a mixed approach, integrating both quantitative and qualitative data. A mixed approach was used to collect and analyze data through the questionnaire, interviews, and group discussions. This was appropriate for this research to investigate the influence of instructional supervision on students' performance for Nine and Twelve Years Basic Education(12YBE) in Rwandan rural schools

3.2 Study Population and Sampling Methods

The total population consists of teachers and head teachers from 9YBE and 12YBE schools in the rural area of Rubavu District: Bugeshi, Busasamana, Cyanzarwe, Kanzenze, and Mudende. From these sectors, all 17 schools were selected, which resulted in a population of 17 head teachers and 164 teachers. This study primarily focused on 9YBE and 12YBE schools. A purposive sampling method was utilized to choose school leaders from rural areas, ensuring representation from various rural regions. Within each school, simple random sampling was employed to select teachers.

3.3 Instruments used for Data Collection

Structured questionnaires were distributed to secondary teachers to gather quantitative data on the frequency, effectiveness, and perceived impact of instructional supervision. The questionnaire included both closed-ended and Likert-scale questions to measure responses systematically. Semi-structured interviews were conducted with school leaders to explore their perspectives on the role and challenges in conducting instructional supervision. These interviews provided qualitative insights that enrich the statistical findings from the questionnaires. The document analysis was also conducted on students' Performance Reports, such as national examination results, test scores, and pass rates, to track trends of student performance among rural schools.

3.4 Data Collection Procedures

The structured questionnaire was first administered to teachers from secondary schools in rural areas, and interviews were conducted with head teachers to collect their responses on instructional supervision

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3.5 Data Analysis

To analyze the processed data effectively, appropriate computer programs were employed. Statistical Package for the Social Sciences (SPSS) was used for analyzing quantitative data, including descriptive statistics such as means, standard deviations, and percentages, as well as inferential statistics like correlation and regression analysis to determine relationships between instructional oversight and student performance. Qualitative data from interviews were analyzed thematically to identify key patterns and insights from respondents.

3.6 Ethical Consideration

According to Ndagijimana et al (2025), before data collection, the authors sought approval from the schools investigated. At school, before data collection, participants were informed about the study's purpose. All participants were given a consent form to sign and participated voluntarily in the study. Confidentiality and privacy standards were upheld throughout the process of data collection. In this study, there's no conflict of interest.

IV. FINDINGS & DISCUSSION

4.1 The findings on classroom visitation

The first question guided this study was about the extent to which classroom visitation is carried out in rural schools. Figure 1 presents the findings on how frequently the selected teachers were visited by supervisors in the class during the academic year 2024-2025.

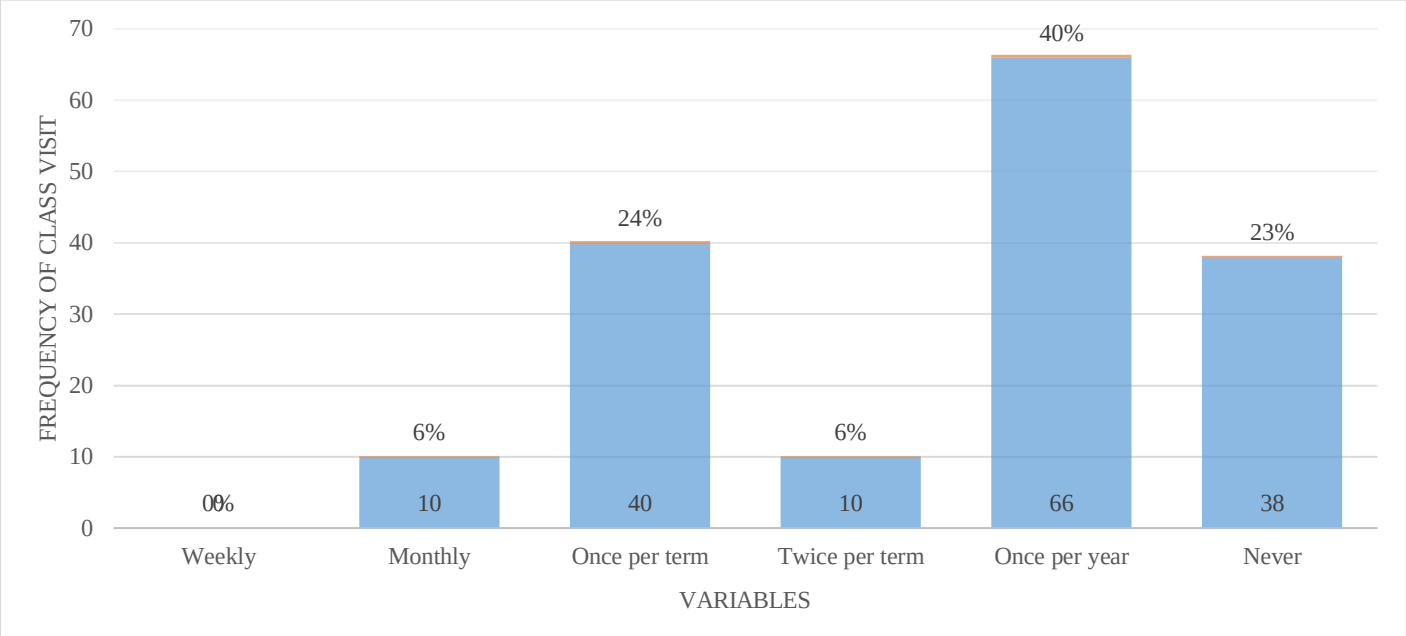

Figure 1
Class Visitation Frequency

Classroom visitation is a crucial component of instructional supervision that ensures teaching quality, provides professional support to educators, and enhances student-learning outcomes. However, as indicated in Figure 3, the data collected from 164 selected teachers regarding classroom visitation frequency highlights significant gaps during the oversight process. The findings reveal that no teachers experienced weekly classroom visits, 6% were visited monthly, 24% received supervision once per term, 6% had two visits per term, 40% were visited annually, and 23% did not receive any visits throughout the year.

These findings suggest an overall lack of consistent instructional supervision, which could negatively impact teaching effectiveness and student achievement. Among the most concerning aspects of these findings is the absence of weekly classroom visits. Regular supervision is essential for continuous professional development and the early identification of instructional challenges. Without weekly monitoring, teachers may struggle to address their weaknesses promptly, potentially leading to persistent ineffective teaching methods. In many effective education systems, weekly supervision is a standard practice to maintain high teaching standards and provide timely intervention where necessary.

Similarly, the fact that only 6% of teachers received monthly visits highlights a missed opportunity for more structured instructional support. Monthly supervision allows for a balance between oversight and teacher autonomy, ensuring that educators receive periodic feedback while still having time to implement suggested improvements.

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However, given the low percentage of teachers benefiting from this frequency, it is clear that most educators lack regular guidance and mentorship. The most common frequent classroom visitation, as reported by 24% of teachers, is once per term. While this is an improvement compared to less frequent visits, it may not be sufficient to provide consistent and meaningful instructional support. Classroom dynamics and student needs evolve continuously, and a single visit per term may not capture the full scope of a teacher's strengths and areas that need development. The 6% of teachers who received two visits per term likely had a more structured support system, but this percentage remains low and suggests that a majority of teachers are still under-supervised.

More alarming is the insight that 40% of teachers received supervision only once per year. A once-per-year visitation is inadequate for fostering professional growth and maintaining high teaching standards. Effective teaching requires ongoing reflection and improvement, which cannot be adequately addressed through infrequent observations. Teachers who receive annual visits may lack the necessary guidance to refine their instructional strategies and adapt to the evolving requirements of their students.

Perhaps the most concerning statistic is that 23% of teachers did not receive any classroom visitation for the entire year. The absence of classroom visitation raises serious concerns about the quality of teaching and learning in these classrooms. Without any form of feedback, teachers may not receive feedback on their teaching methods, classroom management strategies, or student engagement techniques. This lack of accountability can contribute to poor student performance and a decline in overall educational standards.

Table 1

Mean Frequency of Classroom Visitation

Variable	Frequency per year	Number of teachers	Total visit occurrence
No visit (Never)	0	38	0
Monthly visit	12	10	120
Once per term	3	40	120
Twice per term	6	10	60
Once per year	1	66	66
Total		**164**	**366**

Mean= $\frac{366}{164}$≈2.23 visits per year

According to Michl (2006) Instructional supervisors should conduct class visits at least once per term for each teacher to ensure consistency in monitoring and support. In a good manner, newly recruited or struggling teachers may require monthly or twice-monthly visits to help them adapt and improve their instructional skills. However, as indicated in Table 5, on average, this study revealed that the teachers from selected rural schools receive about two class visits per year**,** which is less than three classroom visits annually and suggests insufficient instructional supervision. This was supported by the findings from interviews, where the heavy workload of head teachers was the recurring theme. Many head teachers reported that administrative responsibilities limit their ability to conduct regular instructional supervision. This further exacerbates the issue of inadequate teacher support and accountability.

4.2 The Impacts of Provided Feedback on Teachers' Performance

The second question guided this study was about how the feedback provided by supervisors affects the performance of teachers.

Table 2

The Impacts of the Provided Feedback on Teacher Performance

Items	N	Mean	Std. Dev.
I always receive feedback after a class visit	164	2.56	1.35
Provided Feedback was constructive guidance for improving my teaching quality	164	2.10	1.43
I always receive negative and critical feedback	164	3.37	1.41
A follow-up is made after feedback to check whether I have implemented the feedback	164	2.39	1.44
Always, the feedback is only for signing marks, without real discussion	164	3.51	1.45

Table 2 presents findings on teachers' perceptions of the feedback they receive after class visits. The responses were categorized into Strongly Disagree (SD), Disagree (D), Neutral (N), Agree (A), and Strongly Agree (SA)**,** with their corresponding average and standard deviation values. These statistical measures provide insights into the general trends and variations in responses.

Concerning the provision of Feedback after a Class Visit (2.56, SD = 1.40**)**, the low mean indicates that feedback is not systematically provided to all teachers. Some may receive frequent feedback, while others do not, leading to

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disparities in professional support. Concerning the Constructive Feedback, the mean of 2.10 (SD = 1.35) shows that even when feedback is given, it lacks meaningful guidance. This means teachers are not receiving the necessary support to enhance their instructional practices. Concerning the characteristic of Feedback (Negative or Supportive), the relatively high mean (3.37, SD = 1.42) indicates that the responses of supervision are often perceived as judgmental and discouraging rather than developmental and supportive. The standard deviation of 1.42 indicates a moderate variation, meaning that while some teachers may receive balanced feedback, many perceive it as overly critical. When feedback is negative, teachers may resist it instead of using it to improve their teaching. Concerning follow-up on Feedback Implementation, the mean (2.39, SD = 1.38) shows that supervisors rarely conduct follow-ups to ensure that the suggested improvements have been implemented. Without follow-up, feedback loses its effectiveness. Concerning the provision of feedback as a Mere Formality, the highest mean (3.51, SD = 1.45) highlights a serious issue, as many teachers perceive feedback as just evaluative rather than an opportunity for professional growth. This significantly reduces the impact of supervision, in which the teacher feels anxious when it comes to supervision.

Overall, the high standard deviation values (1.35 - 1.45) across all items further highlight the inconsistency in how feedback is delivered**.** While some teachers might be receiving valuable feedback, many others are not. This variability suggests a lack of standardized feedback mechanisms across schools**,** meaning that the helpfulness of feedback largely depends on individual supervisors rather than a clear national framework.

4.3 The Professional Development Opportunities given to Teachers in Rural Schools

The third question guided this study was about what professional development opportunities are given to teachers in rural schools. According to Michl (2006), professional development activities for teachers can be categorized into formal and informal types. Formal activities include structured programs such as courses, workshops, and education conferences or seminars, which are typically organized by educational institutions or external organizations.

The following graph presents the findings regarding the types of professional development opportunities given to rural teachers and the extent they participate.

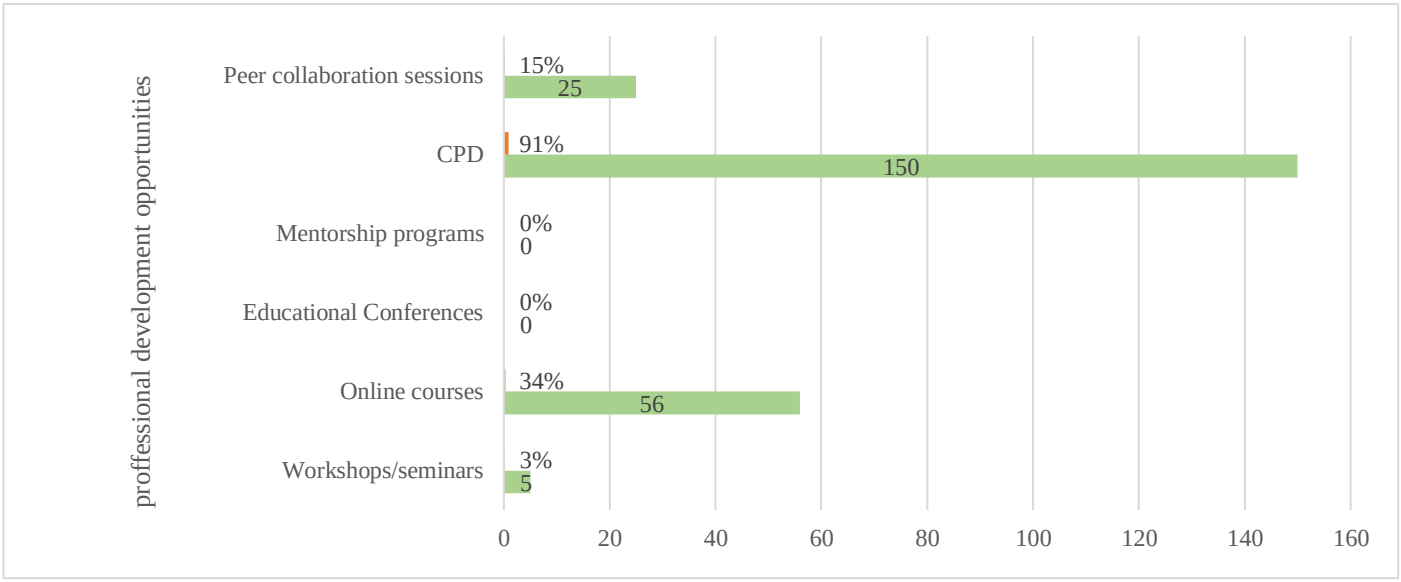

Figure 2

Bar Chat for Providing Professional Development Opportunities

The data presented highlights the various professional development opportunities provided to 164 selected teachers. The results show that Continuing Professional Development (CPD) was provided by 91%. Online courses were provided by 34%, and workshops and seminars have a remarkably low provision rate, with only 3%. Interestingly, no educational conferences or mentorship programs were provided. The results also show a low level of organization of Peer collaboration sessions, with only 15% of respondents benefiting from it.

The results from the survey on professional development participation align closely with insights from teacher interviews, concerning the implementation of CPD. While CPD records the highest provision rate (91%), interviews with teachers highlight that much of the CPD time is often repurposed by school administrators for other agenda items, limiting its intended impact on professional growth. This suggests that, despite high participation, the quality and effectiveness of CPD may be compromised when it does not focus on meaningful teacher development. The issue points to a need for stricter enforcement of CPD guidelines to ensure that allocated time is used effectively for training rather than administrative discussions.

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Additionally, concerning the preparation of training, the recurring theme from interviews was that head teachers rely on the Rwanda Education Board (REB) to organize their training sessions, rather than proactively seeking professional development opportunities. This passive approach may contribute to the lack of engagement in workshops, educational conferences, and mentorship programs, all of which recorded little to no participation in the survey. The dependency on REB trainings suggests that school leaders may not have sufficient autonomy or initiative to drive continuous learning within their schools. Without independent engagement in professional development, head teachers may struggle to support their staff effectively, reinforcing the need for policies that encourage proactive participation in training programs.

Furthermore, the low engagement in peer collaboration (15%) suggests that teachers may not have sufficient time or structured opportunities for meaningful professional dialogue. If CPD sessions are often diverted to administrative matters, likely, peer learning and mentorship programs are similarly overlooked. This disconnect between policy and practice indicates that while professional development opportunities exist in theory, their implementation is often hindered by administrative priorities as well as a deficiency of institutional support.

4.4 The Relationship between Instructional Supervision and Student Performance in Rural Schools

To assess the extent to which instructional supervision influences student performance, correlation and regression analysis were conducted. The findings from this analysis provide valuable insights into the strength, significance, and implications of this relationship.

4.4.1 Model Summary and Relationship Strength

Table 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.705[a]	.497	.434	.42188

a. Predictors: (Constant), instructional supervision

The regression model produced a correlation coefficient (R = 0.705), indicating a strong positive relationship between instructional supervision and student performance. This suggests that as the quality and frequency of instructional supervision improve, student performance also tends to increase. Furthermore, the R^2 value of 0.497 indicates that 49.7% of the variation in student performance is explained by instructional supervision alone. The remaining 50.3% may be attributed to other factors. Although R^2 provides an estimate of explanatory power, the adjusted R^2 value of 0.434 accounts for model complexity, confirming that instructional supervision remains a significant predictor even when considering potential biases. The standard error of the estimate (0.42188) further suggests that the predicted student performance scores are relatively close to actual values, enhancing the reliability of the model.

4.4.2 Significance of the Model (ANOVA Results)

Table 3

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.407	1	1.407	7.907	.023[b]
	Residual	1.424	8	.178		
	Total	2.831	9			

a. Dependent Variable: students' performance

b. Predictors: (Constant), instructional supervision

To determine whether instructional supervision has a statistically significant effect on student performance, an ANOVA (Analysis of Variance) test was conducted. The results indicated an F-statistic of 7.907 and a p-value of 0.023. Since the p-value is less than 0.05, the regression model is deemed statistically significant. This means the observed relationship between instructional supervision and student performance is unlikely to have occurred by chance. Schools and policymakers can, therefore, be confident that efforts to improve instructional supervision will likely result in better student outcomes.

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4.4.3 Regression Coefficients

Table 4

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.240	.569		3.936	.004
	Instructional supervision	.565	.201	.705	2.812	.023

a. Dependent Variable: students' performance

A deeper analysis of the regression coefficients provides further insights into the direct effect of instructional oversight. The constant term (B = 2.240, p = 0.004) represents the baseline level of student performance when instructional supervision is absent. More importantly, the coefficient for instructional supervision (B = 0.565, p = 0.023) suggests that for every one-unit increase in instructional supervision, student performance improves by 0.565 units. The standardized Beta coefficient (0.705) further confirms that instructional supervision has a strong and substantial impact. The statistical significance of the instructional supervision variable (p = 0.023) highlights its importance in shaping student success. Since this value is below the standard threshold of 0.05, it confirms that the observed effect is meaningful and not due to random variability. Schools that prioritize structured and consistent instructional supervision are, therefore, likely to see noticeable improvements in student achievement.

4.5 Discussion

4.5.1 Frequency of Classroom Visitation

The findings reveal an infrequent and inconsistent practice of classroom visitation in rural schools. On average, teachers received only 2.23 visits per year, far below the minimum once-per-term threshold recommended by scholars like Michl (2006). The data shows that 23% of teachers received no visits at all, while 40% were visited only once annually. In light of high-performing education systems, this is inadequate. For instance, in Singapore and Finland, countries with high-performing education systems, supervision is not merely administrative but developmental, with weekly or biweekly classroom observations coupled with collaborative reflection sessions (Schleicher, 2022). Similarly, in the United States, formative supervision models encourage frequent walkthroughs and instructional coaching (Tee, 2023)

By contrast, the findings from this study resemble trends observed in other Sub-Saharan African contexts, where instructional supervision is often minimal due to logistical constraints, inadequate training of supervisors, and heavy administrative workloads (Bush, 2022). This aligns with the qualitative data in the current study, where headteachers reported being overburdened with administrative tasks, limiting their ability to provide effective oversight.

4.5.2 Nature and Impact of Feedback

The findings of this study indicate that feedback following supervision is inconsistent, often critical, and largely procedural. The high mean score of 3.51 on the item "feedback is only for signing marks without real discussion" suggests a perception of supervision as a compliance activity rather than a developmental process. Meanwhile, a lower mean of 2.10 for "constructive feedback" highlights a gap in qualitative guidance that could support teachers' professional growth.

This is echoed by studies in Kenya and Nigeria, where feedback is often perceived as punitive rather than constructive, leading to anxiety and resistance among teachers (Bush et al., 2022). Conversely, in countries like Australia and the UK, instructional feedback is designed to be collaborative and formative, focusing on teacher agency, instructional goals, and student learning outcomes (Pont et al.., 2008). The lack of follow-up means a score of 2.39 further reduces the effectiveness of feedback. Research confirms that sustained support and follow-up actions are necessary for feedback to translate into improved teaching practices (Hattie, 2007).

4.5.3 Professional Development

While 91% of teachers reported receiving Continuing Professional Development (CPD), qualitative data suggests that CPD sessions are often repurposed for administrative matters, limiting their instructional value. Opportunities for workshops (3%), online courses (34%), and peer collaboration (15%) are minimal. Moreover, no mentorship or conference participation was reported. This finding reflects patterns observed in other low-resource contexts, where CPD is frequently delivered in a top-down manner, lacks contextual relevance, and is not aligned with classroom challenges (Moon, 2007). On the contrary, effective systems such as in Canada, South Korea, and Finland integrate teacher-led CPD, mentorship, and reflective practice communities into school routines, leading to sustainable improvements in teacher performance and student learning (Schleicher, 2011).

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4.5.4 The relationship between instructional Supervision and Student Performance

The regression analysis demonstrated a statistically significant and strong positive relationship between instructional supervision and student performance ($R = 0.705$, $p = 0.023$). This aligns with international studies emphasizing that consistent, supportive, and well-structured instructional supervision positively correlates with student achievement (Khan, 2024), (Ibaba, 2024). A similar study in Ghana found that schools with frequent instructional supervision and structured feedback mechanisms reported higher pass rates in national exams. Locally, studies conducted in Rwanda by Ndayambaje (2024) have also highlighted that schools with stronger supervision mechanisms tend to have better performance in learning outcomes. Similarly, the study of Livingstone (2023) discovered that there is a significantly high degree of positive correlation between instructional supervision and students' academic performance, with a Pearson coefficient of correlation of 0.529 and a p-value of 0.0000.01. However, with 49.7% of student performance variability explained by instructional supervision, the data also suggests that other factors such as teacher competence, learning materials, parental support, and socioeconomic context contribute significantly to learner achievement. Hence, improving instructional supervision must go hand-in-hand with comprehensive educational reforms.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study investigated the role and effectiveness of instructional supervision in rural schools, focusing on classroom visitation, feedback practices, professional development opportunities, and the relationship between supervision and student performance. The results reveal significant inadequate provision of effective instructional supervision practices in selected rural schools.

Firstly, the frequency of classroom visitation is markedly low and inconsistent. Teachers received an average of only 2.23 visits per year, with nearly a quarter receiving no visits at all. This falls far short of the minimum once-per-term recommendation and indicates a systemic deficiency in ongoing instructional support. The absence of regular supervision undermines teachers' ability to receive timely feedback, reflect on their teaching practices, and improve their instructional effectiveness.

Secondly, while some teachers reported receiving feedback after class visits, the nature of this feedback is often viewed as formalistic, negative, and lacking in constructive value. The absence of follow-up actions further reduces its impact on teacher performance. This suggests that supervision is perceived more as a compliance requirement rather than a professional development tool, which can demotivate teachers and limit their growth.

Thirdly, professional development opportunities provided to rural teachers are limited both in variety and quality. Although CPD participation is high, the actual content of these sessions is often diverted to administrative matters. Opportunities for workshops, mentorship, peer collaboration, and conferences are rare, limiting teachers' access to meaningful learning experiences. This reflects a broader issue of weak institutional support and a lack of initiative in fostering continuous learning.

Lastly, the regression analysis demonstrates a strong and statistically significant relationship between instructional supervision and student performance ($R = 0.705$, $p = 0.023$). This indicates that effective supervision plays a crucial role in improving learning outcomes. This underscores the critical importance of structured, supportive, and consistent instructional supervision in enhancing teacher effectiveness and improving student performance. Thus, its inadequacy or inconsistency significantly weakens the student performance. Therefore, without improvement in instructional supervisory practices, its benefits are not fully realized in rural schools.

5.2 Recommendations

The study shows that inadequate instructional supervision greatly affects student performance in rural schools. To improve education quality, policymakers, NESA, and school leaders should implement strategies to ensure regular and consistent supervision. Policymakers need to create an instructional supervision policy to ensure schools follow national standards and deliver quality instruction. NESA should also adopt virtual instructional supervision to increase efficiency. School leaders should focus on instructional supervision by regularly visiting classrooms, offering constructive feedback, and guiding teachers. Consistent implementation of CPD programs and organizing teacher collaboration sessions are essential. More research is needed to examine differences in supervision frequency and strategies between urban and rural areas and to identify challenges that hinder supervisors from conducting regular and effective supervision.

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REFERENCES

Andrews, R. L. (1991). Instructional leadership: Supervision that makes a difference. *Theory into Practice, 30*(2), 97–101.

Anyango, A. G. (2019). Influence of internal instructional supervision on teaching effectiveness in English in secondary schools in Kakamega County, Kenya (Doctoral dissertation). Maseno University.

Appiah, M. R. (2009). A study of supervision in rural and urban junior high schools in the Akuapem North district (Doctoral dissertation). University of Cape Coast. http://hdl.handle.net/123456789/1706

Bush, T., Fadare, M., Chirimambowa, T., Enukorah, E., Musa, D., Nur, H., ... & Shipota, M. (2022). Instructional leadership in sub-Saharan Africa: Policy and practice. *International Journal of Educational Management, 36*(1), 14–31.

Comighud, S. M. T., Futalan, M. C. Z., & Cordevilla, R. P. (2020). Instructional supervision and performance evaluation: A correlation of factors. *UBT International Conference, 193*. https://knowledgecenter.ubt-uni.net/conference/2020/all_events/193

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher, 38*(3), 181–199. https://doi.org/10.3102/0013189X08331140

Hanshi, A. D. (2023). Influence of instructional supervision practices on academic performance in public secondary schools in Mandera East Sub-County, Mandera County, Kenya. *African Journal of Emerging Issues, 5*(6), 151–165.

Hattie, J. (2008). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research, 77*(1), 81–112. https://doi.org/10.3102/003465430298487

Hossain, M. (2018). The effects of governance reforms on school supervision: An analysis of six developing and emerging economies. In *Cross-nationally comparative, evidence-based educational policymaking and reform* (pp. 127–160). Emerald Publishing Limited.

Ibaba, G. B. (2024). Teacher supervision and students' academic output: Performance assessment of the Bayelsa State Post Primary School Board. *Journal of Contemporary Research in Educational Administration and Management, 1*(1), 87–95.

Khan, N. P.-3. (2024). Role of supervisory instructions: Effect on school improvement. *Journal of Development and Social Sciences, 5*(3), 368–375.

Khuzwayo, Q. O. (2020). The systems theory conceptualized and pasted to teaching and learning. *International Journal for Innovation Education and Research, 8*(10), 01–16.

Livingstone, M. J. (2023). Instructional supervision and student academic performance in the history subject in public schools in Rwanda. *Journal of Education, 6*(5), 77–93.

Makau, N. N., Ronoh, A., & Tanui, E. (2016). Relationship between principals' instructional supervision and students' academic achievement in sciences in secondary schools. *International Journal of Scientific & Engineering Research, 7*(9), 1585–1607.

Michl, R. W. (2006). Supervision and evaluation of probationary teachers: Policies and practices in class II and class III Nebraska school districts (Unpublished doctoral dissertation). University of Nebraska-Lincoln. https://digitalcommons.unl.edu/cehsedaddiss/3

MINEDUC. (2018). *Education sector strategic plan 2018–2024*. Ministry of Education, Rwanda. https://www.mineduc.gov.rw/fileadmin/user_upload/education_sector_strategic_Plan_2018_2024.pdf

Moon, B. (2007). Research analysis: Attracting, developing and retaining effective teachers: A global overview of current policies and practices. UNESCO Section for Teacher Education. http://www.emergency.am/res/Virtual%20Library/DRR%20in%20Education/Attracting,_developing,_and_keeping_Teachers1.pdf

Ndagijimana, J. B., & Uwimbabazi, C. (2025). Contribution of school leaders' practices to students' academic performance in selected nine-year basic education (9YBE) schools in Rwanda. *African Quarterly Social Science Review, 2*(2), 183–197.

Ndagijimana, J. B., Musengimana, J., Mushimiyimana, H., Mukama, E., Habimana, O., Manirakiza, P., ... & Lakin, E. (2025). Contribution of an instructional module incorporating PhET simulations to Rwandan students' knowledge of chemical reactions, acids, and bases through social interactions. *Chemistry Education Research and Practice, 26*(1), 289–299.

Ndayambaje, I. N. (2024). Instructional supervision and teachers' professional practices in public secondary schools in Gasabo District. *Rwandan Journal of Education, 7*(2), 71–84.

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NESA. (2023). Report on analysis of general education, TTCs, and TVET national examination results for 2019–2022. *National Examination and School Inspection Authority*. https://www.nesa.gov.rw/

Nirere, J., Ntawiha, P., & Buhigiro, J. L. (2023). Influence of primary school head teachers' instructional leadership on teachers' professional practices in Musanze District, Rwanda. *East African Journal of Education and Social Sciences, 4*(3), 143–150. https://doi.org/10.46606/eajess2023v04i04.0312

Nizeyimana, G., Nzabalirwa, W., Mukingambeho, D., & Nkiliye, I. (2020). Hindrances to quality of basic education in Rwanda. *Rwandan Journal of Education, 5*(1), 53–67.

Nsengimana, A. S. (2024). Head teacher's instructional supervision in public primary schools of Nyaruguru District, Rwanda: Challenges and mitigations. *African Journal of Empirical Research, 5*(3), 629–639.

Nzarugarura, M. E., & Ndagijimana, J. B. (2025). Effects of head teachers' professional development programs on effective school leadership: A case of secondary schools in Rubavu district, Rwanda. *African Journal of Empirical Research, 6*(2), 504–521.

Pont, B., Nusche, D., & Moorman, H. (2008). *Improving school leadership, volume 1: Policy and practice*. OECD Publishing. https://doi.org/10.1787/9789264044715-en

Schleicher, A. (2022). Lessons from high-performing school systems. In *International Handbook on Education Development in Asia-Pacific* (pp. 1–19). Springer Nature Singapore.

Schleicher, A. E. (2011). *Building a high-quality teaching profession: Lessons from around the world*. OECD Publishing. https://doi.org/10.1787/9789264113046-en

Sergiovanni, T. J., & Starratt, R. J. (1993). *Supervision: A redefinition*. McGraw-Hill Inc.

Tee, A. (2023). Establishing trust in principal supervision: Qualitative exploration of walkthroughs for instructional leadership. American College of Education.

Van Bertalanffy, L. (1998). *General system theory: Foundations, development, applications*. George Braziller.

Vasconcellos, E. A. (1997). Rural transport and access to education in developing countries: Policy issues. *Journal of Transport Geography, 5*(2), 127–136.

Wilczenski, F. L.-A. (1987). Feedback to teachers on student engagement as a consultation tool. *Professional School Psychology, 2*(4), 261.

Yosief, Y., Okemasisi, K., & Mesmer, P. (2022). Establishing how head-teachers' classroom visitation practice influences students' performance in public junior schools in Keren Sub-Zone, Eritrea. *European Journal of Special Education Research, 9*(6), 150–172. http://dx.doi.org/10.46827/ejse.v8i3.4342

Zepeda, S. J. (2013). *Instructional supervision: Applying tools and concepts* (3rd ed.). Routledge. https://doi.org/10.4324/9781315855523

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The influence of extramarital sexual relations on marital stability: A case study of the Anglican diocese of Butere, Kenya

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ABSTRACT

Extramarital sex [EMS] is a persistent dialogue and an intriguing phenomenon among nouvelle Christians across the globe. The Anglican church remains perplexed and antagonized by the blooming of unstable marriages as a result of EMS practices and is left in a quandary on how to combat them. Christianity emphasizes fidelity in marriage, and biblically EMS is considered sinful. This study sought to establish the influence of EMS on marriage stability among Christians in the Anglican Diocese of Butere, Kakamega, Kenya, and as a way to devise appropriate measures to mitigate the problem. The study specifically examined the biblical and theological teachings on extramarital sex and proposed effective mitigating measures to curb extramarital sex relations in the Anglican Diocese of Butere, Kakamega, Kenya. The utilitarianism theory guides the study. A descriptive research survey design was adopted, and qualitative and quantitative slants were employed in the methodology. Stratified sampling was used to group the 7175 targeted members into the married, clergy, and church leaders. Purposive random sampling was utilized to select the married, while stratified purposive sampling was employed in clergy selection, giving a representative sample of 348 respondents. Primary data was obtained using questionnaires and interviews, while relevant literature was explored to derive secondary data. Inferential and descriptive statistics were used in the analysis of quantitative data. Explanatory variables were discriminated by the categorical principal of component analysis facilitated by SPSS version 20 software. Qualitative data was analyzed and thematically organized. The study was premised on Jeremy Bentham's utilitarianism theory. The study found that the biblical teachings on extramarital sex relations were well agreed on, indicating they positively contributed to marital stability, as supported by a coefficient of variation on biblical and theological teachings ($r = .334$, p-value $= 0.000 < 0.05$). This study concluded that there existed a moderate positive relationship between the dependent variable (marital stability) and the independent variables (extramarital sexual relationships). From the conclusion, the study derived both policy and practical recommendations based on the specific objectives. The study recommended that biblical and theological teachings should be harmonized with pastoral guidance and counseling to married couples so as to make them well informed of extramarital sexual relationships and why they are discouraged. On providing solutions to extramarital engagements, discipline and self-control were paramount; hence, teachings, guiding, and counseling among victims; preaching of moral behavior; change in natural behavior; and avoiding lust as well as myths regarding extramarital benefits would be ideal. Church leaders should concentrate on building morals.

Keywords: Anglican Diocese, Biblical and Theological Teachings, Extramarital Sexual Relations, Marital Stability

I. INTRODUCTION

Extramarital sexual relations have taken center stage in most societies of today and bring in their wake devastating consequences both on individual family members and society at large. The study explores how extramarital affairs affect marriage stability using a case study of the Anglican Diocese of Butere, Kakamega County, Kenya. It aims to establish some of the causes and recommend militating against the practice, anchored in biblical, theological, and sociological insights.

Marriage, highly regarded both in Christian doctrine and traditional African society, is based on vows of fidelity. However, despite such a sacred commitment, extramarital relations are increasingly jeopardizing the stability of marriages. According to Gordon and Mitchell (2020), the Coronavirus Disease (COVID-19) pandemic made the situation worse since the increased stress levels became contributing factors to infidelity. Such behavior has wider consequences, influencing not only the couples themselves but also their children and society.

The marital stability may be based on different aspects, including adherence to religion, education, and socio-economic background, as is depicted by the study of Yesmen and Nahid (2002). However, extramarital relations have grown worldwide, as indicated by the Durex Global survey, where 22 percent of the world's population had confessed

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to having illicit affairs. The consequences of such affairs are so prevalent, which causes psychological and emotional trauma among the affected spouses, children, and even their close relatives.

Infidelity is also consistently reported by therapists as one of the most challenging issues to work through in therapy. As Klassen *et al*. (1989) have noted, the rates of male and female infidelity have become more equivalent in the U.S.; whereas in the past, men predominantly engaged in affairs, recently women's involvement has increased substantially. This new reality presents different demands on marital therapists and certainly calls for valid intervention.

In addition, several other studies, like Atkins *et al.* (2001), suggest that males are more likely to indulge in extramarital relations as compared to females. However, recent studies, like Scelza (2024), challenge this conventional concept of male promiscuity, presenting a higher number of female cases of infidelity. These studies depict that economic independence, peer influences, and emotional dissatisfaction are some of the social factors for increased instances of infidelity in both males and females.

Indeed, extramarital relations are high in Kenya. According to a report by Mpasho News in 2019, 50% of men who go for paternity tests at the government chemist are not the biological fathers of their children; this is attributed to infidelity. This always leads to conflicts and psychological damage to the children. Oladi *et al*. (2016) believe that extramarital relations contribute to emotional instability, breakdowns in communication, and marital dissatisfaction, which exacerbate the problem.

The current trends have not left behind the Anglican Diocese of Butere. From statistics, an alarming trend shows divorce and separation attributed to infidelity. The church has, to this end, proposed policies to tame extramarital affairs, which include premarital counseling and marital workshops. These focus on nurturing open communication and trust, with a keen adherence to biblical imperatives that are fundamental in mitigating such infidelity. In addition, the church promotes discipline and control as some of the necessary precautions to avoid affairs. Through the clergy members, the church recommends continuous counseling and moral advice to reinstate stability in the marriages.

Despite such attempts, many challenges persist: financial burden, constant separations for indefinite periods, and peer pressure remain some common factors that predispose individuals to extramarital relations, as evidenced in the study by Idoko (2018). However, marital fidelity and stability can be encouraged through interventions involving role modeling and continuous guidance by church leaders. As Lau and Miles state, numerous good examples of role models through the church can help illustrate to couples that faithful and committed relationships will last. Basically, working with the problem of extramarital relations can be a multidirectional activity: limitation of such trauma's influence on family life, stabilization of the institution of marriage with the help of biblical teachings, regular counseling courses, and emphasis on socially important values.

1.1 Statement of the Problem

Christianity teaches that married couples are required only to have sexual intercourse with their spouses. Engaging in sexual activities with anyone else is considered a sin as it violates God's commandment against adultery. Regardless of the issues that may arise in marriages, couples should find ways of overcoming them and remaining committed and dedicated to their marriage vows (Otubah, 2023). As the societal moral compass, the church has been threatened over the years by the monster of infidelity among couples wedded in Holy matrimony, and the Diocese of Butere is no exception. This is evident from the recent Diocesan statistics whereby the church recorded 413 divorced/separated couples, 90% of which were a product of infidelity, with 44 married Christians undergoing counseling on infidelity cases (Oyetade, 2020). The practice of extramarital sex among married couples goes against the Anglican biblical teachings, liturgy and policy of marriage which emphasizes on absolute fidelity, love and respect in marriage. The Anglican Church of God (A.C.K) Christian families affected in the Diocese of Butere claim irresponsible, violent partners and financial struggles as some of the contributive factors to the behavior. Affected families have ended up divorced, separated and with children lacking positive role modeling hence ending up psychologically affected in their upbringing (Idoko, 2018). This poses a threat to the future sanctity of marriage the church professes as affected children raised in such families are likely to have a negative outlook of marriage as an institution. Emphasis on marriage preparation inclusive of counseling has not been nurtured from the grassroots but only a few days to the wedding day. Young people are told to remain pure through abstinence until marriage but lack guidance on the foundational Christian values that dictate a stable marriage and serve as a guide in choosing a marriage partner before marriage. Owing to the rising prevalence of extramarital sex relations incidences among Christians in the Anglican Diocese of Butere, minimal efforts have been made in devising measures to mitigate the problem.

1.2 Research Objective

i. To examine the Biblical and theological teachings on extramarital sex relations.
ii. To find effective mitigating measures to curb extramarital sex relations on marriage stability in the Anglican Diocese of Butere, Kakamega, Kenya.

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1.3 Research Question

i. What are the Biblical and theological teachings on extramarital sex relations?
ii. What effective mitigating measures can be employed to curb extramarital sex relations on marriage stability in the Anglican Diocese of Butere, Kakamega, Kenya?

II. LITERATURE REVIEW

2.1 Theoretical Review

The Utilitarianism Theory guides the study. The theory was developed by Jeremy Bentham (1747-1832) to explain the morality of actions and behavior in society. According to this theory, actions are considered on whether or not they promote the attainment of happiness or pleasure Sinha (2020). Actions or behaviors that promote higher levels of happiness are considered morally correct, while behaviors that promote pain and unhappiness are morally wrong. In extramarital sex, the behavior contributes to pain and unhappiness towards the spouse that has been affected by the behavior and is, therefore, immoral, according to this theory. Since it is immoral to cause pain and unhappiness to another person in a marriage, engaging in extramarital sex is unacceptable in society, and it can have significant adverse impacts on the institution of marriage (Aziz, 2021). According to this theory, infidelity, which also involves extramarital sex, is immoral owing to the pain and suffering that the spouse is exposed to and the resultant outcomes of this behavior on the whole family unit. Extramarital sex is when a married person, in any marriage setup, engages in sexual intercourse with another married or unmarried person other than their spouse. According to Tuelo (2019), extramarital sex is committed by both men and women across the world, even though most of the cases involve men more than their female counterparts. There are various scriptural foundations against extramarital affairs in the Bible, and Christian teachings admonish any engagement in sexual intercourse among people who are not married. In Christian marriage, the husband and wife commit fidelity to each other as long as they live, and this promise is broken when one or both parties engage in sexual activities with people they are not married to.

With less satisfaction in marriages, most partners end their companionship and seek other alternatives, such as getting into other marriages or staying out of marriage. Dissatisfaction in marriage entails being discontented with the partner that the person is married to, which, in turn, can negatively impact intimacy and the level of commitment to each other. Infidelity occurs when one partner is not faithful in marriage and has one or multiple sex partners outside marriage. According to Sabatelli et al. (2020), infidelity significantly undermines the foundation on which marriage is built and sustained. It has been established that extramarital sex negatively affects the quality of intimacy between partners in a marriage, and since intimacy is an essential aspect of marriage, the foundations of marriage are significantly damaged when such practices occur. Hernandez-Kane and Mahoney (2018) reveal that the emotional involvement in extramarital sex by partners also diminishes their levels of commitment to the marriage and their will to stay in the marriage.

2.2 Empirical Review

2.2.1 The Biblical and Theological Teachings on Extramarital Sex Relations

The Old Testament teaching on extramarital sexual relations: The beginning chapters of Genesis provide a clear guide map for God's original design of marriage. God's command to Adam and Eve in Genesis 1:22," *Be fruitful and multiply*," is happily adhered to by the husband and wife after they are enjoined together in marriage; hence, Genesis 2:24 records: "*A man leaves his father and mother and is united to his wife, and they become one flesh.* "It is only after the occurrence of marriage that Adam made love to his Wife, Eve, in Genesis 4:1.Sex was, hence, from the onset of the world, reserved to be enjoyed within the confines of marriage.

Dillow *et al.*(2013) emphasize that God originally intended sex to be naturally enjoyed within the marriage context, sublime and free from troublesome experiences. He, therefore, directly addresses the confusion in the modern world and the frustrations surrounding sex, inclusive of infidelity. It was noted that improvement in sexual relationships between husband and wife will go a long way to improve marital stability by reducing stress and frustrations.

According to Sanger (1926), many modern marriages fail due to ignorance and misuse of sex that is supposed to be enjoyed within the marriage. She emphasizes the central significance of sex in marriage life and as a necessity of keeping the marriage fire alive. Her sentiments are later backed up by Van de Velde (2013), who argues that the forces of mutual attraction in marriage and its sustainability can be improved through evolution and improvement of physiological relationships. He strongly pictures a happy and stable marriage built on discipline, which involves shunning extramarital sexual affairs.

Exodus 20:14 records *'You shall not commit adultery"*. Adultery is one of the sins that God warns the Israelites against through the Ten Commandments, which indicates his position on the issue and why every person must abstain from engaging in extramarital sex. In the Old Testament, adultery was punishable by death.

Mckeever (2020) opines that extramarital sex is erroneous if it breaks the initial commitment made, especially in monogamous marriages, to be sexually exclusive. Adultery, therefore, is highly condemned due to the unique

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significance that the commitment has in the marriage relationship. Adultery hurts and takes the form of deception. Adultery is wrong even if the person cheated on never finds out and so not hurt or finds out but is not hurt because they were also cheating or do not mind.

According to Rokach. *et al.* (2023), cuckoldry not only leads to separation and divorce but could also negatively impact emotional euphoria manifested in the form of low self-esteem and depressive symptoms. This poses an elated risk of the breach of stipulated biblical moral conduct, thus leading to excessive drinking, heightened sexual immorality, and suicidal conduct in response to emotional torture.

Karadzhy and Tsurkan-Saifulina.(2023) noted the betrayal aspect of adultery by the perpetrator to the person who trusted them the most. Women especially find it hard to devise strategies to cope with adultery occurrences in marriage. These include but are not limited to avoidance of their partners, confronting them harshly, and, in extreme cases, opting to walk out of the marriage. Adultery is therefore frowned upon and harshly condemned biblically due to the negative impact that comes along with it and God's intent that marriage lasts until death.

Proverbs 6:32 says, "*But a man who commits adultery has no sense; whoever does so destroy himself.*". In Proverbs 6:27-29, the bible compares a man who goes out with his neighbor's wife to a man who carries fire next to his chest or walks on hot coal. The Bible is evident in its admonition against adultery and warns that one only destroys oneself when one engages in adulterous behavior, which indicates that there are dire consequences for all actions that relate to adultery among married couples.

Barrat (1965) presents a clarifying incident on the possibility of profound adverse effects of adultery on oneself. In a combination of characters, he presents a mixture of guilt and feelings emanating from the betrayal of one's spouse that escalated into suicide. Infidelity seriously alters the solid and happy marriage previously enjoyed by the perpetrator, resulting in them being trapped by their sin and, ultimately, a broken marriage. According to Hunt (2013), drawing from King David's experience with Bathsheba in 2nd Samuel 11, His assertions support that adultery indeed culminates into the heaviness of heart and guilt. Just like King David, the behavior potentially results in sorrow and withdrawal of God's blessings from a marriage formerly ordained and blessed by God. It only takes the intervening mercies of God through prayer and repentance for redemption to rebuild the broken covenant relationship.

According to Kavulavu *et al.* (2020), a lack of exposure to the biblical concepts of marriage and why God designed sex can be a significant reason for individuals to engage in extramarital sex with people outside marriage.

From a Christian perspective, biblical teachings offer a strong foundation on which stable marriages and lasting relationships can be built. Having access to biblical teaching and guidance that is rooted in the Bible and religious beliefs can help individuals resist temptations to sin and, by extension, protect them from engaging in extramarital sex. However, Kwena *et al.* (2022) argue that even some of the people who are well-educated on Christian values still engage in extramarital sex, and it is not enough to teach about adhering to biblical teachings.

The New Testament teaching on extramarital sexual relations: In the New Testament, extramarital sex is considered sinful, and man is admonished against engaging in sex outside marriage. Paul says in Hebrews 13:4,

> "*Let marriage be held in honor among all, and let the marriage bed be undefiled, for God will judge the sexually immoral and adulterous.*"

The New Testament does not at any point acknowledge any situations or circumstances where extramarital sex can be justified, which serves to warn Christians not to engage in sex outside marriage, regardless of the temptations or factors that may arise. Oyetade (2020), drawing from the book of Hebrews, pictures marriage as a gift and a blessing from God. However, the constant attack is directed at the honor and sanctity of marriage. Infidelity is a significant problem, proven by heightened divorce rates. God's judgment awaits those who dishonor marriages and maintenance of marital purity. According to Morris (1983), the Bible teaches that God blesses a marriage between one man and one woman. Where possible, it is the will of God that both give birth. Maintaining holiness of thought and flesh desires is vital since both the adulterer and the adulteress will face God's judgment. His assertions are later emphasized by Medeiros (2023), who critically analyses honor as something so precious and possessing exceptional value. Conservation of the marriage bed will ensure the protection of sexual love from perversion. Jesus Christ, in the New Testament (Mathew 26), warns Christians not to fall into temptation that would ruin their relationship with God. Since sex outside marriage is already one of the sins admonished, he warns against it. In 1 Corinthians 7:2, Paul writes,

> "*Because of the temptation to sexual immorality, each man should have his own wife and each woman her own husband*. "

This indicates his strong opposition to sex outside marriage and the need for each person only to have one sexual partner to whom they can be faithful. To the people who are not married, Paul also encourages them to marry, and this illustrates why they should not have sexual relations with people who are already married. Paul demonstrates that the only way sex is acceptable is when it occurs within the marriage institution. Christians should not satisfy their sexual passion by having sex with anyone who is not their spouse. Medeiros (2023) compares a house lacking a foundation to a marriage without fidelity. This poses a threat of crumbling down at any unannounced time since the disrespect that comes in the form of infidelity is the impetus for divorce. Marriage partners are advised to stick to each other in honoring their vows and ensuring their marriage stands on a solid foundation.

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According to Otubah (2023), most young people no longer appreciate the biblical teachings on sexual purity before and after marriage. Marriage is sacred, and the marital covenant relationship must be exclusive to ensure its permanence. Cheating is highly disapproved from a moral stance. Maddock (2022) present infidelity as the worst transgression that a married couple can make against each other and is often considered a sinful act. Faithfulness is therefore highly emphasized in marriage for the maintenance of peace and, ultimately, stability in the marriage.

Paul teaches in 1Thessalonians 4:3 that

> "*it is God's will that you should be sanctified: that you should avoid sexual immorality; that each of you should know how to control their body in a way that is holy and honorable and not in passionate lust like the pagans who do not know God*." In Revelation 14:8, it is written that "*Fallen, fallen is Babylon the great, she who made all nations drink the wine of the passion of her sexual immorality*."

This is an indication of the wrath of God towards men and women who engage in extramarital sex and other forms of sexual immorality. Anderson (2008) equates the husband-and-wife relationship in a marriage setting to the covenant relationship between human beings and God. There are two interrelated reasons why the bible prohibits infidelity. God's plan for the sanctity of human marriage is violated through unfaithfulness. The 'one man and one-woman image is blemished in the occurrence of extramarital sex, thus shattering God's design. Infidelity defaces the loving, pure, and committed image of God's covenant relationship with his people that marriage was designed to portray.

Gary (2015) takes us back to rethink God's original intention of designing marriage. What if marriage was designed to make us holy more than to make us happy? God's wrath is kindled against those who break the vows by engaging in extramarital sex from a biblical perspective since he is more focused on the sacredness of marriage as a covenant and the holiness it is expected to depict. According to Njiru and Purkayastha (2018), sex outside marriage is among the most extensive prohibitions in Christianity because it goes against God's biblical design of marriage and his true intention for sex.

2.2.1 Effective Strategies to Mitigate Extramarital Sex Relations and enhance Marital Stability

The church's role as the custodian of society's moral fiber cannot be overestimated. For ages, the church has been society's moral compass and helped shape values and ethics that continue to hold the moral fabric. Church leaders play a pivotal role in influencing the choices made by members, including their decision to stay faithful to their spouses and refrain from extramarital sex. The church and church leaders are the light of the world according to the bible and, therefore, must ensure that good morals in society are preserved and that the minds of church members are transformed to maintain marital faithfulness and sexual purity.

Counseling: Church leaders acknowledge that the stability of the church depends on the stability of the family, and extramarital sex is a significant threat to the sustenance of the family. The church is, therefore, responsible for preserving families by offering teachings and counseling that enhance stability within the family. Baker (2019) confirms the instrumental role of church leaders in spearheading Christian counseling sessions. These have been noted to have a high positive impact on Christian marriages, thus ensuring stability. Stability, in this case, sums up marriages that are free from extramarital engagements leading to domestic violence, separations, and divorce. There exists a positive response on the side of religious couples when their religious concerns and values are included in their marriage therapy. Church leaders who blend spirituality within their marital therapies, seminars, and build-up classes provide couples with a firm foundation to build their marriage into future sustainability.

According to Silo (2022), Christian counseling is an essential aspect of the church that provides an avenue for Christians to receive guidance on how to remain faithful to their spouses and avoid illicit sexual relations. Premarital counseling is one of the areas that church leaders and counselors are using to prevent the prevalence of extramarital sex among Christians. The provision of premarital counseling helps to lay the desired foundation of values and morals that Christians can rely on in their marriages to avoid sexual infidelity. Premarital counseling by church leaders reminds couples about God's involvement in their marriages, which is aimed at helping them gain the motivation to continue growing together and attaining stability.

According to Kumar (2023), premarital counseling is crucial because it helps couples get their marriages off to a positive start and reduces some of the risk factors for extramarital sex activities. The Christian counselor often advises marriage commitment, the importance of a life-long perspective, and the readiness to make sacrifices. The couples learn the inevitable nature of conflict in marriages, which is healthy when resolved adequately.

Role-Modelling: According to Lau and Miles (2023), role modeling is also a measure that churches worldwide have used to foster unity and commitment of spouses to each other. Role models are described as exceptional people who can be emulated because of their values, ethics, and morals as regards faithfulness in marriage. Church leaders can help address extramarital sex issues through the identification of such exceptional couples and using them as examples that all congregants can emulate. The church leaders also encourage couples to attend church services where they get opportunities to get in contact with monogamous and happily married Christians. Role models in the church setting are usually couples that have been together for several decades and have adequate experience to mentor newly-wed couples. Despite extramarital sex stemming from a variety of causal factors inclusive of personal choices and economic

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hardships, among others, the church still stands overestimated on the salient role it plays in ensuring stability in holy ordained marriages propelled by the church leaders.

Seminars and Workshops: According to Robinson et al. (2018), church leadership is uniquely positioned to enhance marriage stability through mentorship programs, well-targeted and intense outreach that ensures healthy relationship modeling, and broad and welcoming access to counseling before marriage. Church leaders can be instrumental in formulating and implementing initiatives to strengthen family relationships.

According to Kumar (2023), Christian marriage seminars and programs organized by the church leadership are also avenues that the church can use to provide relevant guidance to married couples regarding extramarital sex. The Anglican Church and many other churches around the world organize marriage seminars that bring together couples to get teachings on what the bible says about extramarital sex and why they ought to avoid sinful activity. One of the topics taught during most church seminars on marriage is the issue of commitment to the marriage and why spouses are expected to remain faithful to each other at all times. Marriage seminars enhance marriage commitment, ensure the couple has adequate communication skills, and strengthen relationship behaviors to mitigate extramarital affairs. Based on sentiments opined by Dollahite and Lambert (2007), religious guidance facilitated by church leaders in various workshops and seminars within the marriage setting highly contributes to fidelity in marriage in various dimensions. The religious practices and beliefs emphasized by the church leaders contribute to marital sanctification, resulting in high marital quality, thus indirectly enhancing fidelity. Religious teachings emphasize moral values among couples. The strong Godly relationship built in marital therapies organized by church leaders discourages infidelity as an act that displeases God and is punishable.

III. METHODOLOGY

3.1 Research Design

The research design adopted for the investigation is a descriptive research survey because, in conducting an in-depth analysis in regard to how extra-marital relations affect the stability of marriage within the Anglican Diocese of Butere in Kakamega County, Kenya, it combined both qualitative and quantitative approaches. In this approach, one systematically collects detailed information from participants about their experiences and attitudes towards marriage and fidelity without manipulating existing conditions. In-depth interviews were adopted for the qualitative approach, while for quantitative, structured questionnaires were used for data collection.

3.3 Target Population

The target population for the study included 7,175 individuals comprised of married couples amounting to 6,931, 180 church leaders, and 64 clergy in the Anglican Diocese of Butere. These are the targeted groups due to the fact that they have direct dealings with marriage and counseling within the Church Community (Mugenda & Mugenda, 2003). Extramarital relations are most disrupting to married Christians, and this study limits its scope to them, in addition to church leaders and the clergy, who form the most important agents of change.

3.4 Sample Size and Sampling Technique

Stratified, purposive random, and purposive sampling methods were used to establish a sample size of 348 respondents. A stratified random sampling method was used to represent each of the six deaneries in the diocese. The married people were selected using purposive random sampling, while the church leaders and clergy were selected using purposive sampling, bearing in mind that they were in leadership positions and could inform on the response of the church to infidelity. A sample size of 324 married people, 18 church leaders, and 6 clergy was used to represent the variation in perspectives within the diocese.

3.5 Data Collection Instrument

Two main tools were used for data collection: structured questionnaires and semi-structured interview guides. These questionnaires were administered to married subjects and had statements to which the respondents could indicate their level of agreement or disagreement regarding fidelity, communication, and marital satisfaction using the Likert scale. Semi-structured interview guides were used during the in-depth interviews with church leaders and clergy, exploring sensitive and complex issues regarding extramarital relations and the role of the church in mitigating their effects.

3.6 Data Collection Procedure

The actual data collection was done for a period of three months after the ethical approval by NACOSTI among other relevant authorities. First, the pilot study was done to determine the reliability and validity of the research instruments through adjustments. The major data collection involved personal face-to-face interviews and administering

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questionnaires. Confidentiality and anonymity were guaranteed in participation to ensure candid responses, especially since the subject matter is somewhat sensitive.

3.7 Data Analysis

Frequencies, percentages, and measures of central tendency were used to analyze quantitative data from the questionnaires. Pearson's correlation coefficient was used to ascertain the relationship between extramarital relations and marital stability. An attempt to explore the key variables-for instance, biblical teachings and church policies regarding the subject matter, along with contributive factors to infidelity-was also made through factor analysis.

Qualitative data were analyzed using thematic analysis. Interviews were transcribed, coded, and analyzed using NVivo software in order to find repeated themes and patterns in participant responses. In so doing, the research was able to dig deeper into mitigating factors and the influence of the church on marriage stability.

3.8 Ethical Considerations

The study followed strict ethical guidelines whereby participants were fully informed of the aim of the study and their right to withdraw at any stage without consequences. Informed consent in writing was obtained from all participants, and confidentiality was maintained throughout the study. The research also ensured cultural sensitivity, particularly in handling sensitive topics such as infidelity, by working closely with church leaders in approaching the subject matter appropriately.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study presents a response rate on questionnaire return rate and interviews responses; this is provided as shown.

Table 1

Response Rate

Questionnaires	**Frequency**	**Percentage**
Response	324	100
None response	0	0.0
Total	324	100.0
Interviews		
Church leaders Response	14/18	77.8
Clergy Response	6/6	100

From 324 questionnaires distributed all were filled and returned indicating a response rate of 100%. The study also found that 14(77.8%) Church leaders responded as all clergy responded in interviews.

4.1.1 Biblical and Theological teaching on Extra-marital Sex

The researcher sought to examine the Biblical and theological teachings on extramarital sex relations. A five (5) Likert Scale was used where one (1) implied the least and five (5) the highest positive response (1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A), 5 =Strongly Agree (SA) was used in the analysis of data. The results of the Likert Scale were shown in table 2.

Table 2

Biblical and Theological Teaching on Extramarital Sex

Description	**N**	**SD (%)**	**D (%)**	**N (%)**	**A (%)**	**SA (%)**
According to genesis 1&2, God created one man for one to live together till they are separated by death.	324	4 (1.2)	0 (0)	108 (33.3)	66 (20.4)	146 (45)
In Exodus 20:14 Christians should not commit adultery	324	4 (1.2)	16 (4.9)	60 (18.5)	150 (46.3)	94 (29)
Extramarital sex or infidelity can lead to divorce (Mathew 19:9)	324	4 (1.2)	82 (25.3)	74 (22.8)	140 (43.2)	24 (7.4)
Marriage is to be held in honor among all, and the marriage bed is to be undefiled (Hebrews 13:4-6)	324	0 (0)	70 (21.6)	100 (30.9)	112 (34.6)	42 (13)

From Table 2, the results showed that 66(20.4%) agreed as 146(45%) strongly agreed that in Genesis 1 & 2, God created one man for one to live together. Regarding whether in Exodus 20:14 Christians should not commit adultery150(46.3%) agreed as 94(29%) strongly agreed. Results showed that 140(43.2%) agreed 24(7.4%) strongly agreed that extramarital sex or infidelity can lead to divorce (Mathew 19:9), 112(34.6%) agreed as42(13%) strongly agreed that marriage is to be held in honor among all, and the marriage bed is to be undefiled (Hebrews 13:4-6). The biblical teachings on extramarital sex were well agreed on indicating they positively contributed to marital stability.

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This confirms that it was wrong to engage in extramarital sex. Furthermore, most respondents indicated yes that extramarital activities indicated marriage instability. Interviews conducted revealed that teachings based on the bible and theology improved marital stability. One of the church leaders Church Leader (CL) (CL-001) stated

> "*Even though I give teachings to members some members do not take them seriously contributing to ignorance that leads to certain cases of extramarital sexual relationships being reported among church members,'.*

A member of the clergy (CL-001) noted that

> "*I often include teachings on infidelity in my premarital counseling sessions though not so deep but the couple is usually too excited to take them seriously until when it happens to them then they come back crying, stressed and sometimes divorced* ".

These findings are in agreement with Proverbs 6:32 which says,

> " *But a man who commits adultery has no sense; whoever does so destroy himself.*

This is evident through clergy and church leaders' statements on the stress and emotional damage caused by infidelity. These findings also support the assertions made by Sanger (1926) that most modern marriages break down due to ignorance and misuse of sex that is supposed to be enjoyed within the marriage context. God hates divorce. The Anglican marriage policy that seeks reference from the bible frowns at infidelity since it serves as a gate pass to divorce. (CL-006) noted that

> I *cannot advise couples to divorce when conflicts arise or whatever cause. I can only advise forgiveness and change of behavior since Christ also taught we should forgive seventy-seven times seven times."*

Buthelezi (2021) drawing from Anglicanism and marriage from the ancient times emphasizes the lifelong-defining nature of marriage strongly held by the Anglicans and featured in the constitution as well as the liturgy. Christians specifically married Anglicans in the Dioceses of Butere should therefore go back to the crossroads, look for the ancient path of fidelity, and walk on it. By adhering to biblical teachings on the effects of infidelity and related theological insights, stability will be ensured.

4.1.2 Effective Mitigating Measures to Curb Extramarital Sex

The researcher sought to explore effective mitigating measures to curb extramarital sex in the Anglican Diocese of Butere, Kakamega Kenya. A five (5) Likert Scale was used where one (1) implied the least and five (5) the highest positive response (1=Strongly Disagree (SD), 2=Disagree (D), 3=Neutral (N), 4=Agree (A), 5 =Strongly Agree (SA) was used in the analysis of data. The results of the Likert Scale were shown in table 3.

Table 3

Effective Mitigating Measures to Curb Extramarital Sex

Description	N	SD (%)	D (%)	N (%)	A (%)	SA (%)
Christian teachings can lower extramarital sex prevalence	324	0(0)	36(11.1)	114(35.2)	146(45.1)	28(8.6)
Societal values and morals can help address EMS(Extra Material Sex)	324	0(0)	56(8.6)	128(19.8)	154(47.5)	78(24.1)
Partners should stay together to avoid engaging in EMS	324	0(0)	28(8.6)	78(24.1)	114(35.1)	104(32.1)
Family members should condemn EMS	324	0(0)	36(11.1)	46(14.2)	150(46.3)	92(28.4)
Extramarital sex should never be justified	324	0(0)	8(2.5)	108(33.3)	164(50.6)	44(13.6)

The study findings in table 3 showed that 146(45.1%) agreed that Christian teachings can lower extramarital sex prevalence, 154(47.5%) noted that Societal values and morals can help address EMS, 114(35.1%) agreed that partners should stay together to avoid engaging in EMS, 150(46.3%) agreed that family members should condemn EMS as 82(50.6%) extramarital sex should never be justified. Ndungu (2017) observed that a few couples could courageously face infidelity cases amongst themselves and find an amicable way of sorting out their differences hence the need to seriously look into the effective mitigating measures against it.

Ghoreishi (2018) observed that individuals whose spouses engaged in infidelity were always made to feel like the offenders by the society. In so doing, the offender is encouraged to continue with the vice at most if it is a male parent involved. If family members and the society stand to condemn infidelity occurrences and emphasize on values and good morals, then this will go a long way to ensure stability in those marriages. The findings also agree with Kavulavu *et al.(*2020) who observed that lack of exposure to biblical teachings on marriage and why sex was designed by God could be a contributive factor to extramarital sex. Christian teachings should be emphasized in pre- and post-marital counseling since sex outside marriage goes against God's original design for marriage and true intention for sex. A church leader (ChL-006)during interviews stated

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> "*When given a platform to preach or teach, sometimes I choose topics related to marriage and biblical texts to back them up, those who frequently attend and are serious don't report infidelity cases"*.

He further stated that

> "*it was not easy for family or friends to forgive their partners who engage in extramarital sex for the sake of keeping the marriage stable, however, we advise them to do so and when the offender is committed to change, the marriage regains stability"*.

A clergy (CL-003) stated that

> "*I think we can also use examples of thriving couples within the church to speak to others and convince them that fidelity is possible*".

This agrees with Lau and Miles (2023) that Coupe role modeling can be used to foster unity and spousal commitment to each other thus avoidance of sex outside marriage.

Another church leader (ChL-009)in his words

> "*The society and church can advocate for emphasis of good morals and values instilled during premarital and post-marital counseling, seminars and training sessions for married people*".

In attempt to solve extra marital affairs church leaders and clergy reported that discipline and self-control was paramount, provision of teachings, guiding and counseling among victims, preaching of moral behavior, change in natural behavior and avoiding lust as well as myths regarding extra marital benefits could go a long way in ensuring stability in marriages. This supports assertions made by Robinson et al. (2018) that the church leadership has a significant role in ensuring marital stability through mentorship programs, intense outreach focused on healthy couple role modeling and welcoming access to counseling before and after marriage. Counselling therefore should be a continuous process and couples should show willingness and commitment to mentorship and further guidance.

4.1.3 Marital Stability

The researcher sought to assess marital stability of members of Anglican church of Butere, Kakamega County on a 5 Likert scale (where 1=Strongly Disagree (SD), 2=Disagree (D), 3= Neutral (N), 4=Agree (A), 5 = Strongly Agree (SA) was used in the analysis of data. The results of the Likert were shown in Table 4.

Table 4

Marital Stability

Description	N	SD (%)	D (%)	U (%)	A (%)	SA (%)
There exists a harmonious relationship between me and my spouse	324	64 (19.8)	28 (8.6)	36 (11.1)	84 (25.9)	112 (34.6)
There exist high communication levels between me and my spouse	324	56(17.3)	24 (7.4)	76 (23.5)	92 (28.4)	76 (23.5)
There exist high trust levels between me and my spouse	324	56 (17.3)	16 (4.9)	84 (25.9)	96 (29.6)	72 (22.2)
There are lower divorce chances between me and my spouse	324	0 (0)	8 (2.5)	108 (33.3)	168 (51.9)	40 (12.3)

Based on the study findings in table 4, 112 (34.6) strongly agreed that there existed a harmonious relationship between them and my spouses, 92(28.4%) agreed that there existed high communication levels between them and my spouses,96(29.6%) agreed that there existed high trust levels between them and their spouses, 168 (51.9%) agreed that there were lower divorce chances between them and their spouses. However, looking at responses for agreement it still indicated chances of low marital stability among respondents in Butere Anglican Diocese in Kakamega County, Kenya. The society needs to mold good men and women as the church should avail marital teaching to its members based on interview responses.

In an Interview session, a church leader(ChL-011) noted that

> "*I indeed give the best however marital stability has been taken as mere theory based on complaints received from married people especially young couples"*.

Lack of trust, harmony and communication threatened families to a tune of creating divorce in some of the most perceived strong families. A clergy(CL-005) from one of the churches indicated that "*ACK church has not initiated convincing mitigating measures in curbing EMS*".A study conducted in Kenya by Kioko (2015) in determining infidelity among 265 men and women who are married discovered gender-specific determinants of extramarital sex which affected marital stability. This is a monster eating both men and women in equal measure. The church therefore as the societal moral compass must stand out to improve and devise more vigorous measures to mitigate extramarital sex and specifically in the Anglican Diocese of Butere, Kakamega, Kenya.

The study avails relationship among study constructs where the extra marital sex is compared to marital stability in relation to the study.

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Table 5

Pearson Correlation Analysis

		Biblical theological teachings	Mitigating measures	Marital stability
Biblical theological teachings	Pearson Correlation	1	.306**	.334**
	Sig. (2-tailed)		.000	.000
	N	324	324	324
Mitigating measures	Pearson Correlation	.306**	1	.443**
	Sig. (2-tailed)	.000		.000
	N	324	324	324
Marital stability	Pearson Correlation	.334**	.443**	1
	Sig. (2-tailed)	.000	.000	
	N	324	324	324

Table 5 displays that bivariate correlation coefficients for all the study variables were significant at 5% level of significance (p-values < 0.05); that is, there existed a moderate positive correlation between Marital stabilityand Extra marital sexual relationship among married faithful of Anglican church in Butere Diocese Kakamega County, Kenya as indicated by; Biblical theological teachings (r = .334, p-value= 0.000 < 0.05); Mitigating measures (r = .443, p-value= 0.000 < 0.05). This study concluded that there existed moderate positive relationship between dependent variable (Marital stability) and independent variables (extra marital sexual relationships). This is further affirmed by Kavulavu *et al.* (2020) who said that lack of exposure to the biblical concepts of marriage and why God designed sex can be a significant reason for individuals to engage in extramarital sex with people outside marriage.

The study examined the regression model for extra marital sexual relationships influence on marital stability. The researcher pursued the testing of the following hypothesis (H01-H02: Table 6 summarizes the results.

Table 6

Multiple Linear Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.718[a]	.515	.503	.70367

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82.608	2	20.652	41.709	.000[b]
	Residual	77.738	157	.495		
	Total	322.346	323			

a. Dependent Variable: Marital stability

b. Predictors: (Constant), Biblical theological teachings, Mitigating measures

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.783	.488		-3.655	.000
	Biblical theological teachings	.255	.076	.202	3.331	.001
	Mitigating measures	.318	.142	.150	2.239	.027

a. Dependent Variable: Marital stability

The model managed to explain R of 0.718 and R Square 51.5% of the variation in the marital stability of Anglican faithful of Butere Diocese. The model gave R Square above 50% indicating the model was deemed fit to express extra marital sexual relationships and marital stability of Anglican faithful of Butere Diocese. Kwena *et al.* (2022) argue that even some of the people who are well-educated on Christian values still engage in extramarital sex, and it is not enough to teach about adhering to biblical teachings.

F =41.709, P = 0.000<0.05, as per to the ANOVA (Analysis of Variance) findings in table indicate of a strong match for dataset by the multiple linear regression model. The p value indicates a significant relationship between extra marital sexual relationships and marital stability. Meaning extra marital sexual relationships affected stability of marriages. Idoko (2018), in his study on the prevalence of extramarital sex among married women in Enugu, Nigeria, asserts that extramarital conduct emanating from a perilous lifestyle has been among the social problems affecting society today concurring with current study. From the discoveries the examination detected that all the variables were significant thus Biblical theological teachings (r = p-value= 0.001 < 0.05), Mitigating measures (p-value= 0.027 < 0.05).

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The null hypotheses $\mathbf{H_{01}}$-$\mathbf{H_{02}}$ were therefore rejected implying extra marital sexual relationship had a statistically significant influence on the marital stability of faithful married people in the Anglican Diocese of Butere, Kakamega County, Kenya. The regression model was as follows:

$Y = -1.783 + 0.255 X_1 + 0.318X_2$

Where: Y= Marital stability, X_1= Biblical theological teachings and, X_2= Mitigating measures

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

This study explored how extramarital sex affected marital stability in the Anglican Diocese of Butere and found some important predictors of infidelity to include emotional dissatisfaction, extended separations, and financial difficulties. Among others, the findings highlighted that counseling, family upbringing, and strict church policies could help reduce extramarital sexual behavior. The church leaders and the clergy insisted on constant guidance and counseling, emphasizing self-control and changes in moral behavior. Disciplinary action taken, for example, included demotion of members who engaged in extramarital relationships; this was also an effective way to control such behavior. Financial empowerment, especially for women, was considered a critical measure to reduce financial-driven infidelity.

This study concludes that even though many factors contribute to the prevalence of extramarital affairs, some focused interventions, such as Christian counseling, tight church policies, and moral teachings, can suppress these behaviors. Churches can help inculcate a culture of fidelity and self-discipline, thus contributing to more stable, fulfilling marriages. It calls for further research on the role of financial empowerment and geographic separation in promoting infidelity, including modern challenges such as digital communication contributing to extramarital affairs. Overall, spiritual guidance, policy enforcement, and economic support are needed to comprehensively address the issue.

5.2 Recommendations

Empowering Premarital and Marital Counseling: The Anglican Diocese of Butere churches should step up their premarital counseling programs to ensure that the couples understand the future implications of extramarital affairs. There should be continued marital counseling, especially on how to communicate, be faithful, and be emotionally present in marriages.

The promotion of the church's policy on discipline: The church should actually continue enforcing its policy regarding members and leadership engaging in extramarital relations with disciplinary action. With that, the church reinforces a culture of fidelity, promoting moral behavior.

Economic Empowerment of Women: Efforts must be made to empower women economically. As the findings of this study showed, low-income earning women are more prone to extramarital relationships. Financial education and opportunities for women can help reduce such vulnerability.

Enhanced Christian Teachings on Fidelity: The moral teachings should be constantly reiterated through homilies and even seminars that would instill self-discipline, self-control, and faithfulness in marriage. The leadership should also be adept at serving as models to show the way to marital fidelity.

These recommendations, if put in place, could actually bring down the incidence of extramarital sex and enhance marital stability in the region significantly.

REFERENCES

Anderson, G. (2008). The covenant of marriage: A biblical perspective. *Journal of Educational Research (ISSN: 2805-413X)*, *4*(05), 06-11

Atkins, D. C., Baucom, D. H., & Jacobson, N. S. (2001). Understanding infidelity: Correlates in a national random sample. *Journal of Family Psychology, 15*(4), 735–749. https://doi.org/10.1037/0893-3200.15.4.735

Aziz, A. (2021). Moral implications of extramarital affairs in modern society. *KIU Journal of Social Sciences*, *4*(1), 63-69

Baker, C. (2019). *Churc*h leadership and marital counseling: A Christian approach. *Journal of Family Psychology, 15(*4), 735

Barrat, J. (1965). The emotional toll of infidelity: A psychological view. *Zanco Journal of Humanity Sciences*, *25*(5), 340-347

Buthelezi, N. (2021). Anglicanism and the institution of marriage: Historical perspectives and current relevance. *Journal of Family Psychology*, *1* (2), 1-18

Dillow, C. A., Shafi'abadi, A., &Doukaneifard, F. (2013). *Sexuality and spirituality: Perspectives on marital intimacy*. *Journal of Qualitative Research in Health Sciences*, *8*(4), 16-27

Dollahite, D. C., & Lambert, N. M. (2007). Faith, religion, and marital fidelity: Church-based guidance for couples. *Family Relations, 56*(4), 423–436. https://doi.org/10.1111/j.1741-3729.2007.00471.x

Licensed Under Creative Commons Attribution (CC BY-NC)

Gary, T. (2015). Holy matrimony: Rethinking God's purpose for marriage. *The Qualitative Report, 23*(11), 2622-2633.
Ghoreishi, F. (2018). The societal perception of victims of infidelity. *Family process*, *59*(3), 956-966
Gordon, K., & Mitchell, M. (2020). COVID-19 and its effect on relationship stress and infidelity. *Journal of Marital & Family Therapy*, *46*(3), 456–470. https://doi.org/10.1111/jmft.12345
Hernandez-Kane, J. L., & Mahoney, A. (2018). The role of emotional involvement in extramarital relationships. *Journal of Family Psychology, 32*(1), 102–111. https://doi.org/10.1037/fam0000345
Hunt, S. (2013). Biblical stories and their implications for modern relationships. *Review of Religious Research*, pp.290-307.
Idoko, C. (2018). Factors influencing extramarital relationships in contemporary marriages. *The Family Journal*, *27*(1), 22-30
Karadzhy, O., & Tsurkan-Saifulina, Y. (2023). Coping behaviour of women in the situation when their partner cheated. Scientific Bulletin of Mukachevo State University. Series *"Pedagogy and Psychology", 9*(4), 18-26.
Kavulavu, E., *et al.* (2020). Biblical teachings and marital fidelity in Christian marriages. *The journal of sexual medicine*, *16*(8), 1155-1169
Kioko, J. M. (2015). Determinants of extramarital sex among married men and women in Kenya. [Master's Thesis, *Journal of Family Psychology*, *32*(4), 425.
Klassen, A. D., Williams, C. J., & Levitt, E. E. (1989). Sex and morality in the U.S.: Changes in attitudes and behavior. *Journal of Psychology & Human Sexuality, 2*(2), 83–96. https://doi.org/10.1300/J056v02n02_06
Kumar, R. (2023). The role of Christian counseling in marriage preparation and maintenance. *Gender and Behavior*, *17*(2), 13248-13267.
Kwena, B., *et al.* (2022). Christian values and the paradox of infidelity. *International Journal of Education and Research*, *10*(2), 1-16.
Lau, M., & Miles, J. (2023). Role modeling and church-based marital support systems. *Pedagogy and Psychology"*, *4*(9), 18-26.
Maddock, M. (2022). *Is there a relationship between religiosity and infidelity? A meta-analysis* (Master's thesis). Brigham Young University.
McKeever, T. (2020). Sexual exclusivity in monogamous marriage: Ethical and emotional perspectives. *Journal of African Interdisciplinary Studies*, *4*(2), 4-15.
Medeiros, L. (2023). Marital fidelity: The foundation of a lasting relationship. *Quarterly journal of social work*, *5*(4), 12-5
Morris, L. (1983). Biblical foundations of marriage. *Journal of Family Theory & Review*, *10*(1), 32-48.
Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and qualitative approaches*. Nairobi: ACTS Press.
Ndungu, M. (2017). *Infi*delity and reconciliation in contemporary marriages. *Journal of Social Behavior and Community Health*, *2*(1), 199-209.
Njiru, H., & Purkayastha, B. (2018). Sexual ethics and the Christian doctrine. *Journal of Religion and Health, 57*(2), 667–679. https://doi.org/10.1007/s10943-017-0435-3
Oladi, G., *et al.* (2016). Extramarital relations and their effect on marital satisfaction. *Journal of Family Studies*, *22*(1), 34–48. https://doi.org/10.1080/13229400.2015.1020987
Otubah, J. (2023). Sexual purity and modern youth: A Christian perspective. *Family Process*, *59*(3), 1308-1318
Oyetade, A. (2020). Biblical view of marriage: Insights from Hebrews. *A Journal of Analysis of Exploitation and Violence*, *8*(1), 7.
Robinson, L. C., *et al.* (2018). Church leadership, mentorship, and marital stability. *Journal of Family and Community Ministries*, *31*(1), 11–23.
Rokach, A., *et al.* (2023). The emotional effects of cuckoldry: A review. *Sexuality & Culture*, *27*(1), 1–19.
Sabatelli, R. M., *et al.* (2020). Infidelity and the erosion of marital foundations. *Journal of Social and Personal Relationships*, *37*(3), 683–701. https://doi.org/10.1177/0265407519882172
Sanger, M. (1926). *Happiness in marriage*. New York: Brentano's.
Scelza, B. A. (2024). *The evolution of female infidelity: A cross-cultural perspective*.
Silo, K. (2022). The role of Christian counseling in fidelity *Pacific Philosophical Quarterly*, *5*(3), 515-537.*maintenance*.
Sinha, A. (2020). Utilitarianism and morality in modern relationships. *The Journal of Latin American and Caribbean Anthropology*, *28*(2), 121-130.
Tuelo, L. (2019). Global perspectives on extramarital sex. *Contemporary clinical trials communications*, *9*, 23-32.
Van de Velde, H. (2013). The ideal marriage: Its physiology and technique. *Journal of Gender Studies*, 27(8), 957-968.
Yesmen, T., & Nahid, H. (2002). Socio-economic and religious factors in marital stability. *European Journal of Education Studies*, *7*(10), 34-35.

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Assessing the effectiveness of integrated information management system for managing land in Tanzania

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ABSTRACT

This study assesses the effectiveness of the Integrated Land Management Information System (ILMIS) in Tanzania, focusing on whether it has achieved its intended objectives based on stakeholders' perceptions. The Unified Theory of Acceptance and Use of Technology is used to assess the effectiveness of the system. A mixed methods approach is employed, using a convergent research design and stratified random sampling. The study is conducted in the Dar es Salaam City Council with the target population of 384. However, the study managed to collect data from 350 respondents, including land officers, surveyors, administrators, and community members. Data collection methods include structured questionnaires, interviews, and document reviews. Quantitative data are analyzed using descriptive and inferential statistics via SPSS, while qualitative data are examined through content analysis using Taguette software. The findings reveal that ILMIS significantly aligns with its intended goals in areas where it is fully implemented. Key achievements include the reduction of land disputes, improved accuracy of ownership records, and enhanced monitoring of illegal encroachments. The system has also improved service delivery by reducing transaction times and bureaucratic delays, thereby helping to curb corruption. Furthermore, ILMIS's integration with other government functions, such as tax administration, reflects adherence to global best practices in land governance. This study concludes that ILMIS has a positive impact on land administration in Tanzania. However, for sustained success, the system requires continuous upgrades, expanded user training, broader inclusivity, and integration with traditional land tenure systems. These measures are essential to ensure equitable and efficient land governance across both urban and rural areas.

Keywords: Assessment, Effectiveness, Information Management System, Land Management, Tanzania

I. INTRODUCTION

Globally, the adoption of digital information systems has significantly improved land administration particularly in developed Countries such as Singapore, Sweden and the United States through technologies such as GIS, Cadastral Systems and Blockchain registries (Coffie et al., 2024: Gong & He 2022). In developing countries, however initiative such as Indonesia's land Office computerization and Indian's DLRMP face persistent challenges including limited technical capacity and uneven implementation (Imanbayeva et al., 2024). Across Africa, digital land systems are promoted as solution to corruption and inefficiencies. Rwanda's Land Administration Information Management System (LAIS) for example has improved transparency and reduced land disputes while countries like Kenya and Nigeria continued to struggle due to poor internet access and governance issues (Coffie et al., 2024).

In Tanzania, the Integrated Land Management Information System was introduced to address the longstanding issues such as poor records keeping, lack of transparency and delays. Despite of improving processes in Urban areas like Dar es salaam, challenges such as low digital literacy, infrastructure gaps and limited staff capacity persist especially in rural regions (Mwaikambo & Hagai, 2023). Based on the theory assumptions, it was adopted to assess the effectiveness of information management system for managing land through ILMIS at Dar es salaam City Council. It is evident that the application of information management systems in land resource management has gained significant global attention. For instance, in Ghana Coffie et al. (2024) highlighted the potential of a well-structured Land Information System to improve land governance and administrative efficiency. Similar, Todorovski et al. (2021) assessed land administration in Ecuador using a fit-for-purpose approach, demonstrating improvements in transparency and data accuracy. On performance expectancy, the study examined whether ILMIS has met its intended objectives in improving land management. Metrics such as time taken for land registration, accuracy in ownership records, and revenue collection efficiency was analyzed. Stakeholder feedback was assessed whether ILMIS has delivered on expectations to reduce bureaucratic inefficiencies and land-related disputes.

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Effort expectancy evaluated the ease of use of ILMIS for its users. This includes both technical and non-technical staff at the Dar es Salaam City Council. The assessment involved examining the system's user interface, the level of training provided to staff, and the extent to which users find it intuitive to navigate and operate ILMIS effectively.

Social influence assessed how the attitudes and behaviors of the stakeholders which were Government officials, land management experts, surveyors and IT specialists, impact the adoption and use of the system. So, when influential individuals or groups either within the Ministry or those connected to the land sector actively promote the system that encouraged wider acceptance and usage. Aspects that have strong social support such as ease of use, integration with the existing processes and effectiveness in improving land management are more likely to be successfully implemented. Facilitating conditions assessed the support mechanisms available to sustain ILMIS. This includes evaluating the availability of reliable internet, system maintenance, adequate technical expertise and support, adequate financial support, management support, good governance and leadership practice, Good political will, obedience of ethical practices and stakeholders' honesty. Any gap in facilitating conditions was identified as critical barriers to the system's effectiveness.

This study firstly, will contribute to improving land administration by identifying how ILMIS enhances effectiveness in processes such as land registration, title deed issuance, and dispute resolution. Second, the study's findings will offer insightful information to stakeholders and policymakers in the land management sector, enabling them to improve policies and guarantee accountability and transparency in land transactions. Thirdly the study can draw attention to how ILMIS can help in addressing challenges like corruption, delays and inaccurate land record which are critical for accelerating economic growth and sustainable economic development. Finally, the study adds to the limited empirical research on the effectiveness of digital land management systems in developing countries, particularly in Sub-Saharan Africa and Tanzania specifically.

Based on literature reviewed, the study revealed that while the application of information management system in land resource management has been gaining significant attention globally, for instances with studies from Ghana, Ecuador, Kazakhstan, as well as other countries demonstrating its potential for improving land management efficiency, there still a noticeable gap in the research particularly addressing the efficiency of information management system in land management in Tanzania. In particular, the implementation of land management information systems (LMIS) in Tanzanian contexts, such as the ILMIS at Dar es Salaam City Council, is underexplored.

It was further revealed that, previous studies have been focusing on the applications of information management system, GIS, as well as other digital technologies in improving land governance including agricultural efficiency. These studies in most cases have been often emphasizing performance expectancy, effort expectancy, including facilitating conditions as key factors driving technology adoption. For example, a study in Kazakhstan (Imanbayeva et al., 2024) examined the role of IS in enhancing land resource management and agricultural decision-making, while Gong and He (2022) examined how Internet of Things [IoT] and GIS have been contributing to land resource management efficiency. However, these kinds of studies primarily concentrate on broader applications on specific sectors like agriculture or national governance systems. Thus, there was a need to explore the specific dynamics of information management system adoption in Tanzanian land management systems. Figure 1 presents the conceptual framework of the study.

1.1 Statement of the Problem

Land administration in Tanzania has a long struggled with fragmentation manual process and limited integration of spatial and alphabetic data. Before Integrated Land Management Information System there were Systems such as MOLIS, LRMIS and SRS operated in isolation with cadastral maps managed manual and unliked to digital records. This segmentation led to inefficient workflows, delayed title issuance often taking up to six months and heightened risks of fraud or tempered documents (Kironde, 2009). In Dar es salaam, rapid urbanization and informal settlements exacerbate these challenges making land disputes and tenure insecurity more common in the absence of timely, transparent and land records. These content underscores the urgent need for a more integrated, reliable and secure land information infrastructure.

Integrated Land Management Information System was introduced in July, 2018 as a pilot initiative in Dar es salaam specifically in Kinondoni and Ubungo Districts to digitalize and consolidate cadastral maps, records, workflows and integrate with national systems like NIDA and GEPG (IGN FI, 2018). While ILMIS has improved access to land information, reduced costs and increased system user satisfaction including over 50% of land landholders in Kinondoni reporting improved services awareness remains incomplete with nearly 40% still unaware of the system's existence (Ntongani, 2024). Implementation obstacles including gaps in ICT infrastructure, insufficient training and institutional inertia continue to undermine ILMIS's full potential (Mollel et al., 2023).

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Although government made some initiatives such as staff training programs, investment in digital infrastructure and public awareness campaigns to improve the system. But these initiatives produced inconsistent results. Experience from developed countries demonstrate that information management system solutions can significantly transform land management when implemented effectively (Mollel et al., 2023). This study assessed the effectiveness of Integrated Land Management Information System in managing land in Tanzania using Dar es salaam City Council as a case study.

1.2 Research Objective

This study identified the key objectives that was intended to be addressed and assess the aspects that have been fully met by ILMIS in Tanzania.

1.3 Research Question

The study seeks to answer, what were the key issues that ILMIS was designed to address and which aspect of ILMIS have been successfully implemented.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Unified Theory of Acceptance and Use of Technology (UTAUT)

This study applied Unified Theory of Acceptance and Use of Technology (UTAUT) to access the effectiveness of the Integrated Land Management Information System (ILMIS) in Dar es salaam. The theory was developed by Venkatesh et al. (2003) and it is widely recognized model used to explain and predict individuals' acceptance and usage of technology. This model synthesizes elements from the Theory of Reasoned Action (TRA) and the Technology Acceptance Model (TAM) providing a comprehensive framework for analyzing user behavior regarding new technological systems. According to UTAUT four primary constructs influences user acceptance and usage of behavior namely; Performance expectance, Effort expectance, social influence and Facilitating conditions. Performance expectancy evaluated whether ILMIS has improved land management, effort expectance examined ease of use, training and user interface, social influence assessed how key stakeholders shape system adoption and facilitating conditions focused on infrastructure, technological support, governance and ethical practices.

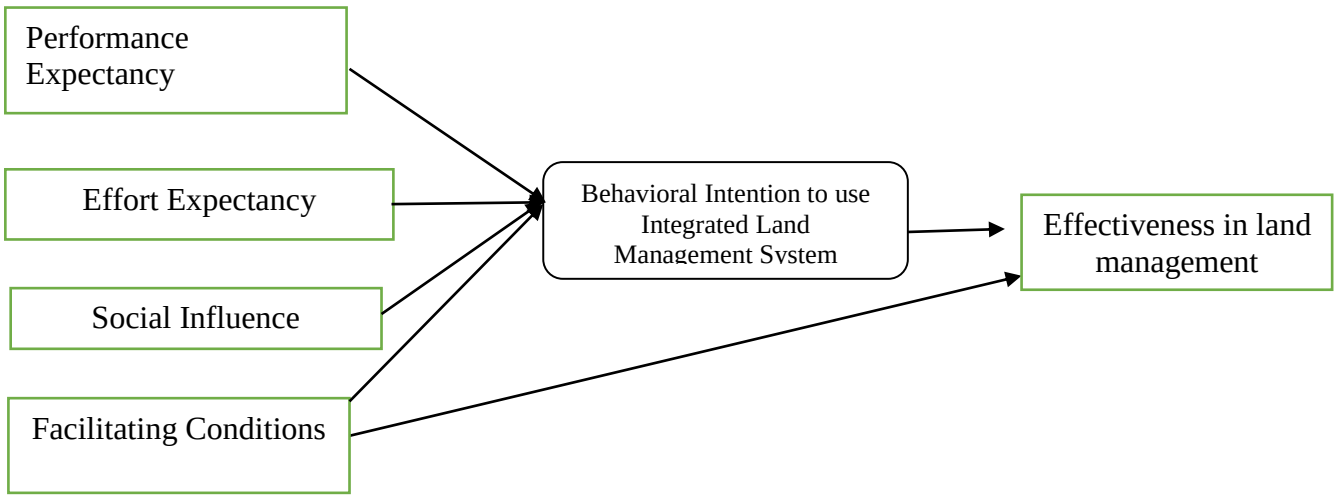

Figure 1
The UTAUT Model
Source: The UTAUT Model (Adapted from Venkatesh et al. (2003))

2.2 Empirical Review

Several studies have explored the role of Information and Communication Technology (ICT) in land management though with varying focus areas and limitations regarding the Tanzanian context. Pacurucu et al. (2022) conducted a study in Ecuador on the role of modern ICT tools in facilitating public participation in land management. The findings emphasized the need for ICT platforms that bridge communication between Citizens and and experts to promotr participatory decision making. However, the study did not assess how such tools could be adapted for engaging Tanzanian Citizens within frameworks like ILMIS. Recent study by Djawa. (2023) investigated the impact of ICT on land transportation services in Indonesia. While insightful, the study did not explore the application of ICT

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in land resource management particularly in the context of developing countries. This highlites a research gap concerning the use of ICT systems like ILMIS in enhancing land resource management and service delivery in Cities like Dar es salaam.

Study by Imanbayeva et al. (2024) in Kazakhstan examined the integration of Information systems into agricultural land resource management. Their study highlighted the importance of collaboration between government and private sectors to overcome implementation challenges. Despite its relevance, the study did not address the unique context and challenges of Tanzania particularly those faced by ILMIS at the Dar es salaam City Council. In similar vein, Coffie et al. (2024) in Ghana studied land governance and underscored the value of strong Land Information Systems in enhancing transparency, decentralization and legal frameworks. Their findings offer valuable insights for Tanzanian authorities on strengthening ILMIS by adopting similar strategies and frameworks.

Lastly, Petrakovska et al. (2024) analyzed the interoperability of state information systems in Ukraine's land management sector. The study emphasized the importance of open data and effective data sharing mechanisms. While informative, it did not address the specific integration challenges of various ICT systems within the environment of ILMIS in Tanzania.

III. METHODOLOGY

3.1 Research Design

In this study pragmatism philosophy was applied. The philosophy is focuses on the practical implications of research and emphasizes the use of mixed methods to address real-world problems effectively (Prasad, 2021). This approach allowed for the combination of qualitative and quantitative data to evaluate ILMIS comprehensively, focusing on its intended objectives, achievements, and areas requiring improvement. By using qualitative methods, data was collected through in-depth interviews with land officers, land developers, city council staff and ILMIS system implementers, the research captured insights into the original objectives of ILMIS and the problems it aimed to address. It reveals user experiences, system usability, and areas of satisfaction.

In addition, the design allowed the application of quantitative analysis so as to identify the strength as well as the significance of relationships (Kothari, 2014) between the key issues that ILMIS was intended to address and the aspect have been fully met. Using insights from both qualitative and quantitative data, the study identified gaps in ILMIS, such as system downtime, limited user training, or challenges in integrating ILMIS with other government systems.

3.2 Population of the Study

Population of this study includes members of the public who use ILMIS for land related services, surveyors, land officers, IT specialists like system administrators and employees of the Ministry of land, Housing and Human Settlements Development who use ILMIS. The study was conducted in Dar es salaam where the demand for efficient land management has been high because of the population growth, rapid urbanization, as well as increased land transactions.

3.3 Sample Size

In order to guarantee the representativeness a combination of purposive and a stratified random sampling techniques was used to choose the study's sample size. Since the sample size was unknown, the study employed Cochran's formula ($n = Z^2\ p\ (1-p)]/e^2$) to calculate sample size Where: n = required sample size; Z = Z-score corresponding to the desired confidence level (e.g., 1.96 for 95%); p = Estimated proportion of the population with the characteristic of interest (assume 50% = 0.5 if unknown, as it maximizes sample size); while e = Desired margin of error (e.g., 0.05 for 5%). The required sample size was approximately 384 respondents. However, the study managed to collect data from 350 respondents.

3.4 Sampling Technique

The research included a mix of random and purposive sampling technique. Randomized chance sampling guaranteed that the majority was adequately represented, while purposeful sample focused on the important respondents who had specific expertise and experience in land management processes as well as information systems including surveyors, Town planners, land Officers, IT Personnel managing ILMIS and key decision makers at the Dar es salaam City Council. This strategy reduces selection bias and encourages varied representation, which strengthens the validity of research findings (Saunders et al., 2019).

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3.5 Data and Data Collection Methods

Semi structured interviews and structured questionnaires served as the data collection methods to gather primary data and document review for secondary data. Although semi structured interview allowed for a more thorough analysis of important topics and provided insightful qualitative information. Structured questionnaires produced quantitative data on respondents' perceptions. Triangulation data using several approaches improves the study's validity and offers a more thorough grasp of the research goals, as stated by Cresswell and Plano Clark. (2018).

3.6 Data Analysis

The goals of the study were met by generating both descriptive and inferential statistics through the use of SPSS software for data analysis. Both basic and complex datasets can be effectively analyzed through SPSS, which is renowned for its adaptability (Pallant, 2020). Taguette software was used to examine and code interview transcripts in order to find recurrent themes and patterns in qualitative data. This enhanced the content of the qualitative findings.

3.7 Ethical Consideration

All participants were informed about the goals of the study and sign consent forms. In terms of confidentiality, all responses were kept confidential ensuring ethical handling of data.

IV. FINDINGS & DISCUSSION

4.1 Demographic Information of the Respondents

Table 1 Demographic information of the respondents where the sample size of the study was 350 respectively.

Table 1

Demographic Characteristics of the Respondents(N=350)

Gender	**Frequency**	**Percent**
Male	180	51.4
Female	170	48.6
Age Group	**Frequency**	**Percent**
18-24	50	14.3
25-34	120	34.3
35-44	80	22.9
45-54	70	20.0
55+	30	8.6
Level of Education	**Frequency**	**Percent**
Secondary School/Diploma	60	17.1
Bachelor's Degree	200	57.1
Master's Degree	90	25.7

Out of 350 respondents 180 (51.4%) were male and 170 (48.6%). This implies that both genders were fairly represented in the study, allowing for a comprehensive understanding of the research topic across gender lines.

In terms of age group, the highest percentage of respondents (34.3%) is between the ages of 25 and 34, followed by those between the ages of 35 and 44 (22.9%). This age group inclusion suggests that the survey was successful in capturing perspectives from people who are probably in the early to middle stages of their professional or personal development. The 45 to 54 age group had a lower percentage of responders (20.0%), while the 18 to 24 and 55+ age groups had the lowest representation (14.3% and 8.6%) respectively. According to this age distribution younger people and those in the middle career stages are more likely to be interested with the subject matter of the study compared to the older age groups who are underrepresented.

Based on educational background, majority of respondents (57.1%) held a bachelor's degree, (25.7%) master's degree and a lesser percentage (17.1%) had a diploma or completed high school. This implies that people with higher education, especially those with a bachelor's degree make up the majority of the study population. This may indicate that educated people are more aware of or interested in the research topic.

Generally, the demographics of the study sample indicate that the findings are probably representative of a middle aged, somewhat male and reasonably well-educated group of people. These characteristics should be considered when generalizing the findings of the study, as they may not fully capture the views of younger, older, or less-educated populations.

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4.2 Key Issues that ILMIS was Intended to Address

To identify the key issues that ILMIS was intended to address, semi-structured interviews were employed to provide in-depth qualitative insights. Key stakeholders, such as senior officials from the Ministry of Lands, IT specialists, land management experts, and selected ILMIS users, were interviewed.

Land Tenure Security and Dispute Reduction: During the interview with Land Officer – Ministry of Lands, Housing and Human Settlements Development, when asked on the key issues that ILMIS intended to address he has this to say;

> *"One of the biggest key issues that ILMIS was intended to be addressed, overlapping land claims and disputes. This is because people used to come in with overlapping claims, especially in urban and peri-urban areas. Therefore, ILMIS was introduced for improvement in how land ownership is documented".*

The interviewee responses suggest that while ILMIS has made important strides in addressing key land issues, particularly tenure security, dispute resolution, and encroachment prevention, its effectiveness is currently limited by coverage, digital infrastructure, and implementation gaps, especially in rural and remote areas. The findings concur with Imanbayeva et al. (2024), who emphasized that computerized land registration systems reduce land conflicts and overlapping claims by enhancing the transparency and clarity of land ownership records. Similarly, Gong and He (2022) observed that secure land tenure and reduced land disputes are among the key benefits realized from implementing digital land information management systems across Sub-Saharan Africa, though these benefits are often uneven due to poor infrastructure and limited coverage. The study also interviewed the District Land Survey Officer on key issues that ILMIS was intended to address. His response was as follows;

> *"ILMIS was introduced to help in preventing land encroachments, especially in areas where the system is fully functional. However, where the data has not been fully digitized, the risk of illegal occupation remains high."*

The findings suggest that users generally agree ILMIS is achieving its intended goals, but not strongly. This implies that expectations have not been fully met due to factors like incomplete digitization, lack of real-time updates, insufficient training for users, and weak integration with environmental and legal enforcement systems. Furthermore, Coffie et al. (2024) argued that systems like that can significantly contribute to improved land governance and conflict resolution.

Data Integration and System Modernization: Moreover, during the interviewee with one of the Land Officer – from the Ministry of Lands, when asked on the key issues that ILMIS intended to address he has this to say; he has this to say.

> *"Before ILMIS, we relied heavily on paper-based records, which were often incomplete or hard to trace. The system has been introduced to keep land records through digitized, since it was expected to be easier to locate parcel details during service delivery."*

These responses suggest that ILMIS has been used to make progress in solving major challenges that once made land management difficult in Tanzania. They indicate that ILMIS is seen as effective especially in joining different functions of land administration which are thought to be important for better planning and coordination. They also show the usefulness of ILMIS in dealing with longstanding problems like inefficiency and difficulty in accessing land records. Additionally, these responses indicates that people generally believe ILMIS is effective in integrating land administration functions. This is inline with the findings of the study by Petrakosvka et al., (2024) and Pacurucu et al., (2022) who say that digitizing and integrating land administration systems improves transparency, access to records and how well the system works. During the interview with one among the ICT specialists from the implementation team when asked about what ILMIS aimed to achieve, they said:

> *"ILMIS has been introduced to make a significant progress in integrating land administration, registration, and surveying. The idea was to enabled more cohesive decision-making and better tracking of land parcels.*

Their response points out that combining land administration, registration and surveying are the key focus of ILMIS. These tasks previously were handled separately leading to problems in managing land effectively and poor communication. This means by developing a centralized and interoperable system, ILMIS aims to promote coordinated decision making. This could improve the accuracy of records, expedite provision of service and reduce duplication. This is in line with Djawa.(2023), who found that integrated land information systems can enable seamless workflows and reduce redundancies. Moreover, During the interview with Survey Officer when asked about the main objectives that ILMIS was aimed to solve. The interviewee responded as follows:

> *"ILMIS aimed to address the issue of Integration with other government databases like tax or municipal planning but these functionalities are still minimal"*

This response implies that, limited integration with other government databases was a persistent challenge that ILMIS aimed to achieve.

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The implication of this response is that limited integration with other government databases, such as tax systems and municipal planning was a persistent challenge that ILMIS intended to address. This implies that, without that integration, land data remains underutilized in critical policy areas such as revenue collection, urban planning and infrastructure development. ILMIS is thus intended to solve as a foundation for cross – sectional data sharing enabling more informed public sector planning and policy implementation. This statement reveals that cross-agency integration remains a challenge, even though it was one of ILMIS's intended goals. This is consistent with findings by Ryazantsev and Belik (2024): and Song (2022), who identified that land information systems in developing countries often face hurdles in integrating with other public sector databases due to institutional silos and lack of interoperability standards. In addition, during the interviewee with one of the Regional Land Administrators, when asked on the key issues that ILMIS intended to address he has this to say; he has this to say.

> *"One of the major issues intended to be addressed was the need for improvements and standardizing how land data is recorded. Previously, each region had different formats and codes.*

The response suggests that the previous lack of standardized formats and codes across regions implies that ILMIS was designed to harmonize and unify land data recording practices nationwide. The implication is that inconsistencies in data formats and terminologies across regions previously led to confusion, legal ambiguities, and inefficiencies in land transactions. ILMIS is expected to introduce uniform procedures, thereby increasing trust, reducing disputes, and improving data reliability for decision-making at both local and national levels.

The response indicates that ILMIS was designed to harmonize and standardize land data recording practices across regions. Previously, discrepancies in formats and coding led to confusion and legal ambiguities. This concern resonates with Xue (2023), who highlight that lack of standardization in land record systems can create barriers to land transactions and legal enforcement.

Accessibility and Transparency: During the interview with one of the Land Officers, when asked on the key issues that ILMIS intended to address he has this to say; he has this to say.

> *"Previously, there was a difficultness in accessing land records, the process was manual that made people to travel to find land Offices and sometimes waiting for some days for a response. That was one among the key issues that ILMIS was intended to address. On top of that, ownership data must be swiftly retrieved and shared digitally with clients. The goal was to avoid Office traffic while at the same time increasing internal efficiency."*

This provide information on the main issues that ILMIS was designed to address. Before the introduction of ILMIS, one of the biggest challenges was time consuming process of obtaining land records. The Land Officer clarified that people had to visit land Offices physically and wait many days to get information they required. This not only complicated things but also led to busy Offices and poor service provision. ILMIS was introduced to change this situation and make land records digital so that management and clients could get data faster and digitally. These changes improved efficiency in Office operations and also made the experience better for customers by reducing overcrowding and delays. These results concur with what Pacurucu et al. (2021) found that, highlighting how land information systems can improve access and efficiency by replacing old paper-based methods with digital tools especially in sub–Saharan Africa. Also Gong and He. (2022) found that, digitalizing land records helped improve access and transparency in Rwanda. Additionally, during an interview with one among the survey Officer, when asked on the main concerns that ILMIS was aimed to solve, the respondent said:

> *"Previously, people would file complaints and never heard back. But now the system tracks and logs issues and responses are faster and more traceable. So, requirement for the speed of responses pertaining to land related queries was one among the major issues that intended to be addressed by ILMIS."*

Results shows that ILMIS improves responsiveness and accountability. Previously before introduction of ILMIS many complaints remained unsolved because of the absence of effective system. ILMIS enabled complaints to be recorded, tracked and addressed promptly and transparently. This ability improved service provision and enhanced public confidence in the land administration systems. By doing so, ILMIS fosters accountability in land governance bodies. These results match the findings of Imanbayeva et al. (2024), who claims that traceable, digitalized systems enhance transparency and reduce corruption in land management. Also, Coffie et al. (2024), highlight that ICT based land systems greatly boost accountability by facilitating complaint tracking and enabling citizen feedback.

The implication of these results is that, the enhancement of responsiveness and accountability through ILMIS before its implementation, land related complaints and queries were unsolved due to lack of proper tracking systems. Therefore, ILMIS enabled complaints to be logged, monitored and responded in timely and traceable manner. This functionality ensured faster service provision and builds public trust in the land administration system. By simplifying complaint resolution procedures and making service provision transparent, ILMIs promotes accountability within land governance institutions. This is in line with Imanbayeva et al. (2024), who argued that traceable and digitalized system

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promote transparency and reduce corruption in land governance. Also, Coffie et al. (2024) noted that ICT based land systems significantly improve accountability by enabling complaint tracking and citizen feedback mechanisms.

Moreover, during the interviewee with one of the District Land Administrators, when asked on the key issues that ILMIS intended to address he has this to say; he has this to say.

> *"The need for receiving periodic updates through ILMIS including the need for the updates that are communicated more widely especially in rural areas where people may not have regular internet access."*

The findings point out the need for regular updates and effective communication, particularly in rural areas where internet connectivity is limited. This indicates that ILMIS was also intended to improve communication channels and ensure that information is disseminated more equitably across different regions. The implication here is that while ILMIS has made significant strides in digitization and service improvement, there is still a pressing need to develop outreach strategies that can bridge the digital divide. This could include using mobile platforms, local media and community engagement to ensure that rural populations are not left behind in the transition to digital land management. This view aligns with Petrakovska et al. (2024), who note that digital land systems must be inclusive, especially in low-connectivity areas.

4.2.1 The aspects that have been fully met through ILMIS

Land tenure security and dispute reduction: Table 2 shows the results from the assessment of the integrated Land Management Information System in Tanzania suggests that the system has been notably effective in achieving its internal goals particularly in the areas of land tenure security and dispute reduction and efficiency and service delivery. The mean scores that range between 3.80 and 3.95 indicate that participants were strongly agree with positive contributions of ILMIS in land tenure security and dispute resolution.

Additionally, the mean score of 3.90 on encroachment prevention demonstrates that ILMIS has proved success in overseeing and protecting land from illegal or unauthorized occupation particularly in areas such as road reserves, wetlands and forests. The mean score for enhanced land tenure security implies a notable advancement in legal recognition and protection of land rights which remains essential for both individual and combined land owners. These findings shows that ILMIS contributed a lot in building trust in the land administration system by reducing conflicts and establishing more secure and systematic land management structure. These reinforce the perspective presented by Djawa (2023), who observed that land information system plays a vital role in regulating unlawful land usage and ensuring the preservation of environmentally vulnerable areas. This aligns with Ryazantsev and Belik (2024): who stressed that secure land tenure is a cornerstone for sustainable development and that modern land administration systems can facilitate such security.

Table 2 An analysis of the study under the theme of Land tenure security and dispute reduction.

Table 2

Land Tenure Security and Dispute Reduction

Statements	Mean	Std. Dev.
To increase land tenure security	3.82	1.139
To reduce land-related disputes by improving data accuracy and transparency	3.95	1.025
To prevent land encroachment	3.90	1.181
To prevent encroachments on wetlands, forests, road reserves and other public land	3.80	1.210

4.2.2.2 Efficiency and Service Delivery

Table 3 shows the results in terms of efficiency and service delivery, the results are even more encouraging with mean scores ranging from 3.83 to 4.10. The highest score (4.10) reflects respondents' strong agreement that ILMIS has reduced the time needed to check, update and transfer land highlighting its role in operational efficiency. Additionally, score of 4.07 and 3.97 for the delivery of secure and reliable land services and for streamlining land ownership verification and responsive public services. The public's confidence in the land administration system, measured at a mean of 3.90, has evidently mean been strengthened through ILMIS likely due to its transparency and consistency in service delivery. These results concur with Song (2022) who assertion that information system has improved efficiency by reducing time in land transaction processes and enhancing transparency aligns with Xue (2023) argument that digitized land administration systems can significantly increase transparency, reduce transaction times, and curb corruption in land governance in African countries.

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Table 3

Efficiency and Service Delivery

Statements	Mean	Std. Dev.
To improve public confidence in the land administration system	3.90	1.045
To reduce the time required to check, update and transfer land	4.10	.861
To provide affordable, secure and reliable land administration services to the customers	4.07	1.083
To streamline land ownership verification and title deed issuance	3.97	1.174
To reduce corruption associated with checks, registration and transfer of titles	3.83	1.094

Moreover, the mean score of 3.83 reflects the impact of the system on reducing corruption. The digitalization and automation have reduced the possibility of human intervention in land transactions there by avoiding chances or opportunities for fraudulent practices. Generally, these results shows that ILMIS has achieved what was expected to be done especially in the area of transparency, timely deliverance of land related services and building trust. The fact is that, stakeholders appreciated the system and agreed that ILMIS is working smoothly in handling land issues in the public sector of Tanzania. These findings match the Papaskiri et al. (2021), who argued about the needing proper and transparent systems to tackle poor and corrupt land transactions that are done behind the scenes.

With the mean scores ranging from 3.83 to 4.10 the efficiency and service delivery results are even more encouraging. The respondents' strong agreed that ILMIS has reduced the time needed to verify, update and transfer land and it is reflected in the highest score (4.10) underscoring the contribution of the system to increased operational efficiency. As evidenced by the mean scores of 4.07 and 3.97, the system has led in more responsive and accessible public services for provision of safe and dependable land related services for simplifying the verification of land ownership and title issue respectively. The public trust in the land administration system has clearly increased as a result of ILMIS, most likely as a result of its consistency and transparency in providing services. These findings match with what Imanbayeva et al. (2024) who argued that strong land governance systems are essential for better service delivery, less corruption and greater public trust.

Additionally, the mean score of 3.83 demonstrate the ability of the system to minimize corruption. This means by digitalizing and automating processes has minimized the requirement for human interaction in land related transactions which therefore reduced the opportunity for fraudulent practices. These results match Imanbayeva et al. (2024) who revealed operational benefits of land management information system.

Data Integration and System Modernization: Results in Table 4 show the results of Data integration and System Modernization. Here the mean scores range from 3.83 to 4.20 indicate that people strongly agree that ILMIS has helped improve the land administration system. The high score of 4.20 means that ILMIS has made land management processes more efficient which increase coordination and improve decision making. The mean score of 4.15 shows that people agree with ILMIS has made data sharing between government agencies complete and more connected. These findings are in line with what Imanbayeva et al. (2024), concluded about how sharing data between agencies is important for reducing duplication and improving services.

The mean score of 3.90 demonstrates the capability of the system to transform land records and maps into digital formats. This shows effectiveness in modernization efforts transitioning from manual to digital processes enhancing efficiency and reducing the risk of tempering or data loss. A mean score of 4.00 highlights the ILMIS's ability to keep data accurate and up to date which is crucial for dependable and timely land administration services. The findings match Gong and He (2022), who emphasized that real time access and data accuracy are crucial for reliable land governance systems. On top of that, indicates that although there is a chance for improvement, the process has been made in fostering consistency and minimizing data fragmentation. This is supported by Coffie et al. (2024), who argued that standardized land information should be fundamental outcome of any effective land governance system.

Table 4

Data Integration and System Modernization

Statements	Mean	Std. Dev.
To support the process of transforming land records and maps into digital formats	3.90	1.115
To integrate land administration, land registration and surveying for better planning and decision making	4.20	.782
To integrate land records with other government databases for better planning and decision-making	4.15	.990
To ensure real-time updates across digital land systems	4.00	1.142
To standardize land data formats for consistency across agencies	3.83	1.117

Accessibility and Transparency: The mean score of 3.87 in table 5 reflect the agreement by the respondents that ILMIS has improved access to land information for both government agencies and the public. The ability to view

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land records online was particularly managed, this is evidenced by a high mean score of 4.03 which shows the successful implementation of services that enable users to get land data without requiring to visit land Offices. This enhances both transparency and convenience for land owners and other stakeholders. These findings align with those of Petrakovska et al. (2024), who highlighted the transformative impact of digital land systems in fostering transparency and simplifying bureaucratic land access.

The mean scores for improving the user interface and language options (3.80) providing timely responses to land related inquiries (3.75) and regularly updating the public on land policy changes (3.77) suggest that ILMIS has made significant progress towards delivering inclusive and responsive services. Although these scores are slightly lower, they still indicate a general consensus that ILMIS has improved communication and public engagement. Overall, these findings suggest that ILMIS has successfully achieved several key objectives especially in digitalizing land data, integrating systems for improved coordination and increasing the accessibility and transparency of land information thereby boosting trust, accountability and efficiency in land management in Tanzania. These results aligns with the recommendations of Pacurucu et al. (2022), who support the use of national electronic land registries to decrease land conflicts, stimulate investment and ensure fair access to land.

Table 5

Accessibility and Transparency

Statements	Mean	Std. Dev.
To enhance accessibility to land information for both government agencies and the public	3.87	1.101
To enable online access to land ownership records	4.03	.936
To improve user interface and language options for inclusive access	3.80	1.210
To provide timely responses to land-related queries	3.75	1.201
To standardize land data formats for consistency across agencies	3.77	1.108

4.3 Inferential Statistics Analysis Results

The One-Sample t-test was run so as to determine whether there is a significant difference between the key issues that ILMIS was intended to address and the aspects that have actually been fully met. Through comparing the average responses from stakeholders (such as land officers, surveyors, and administrators) to a set benchmark or expected outcome, the test shows if the system's implementation has met expectations or if gaps still exist. The findings are presented in table 4.6 below that shows the results of the one-sample t-test.

Table 6

One-Sample t-test

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Intended	82.827	359	.000	3.86750	3.7757	3.9593
Fully Met	84.982	359	.000	3.92594	3.8351	4.0168

Table 6 indicates the results of the One-Sample t-test reveal important implications regarding the perception of stakeholders on the effectiveness of the ILMIS. Both sets of variables—key issues that ILMIS was intended to address (mean = 3.8675) and the aspects that have been fully met (mean = 3.9259) have statistically significant t-values (82.827 and 84.982, respectively) with p-values of .000. These results indicate that respondents significantly agreed with the items listed under both categories, meaning they acknowledged the relevance of the issues ILMIS was meant to solve and recognized that several of those issues have indeed been addressed.

Furthermore, the mean value for the aspects fully met (3.93) is slightly higher than that for the intended issues (3.87), suggesting a positive perception toward the performance of ILMIS. This could imply that, from the respondents' perspective, ILMIS may have not only achieved its objectives but potentially exceeded initial expectations in certain areas. However, it is important to note that this slight increase does not necessarily establish a statistically significant difference between the two categories since the One-Sample t-test assesses each mean against a test value (often 0), not against each other.

To determine whether there is a significant difference between the key issues ILMIS was intended to address and the aspects that have been fully met, a Paired Sample t-test would be more appropriate, given that both sets of data likely come from the same respondents. If such a test was conducted and the result showed a p-value less than 0.05, it would indicate a statistically significant difference between perceived intentions and actual achievements. In such a

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case, a positive mean difference would suggest ILMIS has outperformed expectations, while a negative one would point to a gap between intended outcomes and what has actually been achieved.

In conclusion, despite of current findings to show high agreement on the intended goals and achievements of ILMIS, the slightly higher mean for the achievements reflects a generally favorable view of impact of the system. However, a direct comparison using a paired sample t-test was needed to determine if this difference is statistically significant and make stronger conclusion about the effectiveness of ILMIS in achieving its goals. This method is in line with the research by Djawa (2023) and matches to statistical principles described by Ryazantsev and Belik. (2024). Still, involving other evaluation criteria from comprehensive system assessment frameworks and conducting effect size analysis would further strengthen the reliability of results.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Generally, the assessment of Integrated Land Management Information System indicates that the system has significantly enhanced land management thereby increasing efficiency, data management and transparency. Its implementation enabled the digitalization and centralization of land records leading to improved service provision and reduced chances of corruption. Nonetheless, the study also highlighted significant performance issues, such as infrastructure support, limited interoperability with other systems and challenges in technical capacity.

To fully unlock the potential of ILMIS, Ongoing investment in system improvements, capacity development and stakeholder involvement is necessary. Addressing issues of data accuracy, user training and public awareness will be critical to strengthening trust and adoption. Moreover, integrating ILMIS with broader land-use planning and governance frameworks will ensure it becomes a more inclusive and sustainable tool for land management in Tanzania. A more responsive and robust ILMIS can significantly contribute to secure land tenure and long-term socio-economic development.

5.2 Recommendations

The Government should address persistent challenges like poor internet connectivity, limited access to computers in rural offices and frequent power outages that hinder the effective use of the Integrated Land Management Information System. Also, the fully met aspects (e.g., Secure digital land records, quicker processing of land titles, improved transparency) should be maintained and replicated in other regions of Tanzania.

Furthermore, the Government should develop resilient backup and Cybersecurity strategies and implement data redundancy (Offline backups), disaster recovery plans and safeguards against performance issues under load. Additionally, a secure strong institutional frameworks and leadership continuity. i.e., Ensure dedicated budget lines for the Integrated Land Management System; strengthen governance to withstand leadership changes; train project management in change and leadership dynamics as similarly recommended in Kenya's NLIMS caseIPRJBRepository.maseno.ac.ke.

It is advised to bridge formal Integrated Information Management Information Management System with traditional or customary systems, Dialogue with customary landholders, document and include their rights in the system and develop hybrid approaches allowing recognition of informal tenure. Nonetheless, regular performance evaluations and user satisfaction surveys to ensure that the system continue to meet its intended goals should be established.

It is the responsibility of the Government to ensure that, the system is integrated with other systems such as municipal planning tools in order to improve efficiency and data consistency across sectors. Also, the implementation of ILMIS should be expanded from Dar es salaam and Dodoma to additional regions through a phased approach that incorporates technical assistance, infrastructure enhancement and staff training. Lastly, many key issues stem from lack of understanding or awareness among stakeholders (Land Officers, System users etc.) therefore, regular training and awareness campaigns should be conducted to ensure that all users understand the purpose and capabilities of the Integrated Information Management Information System.

REFERENCES

Coffie, P. B., Osei, J. D., Boamah, E. O., Abindaw, T., & Jiru, T. L. (2024). Building an efficient land information system in Ghana: Insights from land governance. *Journal of Energy Engineering and Thermodynamics, 4*(3), 37–50. https://doi.org/10.55529/jeet.43.37.50

Cresswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage Publications.

Licensed Under Creative Commons Attribution (CC BY-NC)

Djawa, S. (2023). The impact of information & communication technology on land transportation service business in Indonesia (Case study in Central Sulawesi Province). *Journal of Social Research, 2*(5), 22–66.

Gong, H., & He, C. (2022). Intelligent management of land resources based on Internet of Things and GIS technology. *Journal of Sensors, 5*(4), 1–13.

IGN FI. (2018, July 16). Tanzania: ILMIS go-live. IGN FI.

Imanbayeva, Z., Mussirov, G., Nurgaliyeva, A., Rakhimov, T., Akhmetova, G., Kaldybayeva, D., & Petrov, A. (2024). Enhancing agricultural efficiency and land resource management through information systems. *Qubahan Academic Journal, 4*(2), 33–76.

Kironde, J. M. L. (2009, March). Improving land sector governance in Africa: The case of Tanzania. Paper presented at the Workshop on "Land Governance in Support of the MDGs", Washington, DC.

Kothari, C. R. (2014). *Research methodology: Methods and techniques* (3rd ed.). New Age International.

Mollel, H., Mbise, E., & Kalufya, M. (2023). Evaluating the effectiveness of land use plans in peri-urban areas of Arusha. *Tanzanian Journal of Land and Development, 7*(1), 88–102.

Mwaikambo, A., & Hagai, J. (2023). Urban planning challenges in rapidly growing African cities. *Journal of African Urban Studies, 12*(3), 45–60.

Ntongani, D. (2024). Land tenure reforms and urban development in Tanzania. Dar es Salaam Institute of Land Policy Research.

Pacurucu, N., Vivanco, L., Orellana-Alvear, B., & Ordoñez, [Initial?]. (2022). New information and communication technologies for public participation in Ecuadorian land management: Case study Cuenca. *AHFE*

Pallant, J. (2020). *SPSS survival manual* (7th ed.). McGraw-Hill Education.

Papaskiri, T., Burov, M., Ananicheva, E., Shevchuk, A., & Popova, E. (2021). Information and technological support of digital land management. *IOP Conference Series: Earth and Environmental Science, 867*, 012174.

Petrakovska, O., Mykhalova, M., & Lizunova, A. (2024). Interrelation of state information systems for land management. *Journal of Water and Land Development, 4*(150), 1–9.

Prasad, M. (2021). Pragmatism as problem solving. *Socius: Sociological Research for a Dynamic World, 7*(4), 1–13.

Ryazantsev, I., & Belik, M. (2024). Enhancing the efficiency of land resource management. *Research of Economic and Financial Problems, 2*(7), 7–13.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (9th ed.). Pearson Education.

Song, Q. (2022). Design and application of land resource management system based on Internet of Things. *Wireless Communications and Mobile Computing, 2022*, 1–10.

Todorovski, D., Salazar, R., & Jacome, G. (2021). Assessment of land administration in Ecuador based on the fit-for-purpose approach. *Land, 10*(8), 862. https://doi.org/10.3390/land/10080862

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Xue, H. (2023). Application of "3S" technology in land resource management. *Highlights in Science, Engineering and Technology, 69*, 241–245.

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Empirical insights into ICT use and knowledge management in accounting: A PRISMA-guided literature review (2020–2025)

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ABSTRACT

This Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)-informed scoping review examines the integration of Information and Communication Technology ('ICT') use and knowledge management (KM) practices in accounting for the period 2020-2025. Guided by the Technology Acceptance Model (TAM) and Knowledge Management (KM) theory, based on 41 empirical studies, the review explores ICT practitioner tools that have been implemented in practice and provides an overview of barriers to implementation effectiveness as well as solutions for enhanced adoption against the empirical setting. Results reveal a widespread use of tools, such as the accounting software, cloud-based platforms, and digital reporting systems for efficiency and improvement in reporting quality. Knowledge creation, dissemination, and application are key KM practices that underlie decision-making and organizational learning. This is mainly due to lack of infrastructure, unskilled staff in ICT, and ineffective policies. Recommended recommendations focus on specific training, leadership engagement, and the adoption of KM models. The results of ICT-based KM are increased efficiency, transparency, and financial returns. Yet, notable gaps exist, particularly with respect to cohort studies and context-specific information in Africa. This paper highlights a gap in the literature and the importance of further research on how new technologies interplay with accounting practice, as well as structural and human-capacity constraints.

Keywords: Accounting, Barriers, ICT, Knowledge Management, PRISMA, Strategies

I. INTRODUCTION

Modern accounting profession has gone global with the central role of Information and Communication Technology (ICT) together with a knowledge-based practice. Information Communication Technology (ICT) tools such as accounting software, cloud computing systems and digital reporting platforms facilitate improved efficiency, accuracy and decision-making in organizations (Noordin et al., 2024; Thottoli, 2021; Jackson & Allen, 2024). Similarly, KM process contributes to the capturing, sharing and applying organizational knowledge to see that important financial perspective is well applied in driving performance (Paoloni et al., 2020; Bresciani et al., 2023; Al-Dmour et al., 2023).

Evidence reveals that the adoption of ICT has a positive effect on accounting output across different environments. For instance, cloud accounting enhances quality of financial information in the UAE firms (Noordin et al., 2024) and efficiency gains for SMEs in Nigeria Ghana is found from ICT- supported accounting practices (Osaloni et al., 2023; Adjei et al., 2021). Novel technologies (and particularly generational AI) are having an impact on accounting tasks and decision-making (Dalvi-Esfahani et al., 2025; Al-Okaily, 2025). Nonetheless, lack of adequate infrastructure, poor ICT literacy, resistance to technological change and low organizational support remain some of the challenges that can prevent effective adoption especially in developing countries (Hamad et al., 2021; Lubua, 2022; Thottoli & Ahmed, 2022).

Knowledge management is also added to ICT by documenting and sharing financial, organizational knowledge in a systematic process. Empirical research in African and Middle Eastern countries reveals that proper KM strategies improve transparency, accountability, and general performance (Krah & Mertens, 2023; Salem et al., 2021; Vendrell-Herrero et al., 2020). Furthermore, the integration of ICT and KM is important also for implementation of innovation, sustainability and strategic planning in accounting (Broccardo et al., 2025; Birt et al., 2023; Grossi et al., 2020). Despite the advantages, some gaps emerged such as lacking longitudinal samples, frameworks for ICT-KM integration that are underdeveloped and little focus upon emerging technologies in accounting practices (Dalvi-Esfahani et al., 2025; Vărzaru, 2022; Lubua 2020).

The present review, done under the guidance of PRISMA method, synthesizes empirical studies that were published from 2020 to the year 2025 in order to report about the adoption of ICT and KM practices in accounting. It describes the principal inhibitors, approaches for successful realization and impact of ICT-based knowledge shared in both global and African contexts.

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1.1 Statement of the Problem

Despite their recognised importance for accounting practice, Information and Communication Technology (ICT) and Knowledge Management (KM) have not been applied consistently as drivers of modern accounting practice; especially in developing countries". While ICT resources are capable of improving the efficiency, accuracy of reporting, and decision-making process, their meaningful utilization is sometimes constrained by lack of infrastructure, low ICT literacy level among staff, negative organizational attitudes towards technology use (Hamad et al., 2021; Lubua, 2022; Thottoli & Ahmed 2022).

Similarly, KM practices—essential to capture, share and apply institutional knowledge—are not sufficiently incorporated in accounting systems. A culture of weak knowledge sharing, unsupportive institutional policies, and the misalignment between ICT systems and KM frameworks are still impeding on the complete potential benefits of KM within accounting (Krah & Mertens, 2023; Salem et al., 2021; Vendrell-Herrero et al., 2020). Although some evidences are found in the literature that contributes to requirement aspects of ICT or KM, it is arguable that there is a significant guidance on barriers, enablers and benefits of ICT-enabled knowledge management (KM) in accounting. Such synthesis is particularly required to facilitate progress in transparency, accountability and performance in accounting organisations such those located in the Global South. (Noordin; et al., 2024; Osaloni: et al., 2023; Adjei: et al., 2021).

1.2 Research Objectives

i. To identify and evaluate real-life studies (2020-2025) conducted on ICT application and knowledge management in accounting.
ii. To summarise the main barriers and strategies for effective ICT and KM implementation in Accountancy.
iii. To highlight the outcomes and benefits associated with ICT-enabled KM practices in accounting.
iv. To identify research gaps and propose directions for future studies, particularly in African contexts.

II. LITERATURE REVIEW

2.1 Theoretical Review

This review is informed by two complementary theoretical frameworks: the Technology Acceptance Model (TAM) and Knowledge Management (KM) theories, specifically, Nonaka and Takeuchi SECI model. Taken together, these models present an integrated understanding of how ICT adoption and KM practices interact to facilitate accounting tasks. The Technology Acceptance Model (TAM) proposed by Davis (1989) proposes that technology adoption and use are mostly driven by two perceptions: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In accounting environments, these opinions will shape the use of technologies including online accounting software, cloud applications and electronic reporting solutions. Technologies that are perceived as useful in terms of enhancing job performance and ease-of-use are more likely to be adopted. TAM therefore presents a useful theoretical framework for exploring ICT adoption behaviours in accounting contexts.

Aligning with TAM, the Knowledge Management (KM) theories, especially the SECI model proposed by Nonaka and Takeuchi (1995), also emphasize on complex dynamics of knowledge generation and use. SECI model describes four knowledge-converting activities: Socialization (sharing tacit knowledge through personal contacts), Externalization (articulating tacit knowledge into explicit concepts), Combination (systemizing and combining of converted concepts in a systematic manner) and Internalization (embedding converted concepts into routines). These activities are important in accounting, where both explicit (as documented procedures) and tacit (as professional judgment) knowledge is key. Through fusing TAM and the SECI model, this review uses a dual perspective to investigate how the use of technological tools and knowledge flows jointly affect accounting practices. Such integration helps to describe not only what leads or impedes the ICT and KM adoption, but also how such challenges are addressed and with what results. It underpins a conceptual discussion of obstacles, facilitators and benefits relating to the use of ICT in knowledge management in accounting.

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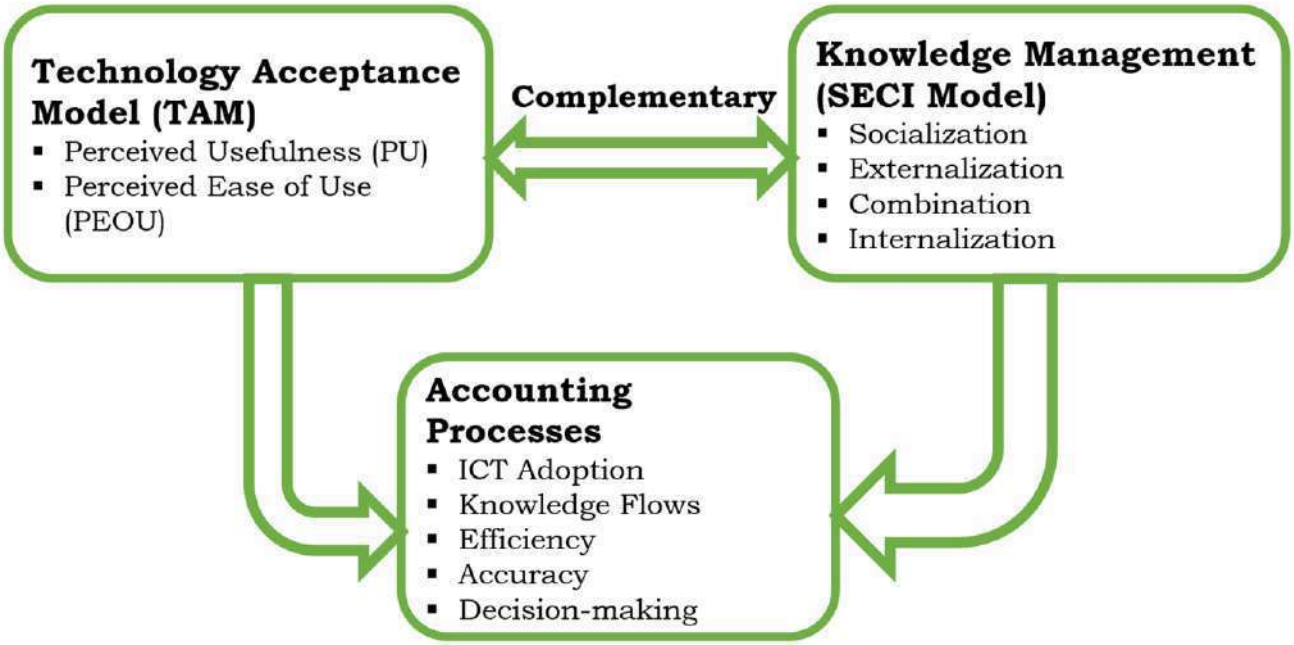

Figure 1
Theoretical Framework integrating TAM and SECI Model
Source: Author's construct (2025).

Figure 1, depicts the conceptual framework underlying this review. The Technology Acceptance Model (TAM) has identified other conceptual drivers namely perceived usefulness and perceived ease of use to influence ICT adoption in accounting environments. Meanwhile, the process of knowledge creation and the conversion of knowledge is expounded by SECI model in Knowledge Management (KM) theory from four aspects: socialization, externalization, combination and internalization. The two-headed arrow between TAM and SECI reflects the complementary relationship between the technology appropriation and knowledge transfer. Both views intersect around accounting practices, and the role that ICT enhanced knowledge management plays in enhancing efficiency, precision and decision making of the profession.

2.2 Empirical Review

2.2.1 ICT Use and Knowledge Management in Accounting

Impact of adoption and use of ICT in accounting Empirical evidence Several empirical studies carried out from 2020 to 2025 investigated the acceptance and utilisation of ICT in accounting with respect to knowledge management system practices. For example, Noordin et al. (2024) also studied cloud accounting adoption in the UAE companies and they concluded that it significantly enhances financial information quality and hence reflects how ICT adoption practically influences the accounting practices. Likewise, Thottoli (2021) explored accounting software adoption in Oman showing that ICT literacy significantly influences adoption and highlighting human factors as essential to gauge a successful technology implementation. Jackson and Allen (2024) empirically examined the effect of staff perceptions and organisational contexts in accounting firms, finding that both personal characteristic and organisation atmosphere impact on technology adoption. In Nigeria, Osaloni et al. (2023) observed that ICT implementation improves business efficiency and decision-making, while Adjei et al. (2021) found that the institutions play an important role in cloud computing adoption by SMEs in Ghana. Future technology, e.g. generative AI: Virk et al., also analysed possible future technologies (such as transfer learning and grid search) alongside those included in their study. The personality characteristics of decision-makers would moderate their intention to innovate. Souza and Gasparetto (2020) explore how the organizational innovation dimensions affect the adoption of modern management accounting practices Taken together, these studies highlight that ICT utilization in the field of accounting is a result of a combination of technological, human, and organizational elements which are summarized in table 1.

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Table 1

Summary of Reviewed Empirical Studies on ICT Use and Knowledge Management in Accounting (2020–2025)

Author(s), Year	Study Focus	Methodology	Key Findings	Relevance to Objective 1
Noordin et al., 2024	Use of Cloud Accounting among UAE companies	Survey	Cloud accounting enhances the quality of financial information	Demonstrates ICT uptake improves efficiency of accounting.
Thottoli, 2021	Knowledge of the accounting and software also in Oman	Survey	ICT literacy affects adoption.	Foregrounds human factors in the adoption of ICT-KM.
Jackson & Allen, 2024	Technology adoption in accounting	Mixed-methods	Staff beliefs & environment shape uptake	Critical factors in ICT uptake: accounting industry
Osaloni et al., 2023	ICT adoption in Nigerian SMEs	Survey	ICT improves efficiency and decision-making	Provides African context evidence
Adjei et al., 2021	Cloud computing adoption in Ghana	Survey	Institutional factors shape adoption	African evidence for ICT-KM adoption
Dalvi-Esfahani et al., 2025	Adoption of AI Generative for entry jobs	Survey & modeling	Personality traits moderate technology adoption	Influence of ICT tools on the accounting function
Al-Okaily, 2025	Accounting analytics adoption	analytics adoption Survey	Positive attitudes improve ICT adoption	Shows impact of digital transformation
Thottoli & Ahmed, 2022	ICT and E-accounting in SMEs	Survey	IT adoption affected by several antecedents	Highlights technological and organizational factors
Ubesie & Erhimu, 2024	ICT impact on accounting standards in Nigeria	Empirical	ICT enhances accounting processes	African context evidence

2.2.2 Barriers, Challenges, and Strategies for ICT-KM Adoption

Some obstacles and opportunities exist to adoption of useful ICT and knowledge management in accounting. Lubua (2022) examined ICT uptake in African companies, and underscored infrastructure deficiency, policy gaps and manpower shortage as insurmountable impediments. Hamad et al. (2021), indicated that business owners do save operating costs with accounting software, but lack of training and experience with the digital tools impact their effectiveness. Also, Daff (2021) findings showed that employers do not consider graduates ICT competencies up to work requirements implying problems in human resource readiness. Adoption issues are also explained through the Technology Acceptance Model (TAM); see Qader et al. (2022), perceived usefulness and ease-of-use have a substantial impact on accounting software utilization. Adoption can also be constrained by contextual factors, such as rural–urban disparities, which was pointed out by Zheng and Ma (2022). Taken together, these studies highlight the various challenges faced by accounting firms, that will have to be managed through deliberate practices, as proposed in Table 2.

Table 2

Reported Barriers and Strategies for ICT-Enabled Knowledge Management Adoption in Accounting

Author(s), Year	Study Focus	Methodology	Key Findings	Relevance to Objective 2
Lubua, 2022	Determination of drivers for ICT adoption in Africa	Literature review	Adoption is impacted by infrastructure, policy and human resource requirements	Highlights barriers to ICT-KM adoption
Hamad et al., 2021	Accounting software to minimize costs	Survey	Software reduces operational costs	Shows challenges in effective utilization
Daff, 2021	Employers' perspectives on accounting graduates	Survey	Work readiness ICT skills	Human resource gaps as barriers
Qader et al., 2022	TAM outcomes for accounting software	Empirical	perceived usefulness & ease-of-use	Technology adoption barriers explained
Zheng & Ma, 2022	Impact of ICT penetration to Chinese population	Empirical	Urban-rural differences affect adoption	Contextual barriers for ICT utilization

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2.2.3 Outcomes and Benefits of ICT-enabled KM Practices

By reviewing available empirical evidence, this study also affirms the contribution of ICT-enabled KM activities in improving accounting efficiency, transparency and decision-making processes. ICT and KM adoption enhances the financial transparency and trust in sub-Saharan African local governments. Broccardo et al. (2025) have highlighted that the link between KM and management accounting is conducive to sustainability policies and eco-friendly practices, whereas Bresciani et al. (2023) found that integration of environmental management accounting with KM enhances organizational performance. Paoloni et al. (2020) emphasized that successful KM could facilitate innovation and intellectual capital making overall productivity betterment. Alvarenga et al. (2020), digital transformation as well as ICT-based KM led to performance enhancement in the public organisation. Additionally, Murthy et al. (2023) demonstrated that there are increasing returns to the industry product knowledge in the auditing market. Taken together, these results indicate that ICT-based KM delivers the good for accounting consequences, as summarised in Table 3.

Table 3

Summary of Reported Outcomes and Benefits of ICT-Enabled KM Practices in Accounting

Author(s), Year	Study Focus	Methodology	Key Findings	Relevance to Objective 3
Krah & Mertens, 2023	Financial transparency & accountability	Survey	ICT and KM enable transparency and trust	Shows KM improves accounting outcomes
Broccardo et al., 2025	KM and sustainability accounting in management	Review	KM enhances environmentally friendly practices	ICT-KM integration for strategic accounting
Bresciani et al., 2023	Environmental management accounting & KM	Survey	KM mediates performance outcomes	Shows KM processes enhance performance
Paoloni et al., 2020	KM, intellectual capital, entrepreneurship	Literature review	KM enhances innovation and knowledge propagation	Demonstrates benefits of KM practices
Alvarenga et al., 2020	Digital transformation & KM in government	Literature review	ICT-enabled KM improves organizational performance	ICT-KM benefits in public accounting
Murthy et al., 2023	Audit efficiency and system homogeneity	Empirical	Knowledge spillover improves audit efficiency	KM enhances accounting operations

2.2.4 Research Gaps and Directions for Future Studies

However, there are still some research nouns that could provide future contributions to our understanding of the impact of both ICT and KM in accounting. Indicating the scarcity of empirical research on MA and that there is need for regionally based studies in Africa (Ndemewah & Hiebl, 2022). Vendrell-Herrero et al. (2020): KM competence positively facilitates productivity, however robustness in the findings varies by circumstance and needs to be further inquired. Durst et al. (2024) found that there were knowledge gaps when it comes to SMEs and their uptake of the ICT-KM, as well as suggestions for further research. Vărzaru (2022) highlighted the AI application in managerial accounting to be unexplored, especially in developing countries. In addition, Rashid et al. (2021) also suggested longitudinal studies investigating the implementation of SAA and the influence of ICT-driven KM over time. Overall, these studies share opportunities for future research for the African accounting context in common.

Table 4

Identified Research Gaps and Suggested Future Research Directions in ICT and KM Studies (2020–2025)

Author(s), Year	Study Focus	Methodology	Key Findings	Relevance to Objective 4
Ndemewah & Hiebl, 2022	Management accounting research in Africa	Literature review	Limited empirical studies	Cons points out the gaps in African accounting contexts
Vendrell-Herrero et al., 2020	KM capabilities and productivity in Africa	Survey	KM enhances productivity though context dependent gaps prevail	Need for localized evidence
Durst et al., 2024	KM within SMEs: emerging trends and prospects	Systematic review	Future research Research to understand ICT-KM adoption	Identifies research opportunities
Vărzaru, 2022	AI acceptance in managerial accounting	Empirical	Accounting specific -AI adoption further research needed	Emerging ICT adoption gaps
Md. Mamunur Rashid et al., 2021	Strategic management accounting practices	Literature review	ICT-KM enhances decision-making; longitudinal gaps	What this paper adds Points to research in strategy

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2.5 Discussion and Research Gaps

The findings of the reviewed studies show that ICT increases accounting efficiency, decision-making and reporting quality, while KM practices guarantee knowledge capture and sharing. Yet obstacles still exist especially in developing countries like weak infrastructure, training and policy gaps. There are also gaps reported in the literature, such as lack of few longitudinal studies, absence of enough use of emerging technology and rare evidence with context specificity evidence about Africa (Dalvi-Esfahani et al., 2025; Vărzaru, 2022; Lubua, 2022). Closing these gaps is critical to better leveraging ICT-supported KM adoption in accounting.

III. METHODOLOGY

3.1 Search Strategy and Study Selection

This PRISMA-related study was conducted following a systematic search in various academic databases such as Google Scholar, Scopus, and Web of Science to identify empirical studies from 2020 to 2025. Literature search was concentrated in the areas of ICT adoption, knowledge management (KM), and accounting practices. Search terms were "ICT adoption accounting," "knowledge management accounting" and "ICT knowledge management accounting Africa." The selection criteria were applied to retrieve empirical studies published in English on and after 2020 that are potentially of interest to accounting practice. Exclusion criteria were not empirical and opinion papers and studies outside the area of accounting.

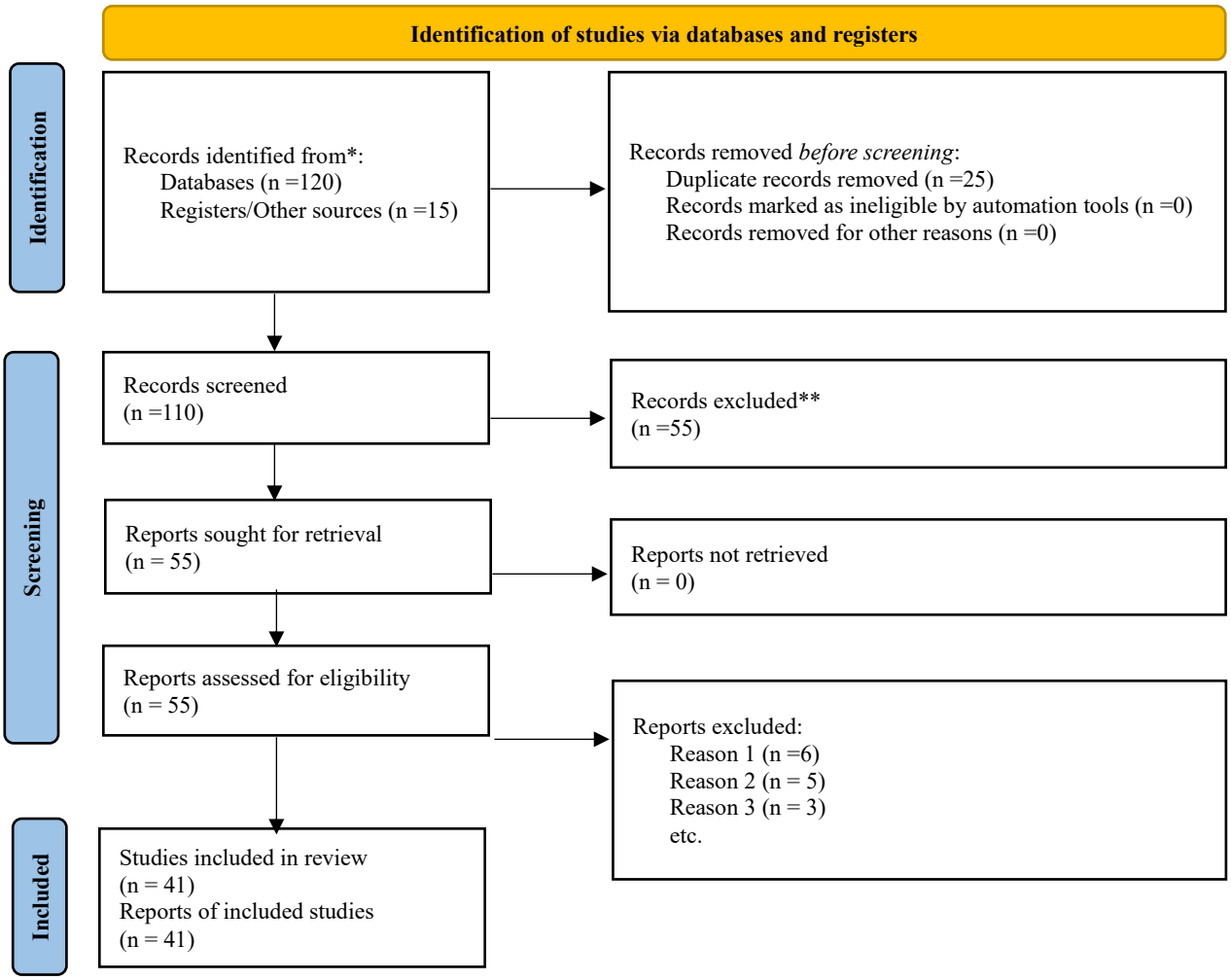

Figure 2

PRISMA 2020 flow diagram showing the selection process of empirical studies on ICT use and knowledge management in accounting (2020–2025). Numbers indicate records identified, screened, excluded, and included at each stage of the review.

Source: Page MJ, et al. BMJ 2021;372: n71. doi: 10.1136/bmj.n71.

3.2 Data Extraction and Synthesis

Information about all retrieved articles including first author, year of publication, county, methodology type, focus and main findings were extracted from each study reviewed as well as relevance to the review objectives. A

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narrative synthesis method was employed to compile findings according to the four main objectives (empirical studies on ICT and KM in accounting, barriers for the adoption of ICT and KM, outcomes and benefits, remaining research gaps)

IV. FINDING & DISCUSSION

4.1 Empirical Studies on ICT Use and Knowledge Management in Accounting (2020–2025)

In total, 41 empirical studies were included in the review. Commonly documented ICT based tools like accounting software, cloud-based technologies and digitalized reporting systems obviously improve financial management and reporting efficiency (Thottoli & Ahmed, 2022; Osaloni et al., 2023; Jackson & Allen, 2024). The KM also serve to complement the ICT adoption through knowledge creation, sharing and application that supports decision making, auditing and organizational learning (Kareem et al., 2021; Broccardo et al., 2025; Bresciani et al., 2023).

Table 5

Frequency of ICT Tools and KM Practices Reported in Reviewed Accounting Studies (2020–2025)

ICT Tool / KM Practice	No. of Studies Reporting	References
Accounting software	12	Thottoli & Ahmed, 2022; Jackson & Allen, 2024; Murthy et al., 2023
Cloud-based platforms	10	Osaloni et al., 2023; Broccardo et al., 2025
Digital reporting systems	8	Jackson & Allen, 2024; Osaloni et al., 2023
Knowledge creation	15	Kareem et al., 2021; Broccardo et al., 2025
Knowledge sharing	12	Bresciani et al., 2023; Kareem et al., 2021
Knowledge application	10	Kareem et al., 2021; Broccardo et al., 2025

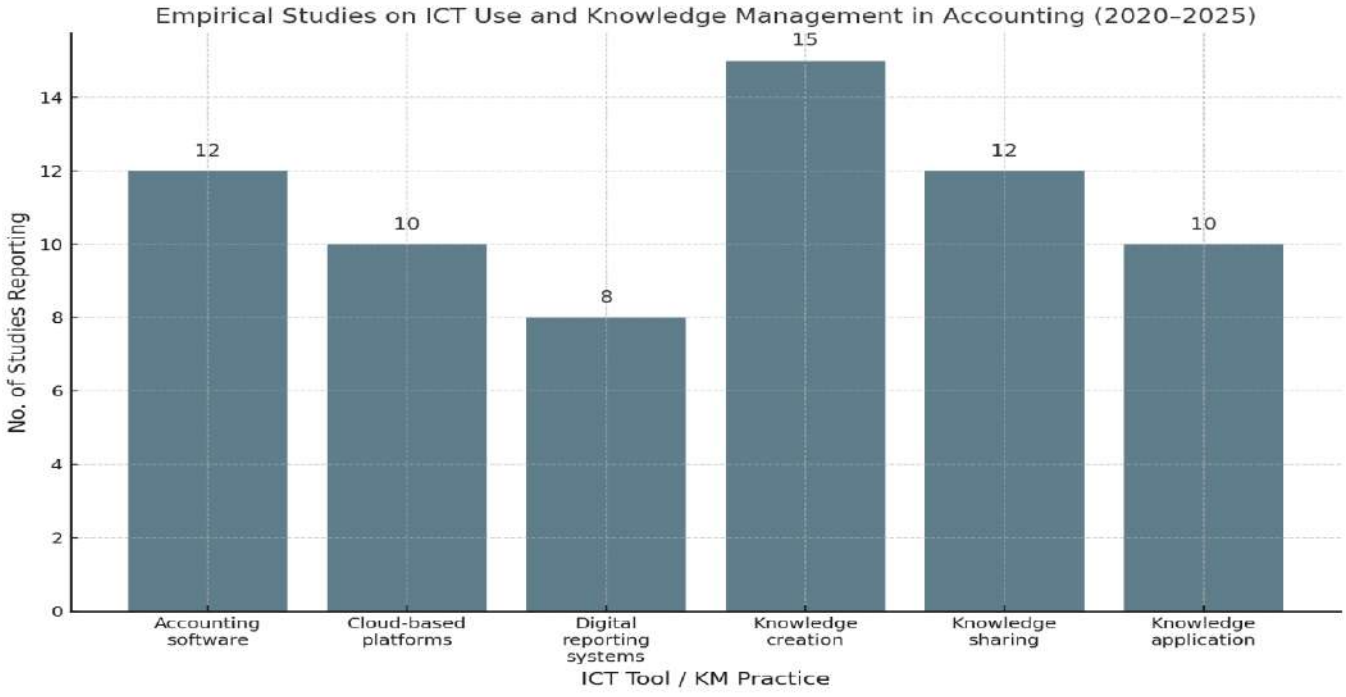

Figure 3

Bar Chart Showing Frequency of ICT Tools and KM Practices in Accounting Studies (2020–2025)

Figure 1 shows that knowledge creation (15 studies) and accounting software (12 studies) were the most frequently reported elements. The visual complements Table 5 by highlighting usage patterns across the reviewed literature.

4.2 Barriers, Challenges, and Strategies

A number of obstacles to the adoption of ICT-enabled KM were citied, including a lack of ICT infrastructure, low professional staff ICT skills, inadequate training, change resistance and weak policy support (Lubua, 2022; Vărzaru, 2022). thottoli,2024; Kareem et al., 2021) Complete success Involve strategic training, commitment of leaderships to the service, improved technology and incorporate framework KM in accounting processr (Al-Okaily, 2025; Thottoli, 2024; Kareem et al., 2021).

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Table 6

Summary of Barriers to ICT-Enabled KM Adoption and Strategies Suggested in Reviewed Studies

Category	Specific Barrier / Strategy	No. of Studies Reporting	References
Barriers	Inadequate ICT infrastructure	12	Lubua, 2022
	Limited staff ICT skills	10	Vărzaru, 2022; Thottoli, 2024
	Insufficient training	8	Al-Okaily, 2025; Kareem et al., 2021
	Resistance to change	7	Lubua, 2022
	Weak policy support	6	Vărzaru, 2022; Al-Okaily, 2025
Strategies	Targeted training	11	Al-Okaily, 2025; Thottoli, 2024
	Leadership commitment	9	Kareem et al., 2021; Lubua, 2022
	Technology upgrades	8	Thottoli, 2024
	Integration of KM frameworks	7	Kareem et al., 2021; Vărzaru, 2022

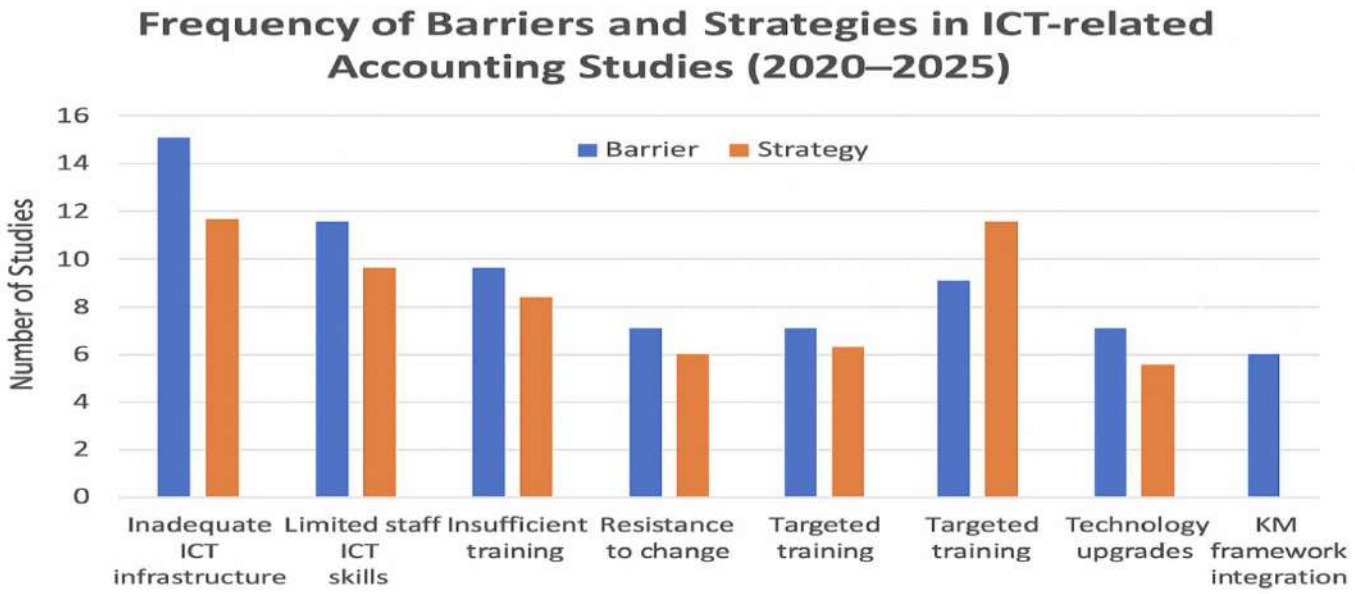

Figure 4

Bar Chart of Barriers and Strategies Reported in Reviewed Studies (2020–2025)

The number of studies that mentioned crucial barriers, such as lack of infrastructure and poor ICT skills and, by contrast most common strategies enabling for overcoming the same (e.g. training, support by leadership) is illustrated in Fig 2. Data match the entries summarized in Table 6.

4.3 Outcomes and Benefits of ICT-Enabled KM Practices

Integration of ICT-KM allows for a better accountability efficiency, reporting excellence, timely decision making as well as knowledge retention (Murthy et al., 2023; Paoloni et al., 2020; Aljarallah, 2020). Other advantages are enhanced transparency, accountability and financial performance (Mediaty et al., 2025).

Table 7

Reported Outcomes and Benefits of ICT-Enabled Knowledge Management Practices in Accounting

Outcome / Benefit	No. of Studies Reporting	References
Enhanced accounting efficiency	15	Murthy et al., 2023; Paoloni et al., 2020
Improved reporting quality	12	Aljarallah, 2020; Murthy et al., 2023
Faster decision-making	10	Paoloni et al., 2020; Aljarallah, 2020
Better knowledge retention	8	Murthy et al., 2023; Paoloni et al., 2020
Improved transparency	6	Paoloni et al., 2023
Enhanced accountability	5	Mediaty et al., 2025
Better financial performance	4	Mediaty et al., 2025

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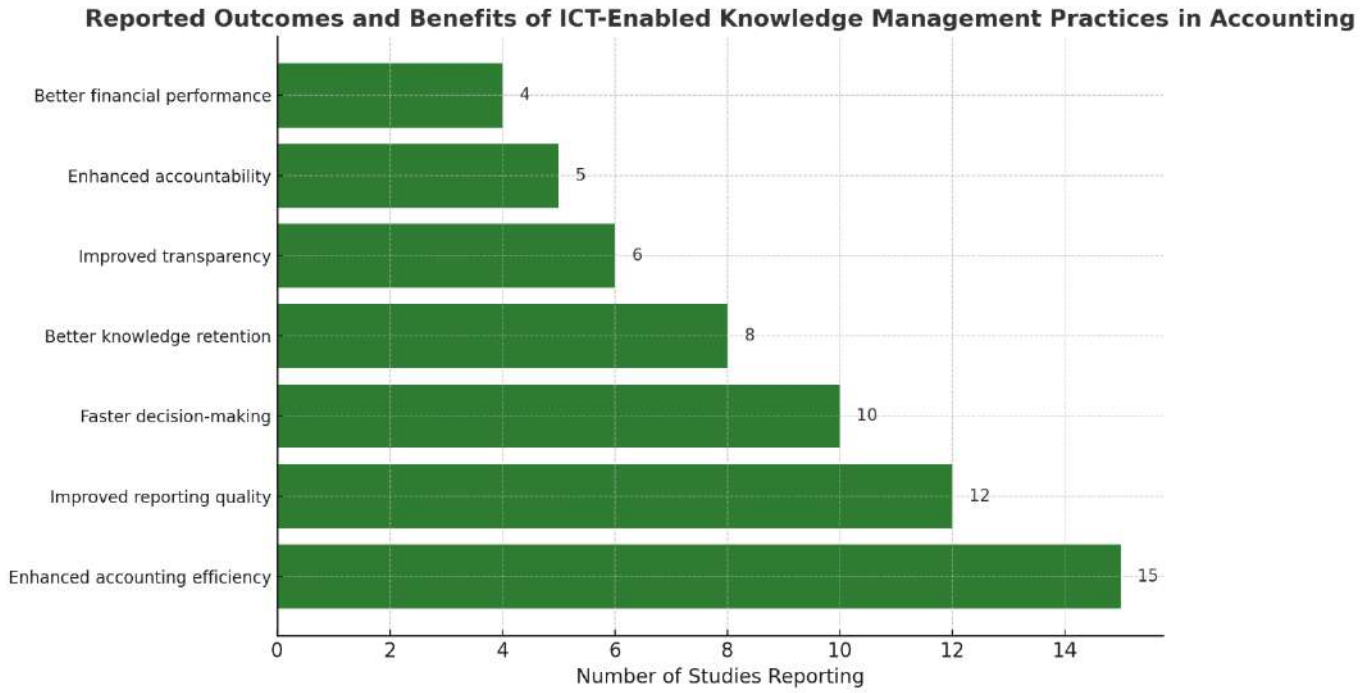

Figure 5

Bar Chart of Reported Outcomes and Benefits of ICT-Enabled KM in Accounting (2020–2025)

positive impacts of ICT-KM integration are shown in Figure 3: improved accounting efficiency - reported by 15 studies, improved reporting quality and faster decision-making. These advantages highlight the role played by ICT in knowledge-based accounting system strategically.

4.4 Research Gaps and Future Directions

Despite these benefits, gaps remain. There have been a few longitudinal studies track the long-term outcomes of ICT-KM adoption (Dalvi-Esfahani et al., 2025; Vu et al.,2020). While powerful technologies like AI, blockchain and analytics remain underdeveloped in accounting practices, the latter is not an exception even in Africa (Vărzaru, 2022; Lubua, 2022; Cheng et al., 2021). Context-based research on the role of organisational, cultural and institutional factors in KM and ICT adoption decisions in accounting environments has become limited as well (Souza & Gasparetto, 2020). Filling these gaps will help guide policy, training and technology intervention strategies that are effective and culturally sensitive.

Table 8

Identified Research Gaps and Suggested Future Research Directions in ICT-KM Accounting Studies

Identified Research Gap	No. of Studies Reporting	References	Suggested Future Research Direction
Paucity of longitudinal studies on the ICT-KM impacts	8	Dalvi-Esfahani et al., 2025; Vărzaru, 2022; Lubua, 2022; Vu et al., 2020	Evidence studies: Are there longer-term effects of ICT-KM?
Little is known about how firms adopt KM practices			
Poor incorporation of new technologies (AI, cloud and analytics)	10	Al-Okaily, 2025; Thottoli, 2024; Kareem et al., 2021; Cheng et al., 2021	Adoption and impact of AI, enhanced tools in accounting explored
Lack of context-specific evidence in African accounting environment	12	Lubua, 2022; Ndemewah & Hiebl, 2022; Pradhan et al., 2021	A similar study should be conducted among the African universities and public sector organizations
Weak policy, environment and training support	15	Lubua, 2022; Vărzaru, 2022	Explore mechanisms to enhance policy, systems, and human capacity
Little is known about how firms adopt KM practices	9	Kareem et al., 2021; Broccardo et al., 2025	Investigate determinants of KM uptake in accounting firms

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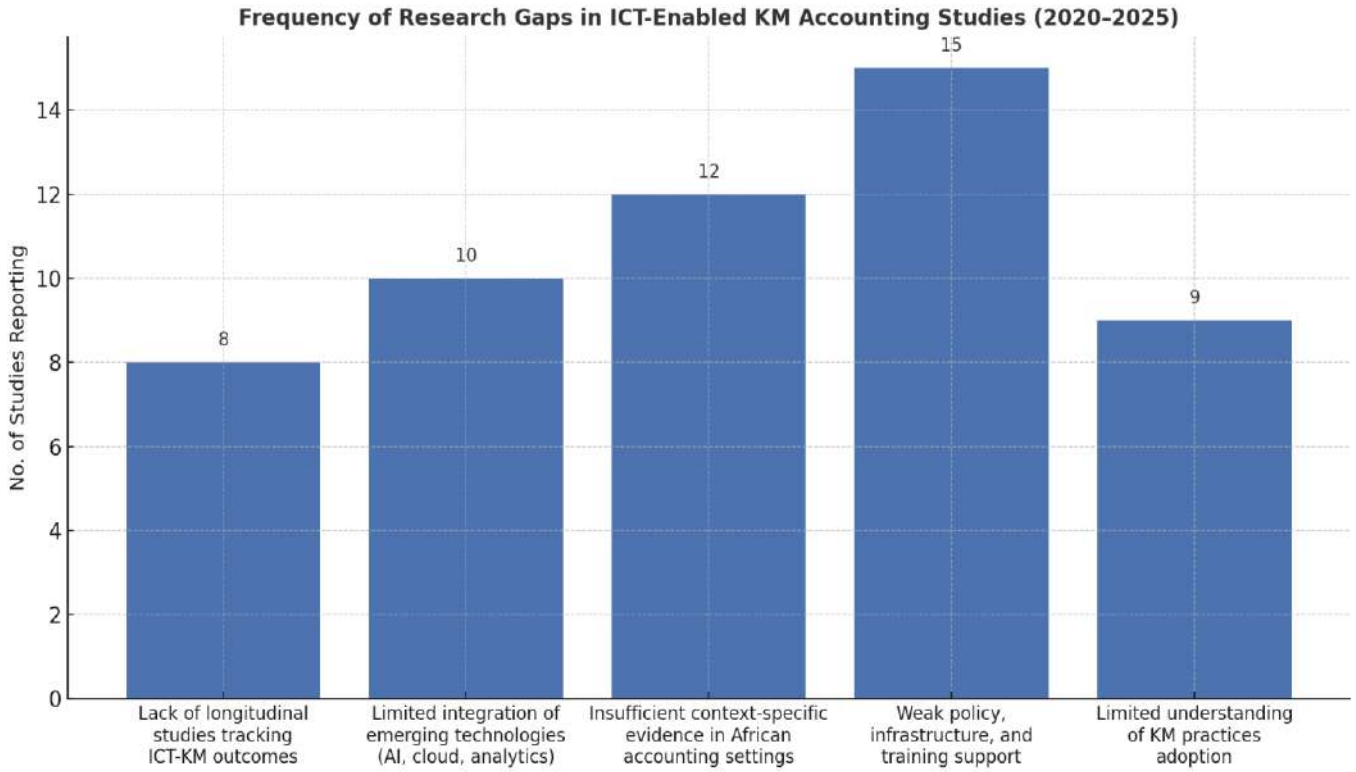

Figure 6
Bar Chart of Frequently Reported Research Gaps in ICT-KM Accounting Studies (2020–2025)

Studies identified prioritized research gaps, among which the need for context-specific data in Africa and for greater utilization of new technologies featured most prominently Fig. 6 provides back-up for the analysis in Table 8 and highlights recourse areas for future investigation.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This review focused on recent (2020s) empirical studies of ICT and KM adoption in accounting. The results verify that ICT adoption, including accounting software and cloud-based systems, is of significant importance to both accuracy and transparency of reporting as well as operational efficiency. When complemented with KMs practices such as knowledge sharing and internalization, these technologies enhance decision quality and financial performance. Nonetheless, numerous studies describe remaining obstacles, such as a lack of infrastructure and training, and low institutional readiness in particular in developing countries.

5.2 Recommendations

The response to these challenges should include stronger institutional policies, tailored capacity development and context-specific research. The investment in both ICT infrastructure and training programme can enhance the level of KM adoption, while integrating a KM framework within an accounting process would facilitate the flow of knowledge and stimulate innovation. Future research may be directed to the long-term effects, the role of emerging technologies such as AI (Artificial Intelligence) and data analytic and more in-depth understanding of the African accounting context. These steps are necessary to allow accounting systems that are more efficient and knowledge based.

REFERENCES

Adjei, J. K., Adams, S., & Mamattah, L. (2021). Cloud computing adoption in Ghana: Accounting for institutional factors. *Technology in Society*, *65*, 101583. https://doi.org/10.1016/j.techsoc.2021.101583

Al-Dmour, A., Zaidan, H., & Al Natour, A. R. (2023). The impact knowledge management processes on business performance via the role of accounting information quality as a mediating factor. *VINE Journal of Information and Knowledge Management Systems*, *53*(3), 523–543. https://doi.org/10.1108/VJIKMS-12-2020-0219

Aljarallah, M. K. (2020). Accounting information systems and knowledge management. *International Journal of Managing Public Sector Information and Communication Technologies*, *11*(2/3), 1–9.

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Al-Okaily, M. (2025). Attitudes toward the adoption of accounting analytics technology in the digital transformation landscape. *Journal of Accounting & Organizational Change, 21*(3), 593–613. https://doi.org/10.1108/JAOC-04-2024-0127

Alvarenga, A., Matos, F., Godina, R., & Matias, J. C. O. (2020). Digital transformation and knowledge management in the public sector. *Sustainability, 12*(14), 5824. https://doi.org/10.3390/su12145824

Birt, J., Safari, M., & de Castro, V. B. (2023). Critical analysis of integration of ICT and data analytics into the accounting curriculum: A multidimensional perspective. *Accounting & Finance, 63*(4), 4037–4063. https://doi.org/10.1111/acfi.13084

Bresciani, S., Rehman, S. U., Giovando, G., & Alam, G. M. (2023). The role of environmental management accounting and environmental knowledge management practices influence on environmental performance: Mediated-moderated model. *Journal of Knowledge Management, 27*(4), 896–918. https://doi.org/10.1108/JKM-12-2021-0953

Broccardo, L., Giordino, D., Yaqub, M. Z., & Alshibani, S. M. (2025). Implementing sustainability: What role do knowledge management and management accounting play? Agenda for environmentally friendly businesses. *Corporate Social Responsibility and Environmental Management, 32*(1), 383–403. https://doi.org/10.1002/csr.2936

Cheng, C. Y., Chien, M. S., & Lee, C. C. (2021). ICT diffusion, financial development, and economic growth: An international cross-country analysis. *Economic Modelling, 94*, 662–671. https://doi.org/10.1016/j.econmod.2020.02.008

Daff, L. (2021). Employers' perspectives of accounting graduates and their world of work: Software use and ICT competencies. *Accounting Education, 30*(5), 495–524. https://doi.org/10.1080/09639284.2021.1935282

Dalvi-Esfahani, M., Barati-Ahmadabadi, H., Ramayah, T., Turner, J. J., Iahad, N. A., & Azar, N. (2025). Stimulus-organism-response framework of decision-makers intention to adopt generative AI to replace entry-level jobs: The moderating impact of personality traits. *Technological Forecasting and Social Change, 219*, 124291. https://doi.org/10.1016/j.techfore.2025.124291

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Durst, S., Foli, S., & Edvardsson, I. R. (2024). A systematic literature review on knowledge management in SMEs: Current trends and future directions. *Management Review Quarterly, 74*(1), 263–288. https://doi.org/10.1007/s11301-022-00299-0

Grossi, G., Kallio, K. M., Sargiacomo, M., & Skoog, M. (2020). Accounting, performance management systems and accountability changes in knowledge-intensive public organizations: A literature review and research agenda. *Accounting, Auditing & Accountability Journal, 33*(1), 256–280. https://doi.org/10.1108/AAAJ-02-2019-3869

Hamad, H. A., Hamza, P. A., Gardi, B., Saeed, K., Qader, D., & Anwar, G. (2021). The influence of accounting software in minimizing business costs. *International Journal of Engineering, Business and Management, 5*(5), 13–22. https://doi.org/10.22161/ijebm.5.5.4

Jackson, D., & Allen, C. (2024). Technology adoption in accounting: The role of staff perceptions and organisational context. *Journal of Accounting & Organizational Change, 20*(2), 205–227. https://doi.org/10.1108/JAOC-01-2023-0007

Kareem, H. M., Aziz, K. A., Maelah, R., Yunus, Y. M., Alsheikh, A., & Alsheikh, W. (2021). The influence of accounting information systems, knowledge management capabilities, and innovation on organizational performance in Iraqi SMEs. *International Journal of Knowledge Management, 17*(2), 1–32. https://doi.org/10.4018/IJKM.2021040104

Kareem, H. M., Dauwed, M., Meri, A., Jarrar, M. T., Al-Bsheish, M., & Aldujaili, A. A. (2021). The role of accounting information system and knowledge management to enhancing organizational performance in Iraqi SMEs. *Sustainability, 13*(22), 12706. https://doi.org/10.3390/su132212706

Krah, R., & Mertens, G. (2023). Financial transparency, trust and willingness to pay in local governments of sub-Saharan Africa. *Journal of Public Budgeting, Accounting & Financial Management, 35*(6), 100–120. https://doi.org/10.1108/JPBAFM-06-2022-0110

Lubua, E. W. (2022). Factors affecting the adoption of information and communication technologies in Africa: Literature review. https://digitalcommons.kennesaw.edu/acist/2022/presentations/1

Mediaty, M., Usman, A., Yusuf, M. S. K., & Sandy, K. N. (2025). Enhancing government accountability through responsibility accounting: A systematic literature review. *Journal of Management, Accounting, General Finance and International Economic Issues, 4*(4), 904–919. https://doi.org/10.55047/marginal.v4i4.1790

Murthy, U. S., Park, J. C., Smith, T., & Whitworth, J. (2023). Audit efficiency and effectiveness consequences of accounting system homogeneity across audit clients: A new form of knowledge spillover? *The Accounting Review, 98*(2), 389–418. https://doi.org/10.2308/TAR-2020-0609

Licensed Under Creative Commons Attribution (CC BY-NC)

Ndemewah, S. R., & Hiebl, M. R. (2022). Management accounting research on Africa. *European Accounting Review*, *31*(4), 10291–1057. https://doi.org/10.1080/09638180.2021.1897025

Nonaka, I., & Takeuchi, H. (1995). *The knowledge-creating company: How Japanese companies create the dynamics of innovation*. Oxford University Press.

Noordin, N. A., Hayek, A., Sejdini, M., Humaid, A., Sultan, N., Abdulla, B., & Yousif, M. (2024, January). Financial information quality: Analysis of cloud accounting adoption on UAE firms. In *International Conference on Business Analytics in Practice* (pp. 325–340). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-61589-4_25

Osaloni, B. O., Akinadewo, I. S., Ogungbade, O. I., & Oluwadare, O. O. (2023). Adoption of ICT and efficiency in accounting practice in Nigeria. *International Journal of Research*, *10*(04), 284–302. https://doi.org/10.5281/zenodo.7838536

Paoloni, M., Coluccia, D., Fontana, S., & Solimene, S. (2020). Knowledge management, intellectual capital and entrepreneurship: A structured literature review. *Journal of Knowledge Management*, *24*(8), 1797–1818. https://doi.org/10.1108/JKM-01-2020-0052

Pradhan, R. P., Arvin, M. B., Nair, M. S., Hall, J. H., & Bennett, S. E. (2021). Sustainable economic development in India: The dynamics between financial inclusion, ICT development, and economic growth. *Technological Forecasting and Social Change*, *169*, 120758. https://doi.org/10.1016/j.techfore.2021.120758

Qader, K. S., Jamil, D. A., Sabah, K. K., Anwer, S. A., Mohammad, A. J., Gardi, B., & Abdulrahman, B. S. (2022). The impact of technological acceptance model (TAM) outcome on implementing accounting software. *International Journal of Engineering, Business and Management*, *6*(6), 14–24. https://doi.org/10.22161/ijebm.6.6.3

Rashid, M. M., Ali, M. M., & Hossain, D. M. (2021). Strategic management accounting practices: A literature review and opportunity for future research. *Asian Journal of Accounting Research*, *6*(1), 109–132. https://doi.org/10.1108/AJAR-06-2019-0051

Salem, R. I. A., Ezeani, E., Gerged, A. M., Usman, M., & Alqatamin, R. M. (2021). Does the quality of voluntary disclosure constrain earnings management in emerging economies? Evidence from Middle Eastern and North African banks. *International Journal of Accounting & Information Management*, *29*(1), 91–126. https://doi.org/10.1108/IJAIM-07-2020-0109

Souza, F. F., & Gasparetto, V. (2020). Innovative organization dimensions and the adoption of modern management accounting practices. *Revista Gestão & Tecnologia*, *20*(3), 145–166. https://doi.org/10.20397/2177-6652/2020.v20i3.1957

Thottoli, M. M. (2021). Knowledge and use of accounting software: Evidence from Oman. *Journal of Industry-University Collaboration*, *3*(1), 2–14. https://doi.org/10.1108/JIUC-04-2020-0005

Thottoli, M. M. (2024). Leveraging information communication technology (ICT) and artificial intelligence (AI) to enhance auditing practices. *Accounting Research Journal*, *37*(2), 134–150. https://doi.org/10.1108/ARJ-09-2023-0269

Thottoli, M. M., & Ahmed, E. R. (2022). Information technology and E-accounting: Some determinants among SMEs. *Journal of Money and Business*, *2*(1), 1–15. https://doi.org/10.1108/JMB-05-2021-0018

Ubesie, C., & Erhimu, D. (2024). Effect of Information & Communication Technology (ICT) on accounting practices in Nigeria using First Bank Plc Awka, Anambra State as an evidence of study. *Research Journal of Financial Sustainability Reporting*, *6*(2), 130–142. https://deptofaccy-esut.com.de/index.php/rjfsr/article/view/100

Vărzaru, A. A. (2022). Assessing artificial intelligence technology acceptance in managerial accounting. *Electronics*, *11*(14), 2256. https://doi.org/10.3390/electronics11142256

Vendrell-Herrero, F., Darko, C. K., & Ghauri, P. (2020). Knowledge management competences, exporting and productivity: Uncovering African paradoxes. *Journal of Knowledge Management*, *24*(1), 81–104. https://doi.org/10.1108/JKM-07-2018-0433

Vu, K., Hanafizadeh, P., & Bohlin, E. (2020). ICT as a driver of economic growth: A survey of the literature and directions for future research. *Telecommunications Policy*, *44*(2), 101922. https://doi.org/10.1016/j.telpol.2020.101922

Zheng, H., & Ma, W. (2022). Impact of ICT adoption on cosmetic expenditure of Chinese residents: An exploration accounting for urban-rural differentials. *Applied Economics Letters*, *29*(14), 1286–1291. https://doi.org/10.1080/13504851.2021.1927953

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A systematic review of data analytics adoption in faith-based universities in Kenya

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ABSTRACT

This study presents a systematic literature review examining the adoption of data analytics in Faith-Based Universities (FBUs) in Kenya, with emphasis on the role of human capital development (HCD) and institutional readiness. Anchored on the Unified Theory of Acceptance and Use of Technology (UTAUT) and Institutional Theory, the review synthesized evidence from sixty peer-reviewed studies published between 2015 and 2025. Guided by PRISMA protocols and quality-appraised using the Mixed-Methods Appraisal Tool (MMAT), the analysis applied thematic synthesis to capture enablers, barriers, and institutional impacts. Findings reveal that FBUs remain at an early stage of adoption compared to public and private secular universities, constrained by infrastructural deficits, limited digital literacy, financial challenges, and theological caution. Leadership commitment, investment in ICT infrastructure, and cross-institutional collaborations emerged as key enablers, while human capital development was identified as a cornerstone for sustainable adoption. Evidence shows that where analytics were successfully integrated, FBUs experienced gains in student monitoring, institutional planning, regulatory compliance, and governance transparency, especially when aligned with faith-based missions and values. The review concludes that advancing analytics adoption in FBUs requires embedding data use into strategic plans, scaling continuous staff training, and fostering evidence-based cultures that harmonize technological innovation with institutional identity.

Keywords: Adoption of Data Analytics, Human Capital Development, Faith-Based Universities, Institutional Theory

I. INTRODUCTION

The increasing availability of big data has revolutionized operations and decision-making in higher education institutions (HEIs) worldwide. Data analytics enables universities to monitor student engagement, personalize learning experiences, optimize resource allocation, and support strategic planning. With the advancement of learning management systems (LMS), student information systems (SIS), and predictive analytics tools, HEIs now have unprecedented opportunities to harness data for academic excellence and institutional efficiency (Daniel, 2015; Mohammed,2024; Tsai et al., 2020).

Data analytics plays a pivotal role in improving student performance, enabling early warning systems, and informing pedagogical reforms. In administrative domains, analytics supports budget planning, infrastructure development, and compliance reporting (Mwangi, 2024). Furthermore, data-driven approaches have been linked to improved institutional transparency and accountability (Siemens & Long, 2011). As such, many HEIs in developed countries have embedded analytics into their core operations, transforming them into intelligent, adaptive learning ecosystems.

However, the picture is less optimistic in the global south, where structural challenges such as limited infrastructure, low digital literacy, and funding constraints hinder widespread adoption (Owino, 2023). In Sub-Saharan Africa, HEIs often face technical and organizational obstacles that slow down the uptake of data technologies (Nganga, 2020). Within this broader context, Faith-Based Universities (FBUs) occupy a distinct niche. These institutions combine academic objectives with religious values and governance systems, which shape their receptivity to innovation. FBUs in Kenya often operate autonomously and are not fully integrated into national digital transformation agendas, which further exacerbate their marginalization in policy and practice (Nganga, 2020).

Existing literature acknowledges the transformative potential of data analytics but rarely examines its implementation within the specific context of FBUs (Prinsloo & Kaliisa, 2022). Studies tend to focus on public or large private universities, overlooking the ideological, cultural, and institutional dynamics that influence technology adoption in faith-based settings (Parthe, 2023). While global frameworks such as the Unified Theory of Acceptance and Use of Technology (UTAUT) emphasize perceived usefulness and ease of use, these do not fully capture the organizational conservatism, ethical concerns, or capacity deficits prevalent in FBUs. Similarly, while Institutional Theory helps explain institutional inertia, few studies apply it to understanding resistance in values-driven institutions.

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A significant gap exists in understanding how human capital development (HCD) mediates the relationship between institutional readiness and analytics adoption. Research suggests that staff training, leadership engagement, and capacity-building efforts are critical to successful implementation (Knight et al., 2016; Mbatha et al., 2021). Yet, most FBUs lack structured professional development programs that address digital literacy and analytics competence. Moreover, data governance policies are often underdeveloped, leaving staff and administrators without clear guidelines for ethical and effective data use.

1.1 Statement of the Problem

Although data analytics holds significant potential to transform higher education, FBUs in Kenya continue to lag in its adoption. This slow uptake is attributed to a confluence of challenges related to inadequate digital infrastructure, limited human capacity, and misalignment between institutional cultures and technological innovation. Moreover, FBUs have not benefited from nationwide ICT interventions and lack context-specific frameworks to guide the effective integration of data analytics. The role of human capital development in addressing these deficits remains insufficiently explored. These empirical gaps impede evidence-based policy formulation and practical strategies aimed at fostering digital transformation within FBUs, thereby constituting a critical knowledge gap that this study seeks to address.

1.2 Research Objectives

The specific objectives were to:

i. Assess the current state and patterns of data analytics adoption in higher education institutions, with emphasis on FBUs in Kenya.
ii. Identify key enablers and barriers influencing the adoption of data analytics in FBUs.
iii. Analyze the contribution of human capital development to the adoption and institutionalization of analytics in FBUs.
iv. Explore the institutional outcomes and performance impacts associated with data analytics use in faith-based higher education.
v. Propose practical recommendations for improving data analytics adoption in FBUs through strategic investments in HCD and infrastructure.

II. LITERATURE REVIEW

2.1 Theoretical Review

The adoption and interpretation of data analytics in Faith-Based Universities (FBUs) can best be understood through a multidimensional theoretical lens that integrates both individual and organizational dynamics. This study therefore adopts a hybrid model that combines the Unified Theory of Acceptance and Use of Technology (UTAUT) and Institutional Theory to explain technology adoption within FBUs.

According to Venkatesh et al. (2003), the UTAUT model explicates technology acceptance based on four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. These constructs are moderated by demographic factors such as age, gender, and experience. Within the FBU context, performance expectancy reflects how curriculum implementers and administrators perceive the contribution of analytics to improving student performance and institutional planning. Effort expectancy denotes the perceived complexity of using analytics platforms, a challenge often associated with limited exposure and inadequate training. Social influence relates to the effect of peers, institutional leaders, and religious authorities on the decision to adopt technology, while facilitating conditions encompass the availability of supportive infrastructure such as internet connectivity, digital tools, ICT personnel, and enabling institutional policies.

Despite its relevance, the UTAUT framework is primarily individualistic and does not sufficiently consider the wider organizational and cultural contexts that influence technology adoption in FBUs (Aro, 2024). In these institutions, decision-making is not purely rational or individual but is often shaped by collective norms, values, and theological commitments. To address this limitation, the present study incorporates Institutional Theory (DiMaggio & Powell, 1983), which emphasizes the role of coercive, mimetic, and normative pressures in determining organizational behavior and innovation. Coercive pressures arise from external demands such as government regulations, accreditation standards, or donor requirements. Mimetic pressures emerge when institutions emulate the practices of successful peers to maintain legitimacy, while normative pressures stem from the ethical, theological, and professional values embedded within the institutional culture.

Normative pressures are particularly strong in FBUs, where concerns about surveillance, data privacy, and the potential incompatibility of analytics with spiritual or moral principles may lead to hesitation or resistance. These pressures can influence whether institutions embrace or reject emerging technologies. In combining UTAUT and Institutional Theory, this study provides a more comprehensive framework for understanding both individual behavioral

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intentions and organizational efforts to maintain institutional legitimacy. It also highlights the importance of aligning technology adoption strategies with the cultural and religious values of FBUs to ensure meaningful and sustainable digital transformation.

2.1.1 Data Analytics in Higher Education

The rise of data-driven decision-making has transformed HEIs across the globe, creating new opportunities for enhancing teaching, learning, and administrative functions (Ghosh et al., 2024). Data analytics in education is broadly defined as the systematic use of data to generate insights that inform decision-making at individual, institutional, and system levels (Bowers, 2018). It encompasses a range of approaches, including descriptive analytics (summarizing historical data), predictive analytics (forecasting future trends and behaviors), and prescriptive analytics (offering recommendations for action) (Blessing et al., 2025). Together, these approaches allow HEIs to improve efficiency, effectiveness, and accountability.

Data analytics is widely used in the academic field to track student achievement, predict student dropout as well as to design pre-emptive intervention strategies. These types of tools have been used to select at-risk-students that enable proactive assistance to boost retention and completion rates (Larrabee Sonderlund et al., 2018; Selwyn et al., 2016). In learning contexts, analytics embedded in learning management systems (LMS) and student information systems (SIS) generate fine-grained data on student engagement and performance, which can be used to personalize learning pathways, tailor feedback, and guide pedagogical reforms (Johar et al., 2023; Philip and Nyakerario, 2023).

Practically, data analytics is a critical concept of managing and planning the institution outside of the classroom. Some of the functions that analytics assist in on the administrative side would be a budget allocation, infrastructure planning, and compliance reporting (Frempong, 2022). The analytic tools that come to the system present an insight into the enrolment pattern, staff work and functionality to allow the HEIs to match the sources with the institutional priority. To this end, data analytics play an important role not only of quality assurance in academics but also institutional competitiveness in institutions that still experience dynamic environments (Stojanov & Daniel, 2017).

The global economies have made significant progress in using analytics into the sphere of higher education and apply it to their student life-cycle management and monitoring their performance (Larrabee Sonderlund, Hughes & Smith, 2018). However, in Sub-Saharan Africa, the adoption remains low due to infrastructural challenges, digital illiteracy and weak institutional support framework (Mukuni, 2019). Additionally, there has been a history of challenges of governance lapses, lack of leadership support, low development of human capital (Nikita et al., 2024).

Within this broader context, FBUs in Kenya represent a unique case. Their dual mandate of academic and religious objectives, coupled with autonomous governance structures, shapes their readiness to embrace technological innovations. While data analytics could greatly enhance service delivery, student outcomes, and institutional accountability in FBUs, adoption has been hindered by cultural conservatism, inadequate professional development programs, and exclusion from national digital transformation policies (Gkrimpizi et al., 2023). Existing literature tends to overlook these institutions, focusing instead on public or large private universities, leaving a critical gap in understanding the role of data analytics within values-driven higher education settings.

This review therefore situates FBUs within the broader discourse on data analytics in higher education, with particular attention to the mediating role of human capital development in overcoming infrastructural, organizational, and cultural barriers.

III. METHODOLOGY

This study adopted a Systematic Literature Review (SLR) approach grounded in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparency, rigor, and reliability. The review synthesized peer-reviewed literature on data analytics adoption in higher education, with a specific focus on HCD and institutional performance in FBUs in Kenya. The methodology consisted of a clearly defined search strategy, study selection process, quality appraisal, and thematic synthesis of findings.

3.1 Search Strategy

A search was conducted across six reputable academic databases: Scopus, Web of Science, IEEE Xplore, Google Scholar, Springer Link, and Science Direct. These platforms were selected for their extensive coverage of multidisciplinary peer-reviewed literature, including education, technology, management, and institutional studies. The search focused on studies published between 2015 and 2025 to capture contemporary trends and emerging discourses on analytics in higher education.

To refine the search and ensure relevance, Boolean operators (AND, OR) were applied to formulate targeted queries. Keywords and phrases included combinations such as: ("data analytics adoption" OR "big data in universities") AND ("higher education" OR "faith-based universities"). ("human capital development" OR "staff training" OR

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"capacity building") AND ("data analytics" OR "learning analytics"). ("university performance" OR "decision-making in HEIs") AND ("predictive analytics" OR "data-driven strategies"). The search was limited to English-language articles and prioritized peer-reviewed journal articles, conference papers, and systematic reviews. Grey literature, editorials, and opinion pieces were excluded to maintain scholarly rigor. Reference chaining was also applied to identify relevant studies cited in key articles.

3.2 Study Selection and Quality Evaluation Processes

The study selection followed a structured three-phase process: initial screening, full-text review, and quality assessment. After removing duplicates, all titles and abstracts were reviewed for relevance to the central themes of data analytics, human capital development, and institutional performance within HEIs—specifically faith-based contexts where applicable. Full-text articles were then assessed against inclusion criteria, which required that studies: Be published between 2015 and 2025, Focus on higher education institutions (with preference for or relevance to FBUs), Address data analytics adoption and/or HCD strategies, and be methodologically sound and peer-reviewed.

To ensure quality, selected studies were appraised using the Mixed-Methods Appraisal Tool (MMAT) developed by Hong et al. (2018), which is suitable for evaluating qualitative, quantitative, and mixed-methods research. The MMAT framework assessed relevance, methodological rigor, validity of data collection and analysis, generalizability to FBUs, and source credibility as shown in Table 1. Only studies scoring 60% or above across these criteria were included in the final synthesis, resulting in a corpus of 60 high-quality articles.

Table 1

Appraisal Criteria Based on the Mixed-Methods Appraisal Tool (MMAT)

Criteria	Evaluation Questions
Relevance	Does the study address data analytics adoption in HEIs?
Methodological Rigor	Is the research design appropriate and clearly explained?
Data Validity	Are data collection and analysis methods reliable?
Generalizability	Can the findings be applied to Faith-Based Universities in Kenya?
Publication Type	Is the study published in a peer-reviewed journal or a reputable conference?

Source: (Hong et al., 2018)

3.3 Data Extraction and Analysis

A structured data extraction protocol was employed to capture essential information from each selected study. Extracted data included publication details, study context (country, institutional type, and faith affiliation if any), research objectives, methodology, key findings, challenges identified, and proposed solutions.

Thematic synthesis was used as the analytical approach. This involved coding data from the selected articles and organizing them into key themes and subthemes aligned with the study objectives. Initial codes included terms such as “staff training,” “infrastructure barriers,” “institutional culture,” and “analytics for decision-making.” Through iterative comparison and abstraction, these were grouped into broader thematic categories such as “enablers of adoption,” “barriers and constraints,” “role of HCD,” and “institutional impact.”

Special attention was given to identifying recurring patterns across studies, as well as outliers that offered unique insights into the experiences of FBUs. The synthesis not only summarized findings across contexts but also explored causal relationships, such as how human capital development initiatives influenced adoption outcomes or mitigated resistance in faith-based settings.

Table 2

Summary of Key Themes Identified from the Literature

Theme	Description
Adoption Status	FBUs lag behind in implementing advanced analytics tools
Enablers	Leadership support, infrastructure, policy alignment
Barriers	Poor infrastructure, staff capacity gaps, resistance to change, limited funding
Role of HCD	Critical for skills, leadership development, and long-term sustainability
Institutional Impact	Gains in student performance, planning, and compliance where analytics are well-integrated

To enhance transparency, the study selection process was visualized using a PRISMA flow diagram as shown in Figure 1. The diagram outlines the number of records identified, screened, assessed for eligibility, and ultimately included, providing a visual summary of the methodological rigor applied.

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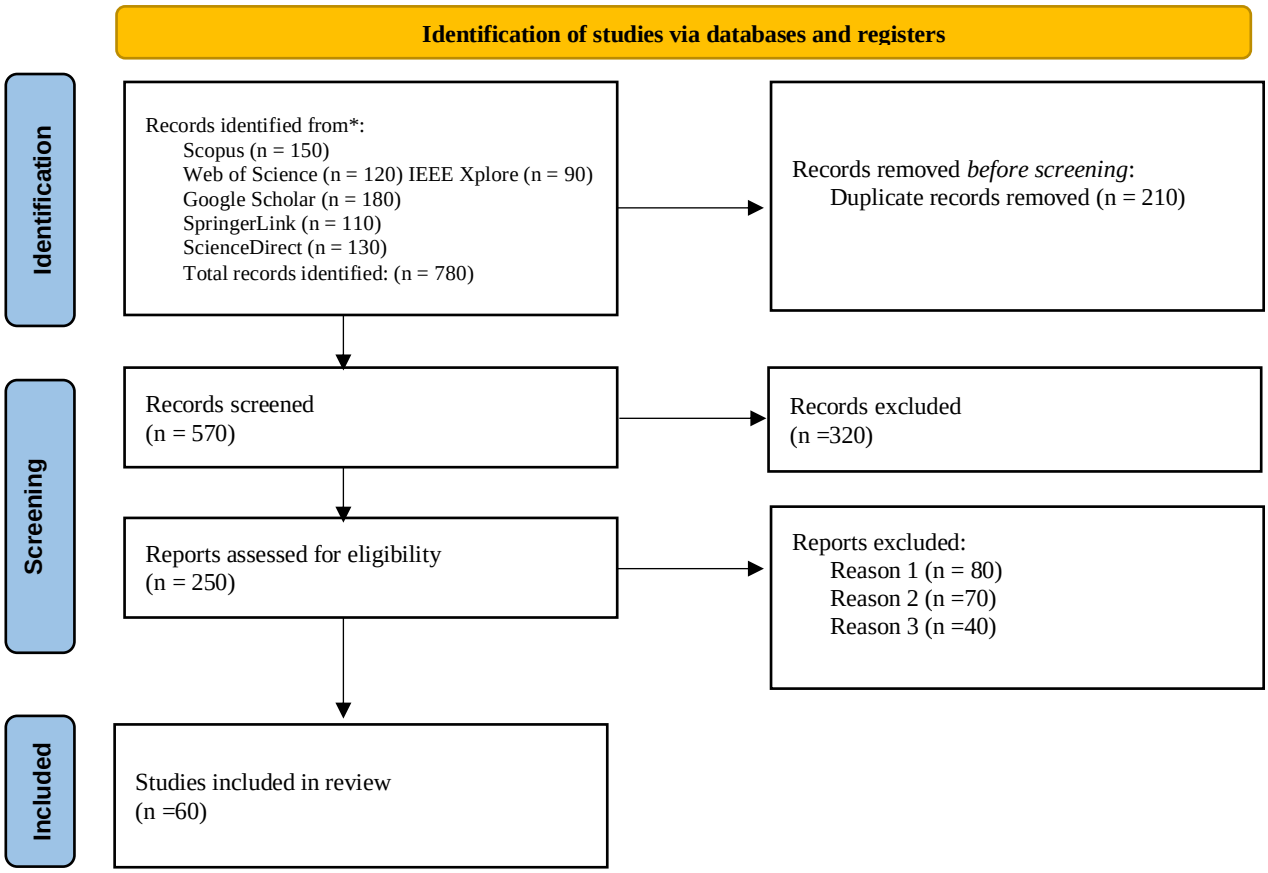

Figure 1
A PRISMA Diagram Visualizing the Study Selection Process
Source : Page et al. (2021)

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The systematic review of sixty studies revealed important insights into the adoption of data analytics in FBUs in Kenya, with particular focus on the role of HCD and institutional readiness. Findings are presented thematically, reflecting the key categories identified in the synthesis: adoption status, enablers, barriers, role of HCD, and institutional impacts.

4.1.1 Adoption Status

The evidence indicates that while data analytics is increasingly recognized in higher education globally, FBUs in Kenya remain at an early stage of adoption. Studies show that public and private secular universities have advanced further in implementing analytics for student retention, curriculum planning, and institutional reporting (Gamede, Ajani & Afolabi, 2021; Siemens & Long, 2011; Bai et al., 2021). By contrast, FBUs lag behind, often due to limited exposure, weaker digital infrastructure, and theological caution toward technological innovations (Smith, 2017; Wango, 2017). Case studies from Kenya and Sub-Saharan Africa suggest that FBUs are aware of the potential of analytics but lack structured policies or frameworks for integration (Wekesa, 2024; Matere, 2024). Similar patterns are observed in other African contexts, where institutions struggle to balance tradition with digital transformation imperatives (Gbadebo, 2024; Kamau, 2020).

4.1.2 Enablers of Adoption

Leadership commitment emerged as a strong determinant of adoption. Institutions where senior leaders championed digital transformation and aligned analytics initiatives with mission-driven goals recorded better progress (Adeniran et al., 2024; Coolen et al., 2023). Infrastructure investment—particularly in learning management systems, digital literacy programs, and governance frameworks—was also identified as a key enabler (Santiago Rivera & Shanks, 2015; UNESCO, 2021; UNESCO, 2022). Cross-institutional collaborations and mentorship arrangements, for example between public universities and FBUs, created opportunities for shared learning and reduced the cost of implementation

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(Gbadebo, 2024; Prabowo & Bandur, 2022). Recent evidence suggests that peer-learning networks in Kenya and Uganda have encouraged FBUs to cautiously experiment with analytics integration (Wekesa, 2024).

4.1.3 Barriers and Constraints

Several barriers were recurrent across studies. Poor ICT infrastructure and unreliable internet access were consistently cited as limiting adoption, particularly in faith-based and rural-based universities (Mbatha, Ngcobo & Mhlongo, 2021; Okwako, 2020). The gap in staff capacity also featured prominently, where most of the academic and administrative staff members did not have the technical knowledge and digital literacy needed (Mokhtari, 2023; Tenya, Maina & Awuor, 2024). The adoption was further limited by institutional resistance, with a basis in either theological issues or fear of surveillance (Jones et al., 2020; Smith, 2017). There was also a constraint in finances whereby investments could not be made on advanced tools, including predictive analytics, big data platforms (Alsheikh, 2018; Adepoju and Pub, 2025). Moreover, there were contextual impediments contributing to those problems, including bureaucratic governments and insufficient donor attention to FBUs (Nikita et al., 2024).

4.1.4 Role of Human Capital Development

Human capital development was consistently identified as a cornerstone for sustainable adoption. Studies highlighted the importance of continuous staff training in analytics tools, data ethics, and pedagogical applications (Anthun & Håland, 2024; Mokhtari, 2023). Leadership development programs were also critical, as institutions with trained leaders who understood both theological contexts and digital trends were more likely to adopt analytics meaningfully (Njenga, 2016; Kamau, 2020). Case-specific findings from FBUs in Kenya revealed that when staff received targeted capacity-building in digital literacy, resistance decreased and adoption accelerated (Wekesa, 2024; Matere, 2024). Scholars emphasize that HCD is not only a technical necessity but also a cultural bridge in religious contexts, as it facilitates alignment between data-driven approaches and theological values (Knight et al., 2016; Tenya, Maina & Awuor, 2024).

4.1.5 Institutional Impacts

Where data analytics was successfully integrated, institutions reported measurable benefits. Positive outcomes included improved student performance monitoring, enhanced planning and resource allocation, and better compliance with regulatory requirements (Al-Zahrani & Alasmari, 2023; Sithumini et al., 2024; Wilbrod et al., 2024). In some cases, analytics supported personalized learning pathways that increased student engagement (Khor & K, 2023; Shete et al., 2024). Evidence also suggests that analytics use strengthened accountability and transparency in institutional governance, contributing to both academic and ethical excellence (Ahmed et al., 2024; Adepoju & Pub, 2025). Early adopters among Kenyan FBUs demonstrated that aligning analytics with faith-based values and mission statements increased legitimacy and stakeholder acceptance (Matere, 2024; Wekesa, 2024.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The findings show that although FBUs in Kenya have identified the importance of data analytics in enhancing student engagement, academic excellence, and administration, adoption is still hampered by institutional constraints, ineffective digital literacy levels, and the appropriateness of technological solutions within a theological and ethics-oriented clothesline. An analysis of sixty academic publications supported the notion that effective implementation of analytics in higher education necessitates effective leadership, sufficient resources and structures that are institutionally appropriate and specific to context.

5.2 Recommendations

To overcome these barriers, FBUs should integrate analytics into strategic planning, invest in continuous staff training, and foster a culture of evidence-based decision-making.

REFERENCES

Adeniran, I., Efunniyi, C., Osundare, O., & Abhulimen, A. (2024). Integrating data analytics in academic institutions: Enhancing research productivity and institutional efficiency. *International Journal of Scholarly Research in Multidisciplinary Studies, 5*(1), 77–87. https://doi.org/10.56781/ijsrms.2024.5.1.0041

Adepoju, A., & Pub, A. (2025). A data governance framework for high-impact programs: Reducing redundancy and enhancing data quality at scale. *International Journal of Multidisciplinary Research and Growth Evaluation, 4*(1), 1141–1154.

Licensed Under Creative Commons Attribution (CC BY-NC)

Ahmed, J., Kathambi, B., & Robert, K. (2023). Barriers to community participation in governance standards setting for sustainable mangrove management in Lamu County. *Open Journal of Forestry, 13*(4), 353–367. https://doi.org/10.4236/ojf.2023.134021

Alsheikh, M. (2018). Challenges facing big data adoption in developing countries' higher education. *International Journal of Information and Communication Technology Education, 14*(3), 22–34.

Al-Zahrani, A., & Alasmari, T. (2023). Learning analytics for data-driven decision making: Enhancing instructional personalization and student engagement in online higher education. *International Journal of Online Pedagogy and Course Design, 13*(1), 1–18. https://doi.org/10.4018/IJOPCD.331751

Anthun, K., Håland, E., et al. (2024). What influences the use of HR analytics in human resource management in Norwegian municipal health care services? *BMC Health Services Research, 24*, 1131. https://doi.org/10.1186/s12913-024-11610-y

Aro, O. (2024). Predictive analytics in financial management: Enhancing decision-making and risk management. *International Journal of Research Publication and Reviews, 5*(10), 2181–2194. https://doi.org/10.55248/gengpi.5.1024.2819

Bai, X., Zhang, F., Li, J., Guo, T., Aziz, A., Jin, A., & Xia, F. (2021). Educational big data: Predictions, applications, and challenges. *Big Data Research, 26*, 100270. https://doi.org/10.1016/j.bdr.2021.100270

Bowers, A. J., Choi, Y., Shi, H., Sun, F., Sun, H., Williams, J., & Weeks, S. (2022). Mapping 16 equity indicators to the New York City schools public datasets: Access, opportunity, and outcomes. Teachers College, Columbia University.

Coolen, P., Heuvel, S., Voorde, K., & Paauwe, J. (2023). Understanding the adoption and institutionalization of workforce analytics: A systematic literature review and research agenda. *Human Resource Management Review, 33*(4), 100985. https://doi.org/10.1016/j.hrmr.2023.100985

Daniel, B. (2015). Big data and analytics in higher education: Opportunities and challenges. *British Journal of Educational Technology, 46*(5), 904–920.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147–160.

Frempong, D., Akinboboye, O., Okoli, I., Afrihyia, E., Umar, M., Umana, A., Appoh, M., & Omolayo, O. (2022). Real-time analytics dashboards for decision-making using Tableau in public sector and business intelligence applications. *Journal of Frontiers in Multidisciplinary Research, 3*, 65–80. https://doi.org/10.54660/.IJFMR.2022.3.2.65-80

Gamede, B., Ajani, O., & Afolabi, O. (2021). Exploring the adoption and usage of learning management systems as an alternative for curriculum delivery in South African higher education institutions during COVID-19 lockdown. *International Journal of Higher Education, 11*(1), 71–81. https://doi.org/10.5430/ijhe.v11n1p71

Gbadebo, A. (2024). Digital transformation for educational development in Sub-Saharan Africa. *International Journal of Social Science and Religion, 5*(3), 397–418. https://doi.org/10.53639/ijssr.v5i3.262

Ghosh, P., Sharma, A., Sharma, K., Priya, P., & Prasad, S. (2024). Harnessing AI for organizational excellence: Interdisciplinary strategies for enhancing marketing, HR, and financial performance through data-driven decision-making. *European Economics Letters, 14*(2), 632–640.

Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of barriers to digital transformation in higher education institutions: Systematic literature review. *Education Sciences, 13*(7), 746. https://doi.org/10.3390/educsci13070746

Hong, Q. N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., & Vedel, I. (2018). Mixed methods appraisal tool (MMAT), version 2018, user guide. McGill. http://mixedmethodsappraisaltoolpublic.pbworks.com

Johar, N. A., Kew, S., Tasir, Z., & Koh, E. (2023). Learning analytics on student engagement to enhance students' learning performance: A systematic review. *Sustainability, 15*(10), 7849. https://doi.org/10.3390/su15107849

Jones, K., Asher, A., Goben, A., Perry, M., Salo, D., Briney, K., & Robertshaw, M. (2020). "We're being tracked at all times": Student perspectives of their privacy in relation to learning analytics in higher education. *Journal of the Association for Information Science and Technology, 71*(9), 1048–1059. https://doi.org/10.1002/asi.24358

Khor, E., & Mutthulakshmi, K. (2023). A systematic review of the role of learning analytics in supporting personalized learning. *Education Sciences, 14*(1), 51. https://doi.org/10.3390/educsci14010051

Knight, S., Buckingham Shum, S., & Littleton, K. (2016). Epistemology, pedagogy, assessment, and learning analytics. *Journal of Learning Analytics, 3*(2), 187–210.

Larrabee Sonderlund, A., Hughes, E., & Smith, J. (2018). The efficacy of learning analytics interventions in higher education: A systematic review. *British Journal of Educational Technology, 50*(5), 2594–2618. https://doi.org/10.1111/bjet.12720

Mbatha, B., Ngcobo, S., & Mhlongo, B. (2021). Exploring educators' readiness for digital transformation in rural-based universities. *South African Journal of Higher Education, 35*(6), 112–128.

Licensed Under Creative Commons Attribution (CC BY-NC)

Mohammed, M. S. (2024). Review of literature on the use of learning analytics and learning analytical dashboards in improving student performance in higher education institutions in Kenya. *International Journal of Research and Innovation in Applied Science, 9*(5).

Mokhtari, F. (2023). Fostering digital literacy in higher education: Benefits, challenges, and implications. *International Journal of Linguistics, Literature, and Translation, 6*(10), 160–167. https://doi.org/10.32996/ijllt.2023.6.10.19

Mukuni, J. (2019). Challenges of educational digital infrastructure in Africa: A tale of hope and disillusionment. *Journal of African Studies and Development, 11*(7), 59–63. https://doi.org/10.5897/JASD2019.0539

Mwangi, J. (2024). Impact of digital learning tools on student performance in Kenya. *African Journal of Education and Practice, 9*, 13–22. https://doi.org/10.47604/ajep.2521

Nikita, N. A., Azim, K. S., Jafor, A., Shayed, A. U., Hossain, M. A., & Khan, O. U. (2024). Digital transformation in non-profit organizations: Strategies, challenges, and successes. *Advanced International Journal of Multidisciplinary Research, 2*, 13–20.

Njenga, M. (2016). Effects of change management strategy on performance in public universities in Kenya: The case of the Technical University of Kenya. *Strategic Journal of Business & Change Management, 3*(2). https://doi.org/10.61426/sjbcm.v3i2.260

Odengo, R., Bula, H., & Kiiru, D. (2022). Moderating effect of human resource policies on balanced contract and performance of academic staff in selected public universities. *Journal of Human Resource and Leadership, 7*(1), 94–106. https://doi.org/10.47604/jhrl.1646

Okwako, W. (2020). Institutional barriers to ICT integration in teaching: A study of selected private universities in Kenya. *International Journal of Education and Development Using Information and Communication Technology, 16*(3), 80–98.

Owino, B. (2023). Adoption of e-learning in universities in Kenya and its effect during COVID-19 (Master's thesis). United States International University - Africa. USIU-Africa Repository.

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews**.** *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Parthe, R. (2023). Comparative analysis of data visualization tools: Power BI and Tableau. *International Journal of Scientific Research in Engineering and Management, 7*(7), 1–11. https://doi.org/10.55041/IJSREM26272

Philip, J., & Nyakerario, F. (2023). Blended learning: Threats and hurdles in developing countries—A case study of Nigeria and Kenya. *Greener Journal of Social Sciences, 13*(1), 151–158. https://doi.org/10.15580/gjss.2023.1.112024176

Prabowo, H., & Bandur, A. (2022). Digital transformation in higher education: Global trends and future research directions. *Journal of Innovation in Business and Economics, 5*(2), 77–90. https://doi.org/10.22219/jibe.v5i02.21218

Prinsloo, P., & Kaliisa, R. (2022). Learning analytics on the African continent: An emerging research focus and practice. *Journal of Learning Analytics, 9*(2), 1–12.

Santiago Rivera, D., & Shanks, G. (2015). A dashboard to support management of business analytics capabilities. *Journal of Decision Systems, 24*(1), 73–86.

Selwyn, N., Henderson, M., & Chao, S.-H. (2016). 'You need a system': Exploring the role of data in the administration of university students and courses. *Journal of Further and Higher Education, 42*(5), 1–11. https://doi.org/10.1080/0309877X.2016.1206852

Shete, S., Koshti, P., & Pujari, V. (2024). The impact of AI-powered personalization on academic performance of students. In *2024 International Conference on Recent Trends in Computational Science and Technology (ICRTCST)* (pp. 295–301). IEEE. https://doi.org/10.1109/ICRTCST61793.2024.10578480

Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review, 46*(5), 30–32.

Sithumini, J. H. C., Sanjuka, A. N. E., Ranawaka, P. S., Hasaranga, H. G. D., Samarakkody, T., & Pathirana, G. (2024). Systematic review: The role of data analytics in enhancing academic performance, classroom interaction, and learning analytics in higher education. In *Proceedings of the 3rd International Conference on Sustainable & Digital Business (ICSDB 2024)* (p. 168).

Smith, A. (2017). Theological barriers to innovation in faith-based institutions. *Christian Higher Education, 16*(1–2), 90–105.

Stojanov, A., & Daniel, B. K. (2024). A decade of research into the application of big data and analytics in higher education: A systematic review of the literature. *Education and Information Technologies, 29*, 5807–5831. https://doi.org/10.1007/s10639-023-12033-8

The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. (2021). *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Licensed Under Creative Commons Attribution (CC BY-NC)

Tsai, Y. S., Poquet, O., Gašević, D., Dawson, S., & Pardo, A. (2020). Complexity leadership in learning analytics: Drivers, challenges, and opportunities. *British Journal of Educational Technology, 51*(6), 1339–1354.

UNESCO. (2021). *Digital transformation of education: Systemic approaches for developing digital education policies*. UNESCO Publishing.

UNESCO. (2022). *Using learning assessment data for educational planning: A resource for Sub-Saharan Africa*. UNESCO Digital Library. https://unesdoc.unesco.org/ark:/48223/pf0000382621

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478.

Wekesa, M., Ikoha, A., & Wechuli, A. (2023). Readiness for adoption of learning analytics to support technology-enabled learning in universities in Kenya. *International Journal of Innovative Science and Research Technology, 8*, 1254.

Wilbrod, M., Joshua, T., & Research Repository Extension, A. I. U. (2024). Data-driven approaches to enhancing student retention in higher education: A case study of Avance International University. *International Journal of Higher Education, 10*(2), 43–51.

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Extent to which self-regulation behavior influences student online learning outcomes in public universities of Western region, Kenya

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ABSTRACT

Higher education institutions are undergoing radical transformations driven by the need to digitalize education and training processes rapidly. Universities continue to prioritize online learning as a means of meeting the diverse needs of students, ensuring accessibility, flexibility, and continuity in education. However, for students to effectively benefit from online learning, two crucial constructs play a pivotal role: academic motivation and self-regulation. These factors significantly influence students' ability to engage with, persist in, and succeed in online learning environment. Despite the growing emphasis on online education, many students in public universities in the Western region of Kenya face challenges related to self-discipline which affect their learning outcomes. The purpose of this study was to assess the impact of self-regulation strategies on students' online learning outcomes. This study was guided by self-regulation theory. A mixed-methods research design was employed, targeting 4,551 respondents, comprising 4,475 undergraduate students from the Department of Education, 24 heads of the Education Department, 39 instructors, and 4 ODEL administrators. Data was collected using questionnaires and key informant interview schedules. A pilot study was conducted to ensure reliability, with Cronbach's alpha used to test the internal consistency of research instruments. Face, content, and criterion validity of the instruments were ascertained. Data analysis involved correlation to assess relationships between variables and multiple regression to predict their interactions. The qualitative results from the interview showed that self-regulation influences students' online learning outcomes in public universities within this region. The results showed a strong positive relationship (correlation coefficients of 0.821, respectively) between students' online learning outcomes and self-regulation behavior. According to linear regression analysis, students' online learning results were positively and significantly impacted by self-regulation behavior (regression coefficients of 1.271, respectively) The study found that self-regulation explained around 55.2% of the variance in students' online learning results. For education stakeholders, these findings have important ramifications, especially when evaluating readiness for the competency-based curriculum (CBC) in Kenya by 2026, which includes the use of online learning techniques. The Teachers Service Commission (TSC), Kenya Institute of Curriculum Development (KICD), and Ministry of Education (MOE) may utilize these findings to create efficient teacher training plans for online instruction and to address challenges hindering the adoption of online learning. Enhancing students' academic motivation and self-control will be key to a successful digital learning experience.

Keywords: Public Universities, Self-Regulation Behavior, Student Online Learning Outcomes, Western Region, Kenya

I. INTRODUCTION

Higher education institutions are undergoing radical transformations driven by the need to digitalize education and training processes in record time with academics that lack innate technological capabilities for online teaching (Aheto et al., 2021). Universities are required to strive to overcome this situation to be competitive and provide high-quality education during times of rapid digital transformation, disruptive technological innovations, and accelerated change especially due pandemics such as Covid-19 (Weyage, 2023). The measure to curb Covid-19 demanded restricted physical gathering in learning environments and this paved way for online learning systems in universities (Bundi, 2024).

Higher learning institutions adopted e-learning systems to corroborate students and faculty's experiences during the COVID-19 pandemic. In a matter of weeks, entire education systems from elementary to higher education had completely adjusted to online teaching and learning (Ndwiga et al., 2024). The switch to online learning left many universities grappling academic achievement of students. Operationalized academic achievement as online learning outcomes measured by the constructs of frequency of attending online classes, taking exams, giving feedback and finally examined an analysis of results of online assessments (Mishra & Koehler, 2006).

According to United Nations Environmental, Scientific and Cultural Organization [UNESCO], Higher Education Institutions (HEIs) were closed completely in 185 countries in April 2020, affecting more than 1,000 million

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learners around the globe ((Marinoni et al., 2020). The reality of the new normal caused by COVID effects, led to a radical transformation of education and training such as digital transformation in global higher education (Dwivedi et al., 2011). E-learning took over once in-person instruction was abruptly and forcibly discontinued. This pressure led to sudden pressure to quickly adjust to fully online learning environments (Carolan et al., 2020). Universities had to consider how to deliver high-quality education in the face of disruptive technological innovation, digital transformation, and rapid changes to the educational system. Many colleges struggled with disruptive educational innovation, which opened up new learning options and supplanted established teaching strategies and methods.

A review of related studies from the United Kingdom and others from Asia (Wei & Chou, 2020; Cheng, 2011; Irfan, 2019; Petrus et al., 2016) indicated that even in the developed world, e-learning still had challenges from (Klimova et al., 2022). The importance of learning outcomes based on online learning was emphasized by the studies covered in the brief. Therefore, using a case study of four public universities in the western region of Kenya, this study examined academic motivation and self-regulation as determinants of students' online learning outcomes.

Colleges and universities around the world have mostly embraced virtual lessons and Open and Distance e-learning (ODeL) by providing online courses. However, this was not the case in many public elementary and secondary schools, where classroom interactions between teachers and students were the preferred method of instruction. Kibuku et al. (2020) presented some of the challenges such as: lack of adequate e-Learning policies, inadequate Information and Communication Technology (ICT) infrastructure, the ever evolving technologies, lack of technical and pedagogical competencies and training for e-tutors and e-learners, lack of an e-Learning theory to underpin the e-Learning practice, budgetary constraints and sustainability issues, negative perceptions towards e-Learning, quality issues, domination of e-Learning aims by technology and market forces and lack of collaboration among the e-Learning participants. Studies reviewed indicated challenges but it's not clear whether they emanated from students, lecturers or systemic ones (Wakanyi, 2023).

According to Cassidy (2011), the general influences of self-regulated on learning is student knowledge about themselves, the subject area, the task, strategies for learning and the context in which they will apply learning. Other influence is intrinsic motivation to learn where students value learning and not just performance (Cassidy, 2011). Universities are still unable to find the link between motivation and online learning. The current study aims to ascertain the relationship between academic motivation, self-regulation, and learning outcomes.

1.1 Statement of the Problem

The framework of Kenya's Vision 2030 required universities to introduce self-based learning as a method for teachers to interact with students and increase accessibility to education (Amukune, 2022). The COVID-19 pandemic, however, greatly expedited the transition to online learning., which necessitated the abrupt transition to digital learning platforms. Universities had to rapidly adopt technological solutions, including Learning Management Systems (LMS), video conferencing tools, and other e-learning resources to ensure continuity in education (Kariuki et al., 2024). While this transition aimed at sustaining academic progress, it posed significant challenges, particularly for students and educators who were unprepared for such a sudden digital shift. Local studies highlighted several challenges encountered during this transition. For instance, infrastructure limitations, lack of digital literacy among both students and faculty, and internet accessibility issues were prevalent (Amukune, 2022). Additionally, student-related factors such as motivation and self-regulation played a crucial role in their ability to successfully adapt to online learning environments. Despite being digital natives, many students struggled to stay engaged in online learning due to inadequate self-discipline, low intrinsic motivation, and difficulties in managing their own learning processes (Ferrandino, 2021). According to Ferrandino's survey of 2,742 university students, 31.4% (862 students) had to retake their online exams, while 16% consistently performed poorly despite multiple attempts. Furthermore, 48% were unprepared to undertake online assessments due to challenges in interacting with digital tools effectively. Previous research have largely focused on technological and accessibility issues, with little emphasis paid to the psychological aspects of academic motivation and self-regulation as significant markers of online learning effectiveness. Examining the extent to which public university students have the self-control and drive required to thrive in online learning settings was essential in light of Vision 2030's mission to modernize education and improve the educational experience. Students may continue to experience difficulties with engagement and performance if these psychological aspects are not fully recognized and handled, undermining Vision 2030's goals of building a strong, cutting-edge educational system. Therefore, This study investigated the relationship between students' self-control and the results of online learning at public universities in Western Kenya.

1.2 Research Objectives

To ascertain the extent to which Self-regulation behavior influences student online learning outcomes in Public Universities of Western region, Kenya.

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1.3 Research Hypothesis

HO₁: Students' Self-regulation strategies have no influence on their online learning outcomes in Public Universities of Western region, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Self-Regulation Theory

Self-Regulation Theory (SRT) was initially proposed by Albert Bandura in 1986 as part of his broader work on social cognitive theory. The theory posits that individuals actively regulate their thoughts, emotions, and behaviors in pursuit of set goals. Self-regulation involves multiple constructs, including goal setting, self-monitoring, self-efficacy, self-control, and self-reflection. These constructs collectively influence an individual's ability to manage their learning processes effectively.

According to the study, self-regulation is especially important in an online learning setting because students are required to individually manage their time, motivation, and study techniques. In order to succeed academically in online learning, students must demonstrate greater degrees of self-discipline and intrinsic drive than in traditional classroom settings. Thus, in virtual learning environments, self-regulation is a key indicator of students' academic achievement.

These are some ways that the SRT structures match the study variables. The ability of students to observe and modify their emotions, behaviors, and cognitive methods in order to improve learning outcomes is known as self-regulation. Students' perseverance and involvement in online learning activities are influenced by motivation, a crucial factor in determining self-regulatory behaviors. Academic outcome, the study's dependent variable, is affected by students' levels of motivation and self-control.

The relationship between the dependent variable (online learning outcomes) and the independent factors (academic motivation and self-regulation) is explained by the hypothesis. In particular, motivated and involved students are more likely to perform well academically in online learning when they have excellent self-regulation abilities.

However, Self-Regulation Theory has some limitations when applied to this study. One major limitation is the assumption that individuals have complete control over their learning behaviors and outcomes. In an online learning environment, external factors such as internet connectivity, institutional support, and technological proficiency also play a significant role, which the theory does not fully address. Furthermore, SRT primarily focuses on motivation as a central construct but does not comprehensively explain other external influences on academic performance.

2.2 Empirical Review

2.2.1 Online Learning During the Pandemic Period

Early in 2020, the COVID-19 epidemic broke out over the world, upending established educational systems and forcing a swift switch to online schooling. To maintain educational continuity, higher education institutions including public universities in Kenya's western region adopted a variety of online learning approaches and platforms. Throughout the pandemic, universities both locally and abroad supported online learning using a range of digital communication technologies and learning management systems (LMS). Among the most popular platforms were learning management systems, video conferencing tools, content delivery systems, and institutional e-learning portals.In order to guarantee good engagement and learning results, each of these platforms needed learners to have particular abilities and attributes. There are now a number of online learning methods that require different qualities of learners to succeed (Kisanjara et al., 2017). Online learning has many benefits, but students still have to deal with concerns including the digital divide, poor internet access, inadequate study spaces, and trouble adjusting to self-paced learning. Various solutions were put in place by universities to address these issues, including recorded lectures, subsidized data bundles, and hybrid learning techniques. The pademic-related transition to online learning showed the importance academic motivation and self-control are to students' performance in online learning contexts (Matuga, 2009).

2.2.2 Influence of Self-Regulation Behavior on Students Online Learning Outcomes

Self-regulated learning is distinct from cognitive ability or academic achievement. Rather, it describes a self-guided method via which students convert their cognitive capacities into academic proficiencies relevant to a certain topic. Generally speaking, a student's self-regulated learning is influenced by their self-awareness, the task, the subject matter, their learning strategies, and the environment in which they apply their learning. Because students are inherently motivated, value learning above achievement, and take charge of their education rather than relying on outside influences, learning motivation is also essential. Willpower, or volition, is another essential element of self-regulated learning, according to Kisanjara et al. (2017).

In higher education, the concept of self-regulated learning is becoming increasingly relevant due to the unique challenges that students encounter (Cassidy, 2011). Self-regulated learning has been emphasized by several theoretical

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stances, and it is generally accepted that students' views of themselves as learners are crucial to this process. This study examined the psychological ideas of self-regulation and motivation in relation to online learning outcomes.

Matuga (2009) examined the academic achievement, self-control, and goal orientation of 40 second-year US university science students enrolled in online courses. The purpose of the study was to look at how changes in goal orientation and self-regulation connect to academic success. This study was quasi-experimental and used a pretest-posttest paradigm. The target market consisted of secondary school students who were enrolled in six-week online university courses taught by a two-person team made up of a secondary classroom teacher and a university science professor. Self-report questionnaires were used to gather the data, and inferential statistics like regression analysis and correlation were used to assess the findings.

According to Cassidy (2011), self-regulated learning is becoming increasingly significant in higher education because of the unique expectations imposed on college students. With a focus on learning style, academic control beliefs, and student self-evaluation, the study sought to investigate the fundamental ideas of self-regulated learning. Multiple regression and factor analysis were used to evaluate the data, and descriptive survey research was used to recruit university students for the study.

The study found that by assisting students in creating efficient learning techniques, self-regulated learning improves academic attainment. In order to promote student autonomy and academic achievement, it suggested introducing self-regulated learning components into university courses. This study investigated the function of self-regulated learning in online learning among Kenyan university students, in relation to Cassidy's (2011) study, which concentrated on self-regulated learning in conventional higher education settings. This study also looked at other aspects such student involvement, cognitive performance anticipation, and institutional support, whereas Cassidy focused on learning styles and academic control views.

Kisanjara et al. (2017) developed an integrated model for evaluating e-learning’s impact on student achievement in Tanzanian universities. The study examined various factors, including student involvement, expectations for cognitive performance, student autonomy, contentment, pleasure, self-worth, and trust in online learning platforms. Utilizing surveys and statistical modeling methods like structural equation modeling (SEM) to examine correlations between variables, a quantitative study design was used. The results showed that pupils' academic performance was greatly impacted by these factors. According to the study, self-regulated learning techniques should be encouraged and institutional support for e-learning platforms should be strengthened.

Nduta (2019) investigated the relationship between academic achievement, self-regulated learning, and academic motivation in secondary school. The study's theoretical framework was based on self-determination theory and social cognitive theory. Secondary school students' questionnaire responses were gathered using a correlational study approach, and the results were analyzed using multiple regression models. Academic achievement, self-regulated learning, and academic motivation were found to be significantly correlated. The innate drive for achievement was the most significant predictor of academic accomplishment among all the elements of academic motivation. The study discovered that academic motivation and self-regulation differed by gender, with male students being favored. It suggested that in order to improve student success, schools should encourage academic motivation and self-regulated methods of learning.

Nduta (2019) investigated secondary school pupils; this study concentrated on college students, who had more studying freedom. Unlike Mutwelele's study, which looked at academic accomplishment in general, this one looked exclusively at the results of online learning in public universities. Furthermore, by combining data from several sources, such as administrators, lecturers, and students, to triangulate results, Mutwelele's research was filled in. The reviewed studies highlighted various aspects of self-regulated learning, but gaps remained regarding its influence on online learning outcomes in Kenyan public universities.

III. METHODOLOGY

3.1 Research Design

The study adopted a mixed research design, incorporating both quantitative and qualitative approaches to provide a comprehensive understanding of how academic motivation and self-regulation predict students’ online learning outcomes in public universities of the Western region of Kenya. Quantitative data were collected using closed-ended questionnaires to generate measurable and statistically analyzable responses on students' levels of motivation, self-regulatory behavior, and academic performance (Creswell & Clark, 2018). Complementing this, qualitative data were gathered through scheduled interviews, which offered deeper insights into students’ personal experiences, contextual challenges, and perceptions related to online learning. This combination of methods allowed for both breadth and depth in data collection, enabling the researcher to validate and enrich the quantitative findings with qualitative perspectives (Dawadi et al., 2021).

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3.2 Target Population

The study focused on the 4551 respondents comprising of undergraduate students from the school of education and social sciences in all the public universities in Western region of Kenya (2317 students from MMUST, 1110 from KIBU, 587 from KAFU and 461 from Alupe totaling 4475 undergraduate students). The target population comprised of 24 heads of education department, 39 instructors of the departments, and 4 ODEL administrators.

3.3 Sampling Techniques and Sample Size

Sampling involves making of conclusions about an entire population using a subset of the population (Orodho, 2009). The respondents were undergraduate students, instructors, and ODEL administrators of public Universities in Western region, Kenya.

The study used public Universities in Western region of Kenya as the study unit as justified in the study area. The researcher further purposively sampled out the school of education in each of the universities as the researcher established that this was the only school across the four universities that had similar courses to ensure uniformity of the study. The researcher further purposively sampled only the courses that will have online learning during the study duration. This therefore meant that the students in the sampled courses and the respective instructors formed the respondents' base in the study. This information was sourced from the undergraduate students, departmental heads, instructors and ODEL administrators.

367 undergraduate students were selected by purposive sampling based on the nature of their academic programs, specifically targeting those enrolled in courses that had actively incorporated online learning platforms and virtual instruction. This technique was specifically chosen to guarantee that only students who had regular and pertinent experience with online learning environments were included in the study. This was because they were in the best position to offer knowledgeable insights on how academic motivation and self-regulation affect online learning outcomes. Individual students from each course were chosen using simple random sampling after the pertinent courses within the four chosen universities were determined. By giving every eligible student in the targeted courses an equal chance of being included in the study, this probability sampling strategy was used to minimize sampling bias and improve the findings' generalizability within the sampled population.

Census sampling involves collecting data from every individual within a specified population, making it an ideal method when the population size is small and manageable. In this study, census sampling was the most appropriate method for selecting the 24 heads of education departments, 39 instructors, and 13 ODEL administrators because it ensured that every key stakeholder involved in online education within the public universities in the Western region of Kenya is included. This approach guaranteed comprehensive and accurate data, as it captured all perspectives without the risk of omission that might occur with other sampling methods (Verma et al., 2024).

3.4 Research Instruments

Interviews and questionnaires were used as the main instruments of study. Data from key university respondents was collected using these methods.

Questionnaire: The researcher issued the students with questionnaires because of ease of administration through course instructors: Time and money was saved as the number of students is quite high. Section A of the questionnaire established students' demographics. Section B sought to find out self-regulation strategies adopted by the student. The student selected the method she or he has adopted to regulate self. Section C established academic motivation on learning, Section D examined the relationship between academic achievement, self-regulation, and online learning outcomes. In order to assess students' learning outcomes, the study suggests modifying Bloom's taxonomy of learning outcomes domains to include both positive and negative items distributed among three domains (cognitive, emotional, and psychomotor). According to Creswell & Creswell (2017), the response responses for these items were on a four-point Likert scale: "Strongly Disagree" (SD = 1), "Disagree" (D = 2), "Agree" (A = 3), and "Strongly Agree." By adapting McClelland's overviews into 15 positive statements that were distributed over.

Key Informant Interview Guides: An in-person interview was used in this study because they gave in-depth information on the subject being studied (Best & Kahn, 2011). This method contributed to collection of qualitative data. An interview with a subject matter expert can give one meaningful insights that a generalized public source won't be able to provide (Best & Kahn, 2011). Interviews were carried out in person or on telephone. They had open-ended questions to get meaningful information about the topic. The interviews were administered to 24 heads of department, 39 departmental Instructors and 4 ODEL administrators because they handled the learners on a day-to-day basis as the online classes went on. The interviews established self-regulation strategies adopted by the students, the influence of academic motivation on learning, and the relationship between self-regulation, academic achievement and online learning outcomes of public Universities in Western region, Kenya.

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3.5 Validity of Research Instruments

The validity of the research instruments in this study, which examined academic motivation and self-regulation as predictors of students' online learning outcomes in public universities of the Western region of Kenya, was assessed through expert analysis to ensure accuracy and relevance (Mugenda & Mugenda, 2003). Subject matter experts in educational psychology, online learning, and research methodology were consulted to evaluate the content validity of the instruments. These experts reviewed each item to ensure it appropriately represented the theoretical constructs of academic motivation, self-regulation, and learning outcomes, and confirmed that the items were clear, culturally appropriate, and aligned with the study's objectives. Their feedback was used to refine the instruments by eliminating or modifying ambiguous or irrelevant items. This expert validation process enhanced the content and face validity of the instruments, ensuring that that the tools measured what they were supposed to measure within the specific context of Kenyan public universities (Kothari, 2019).

3.6 Reliability of Research Instruments

The reliability of the research instruments in this study referred to the consistency and stability of the measurements of academic motivation, self-regulation, and online learning outcomes among students in public universities in the Western region of Kenya (Mugenda & Mugenda, 2003). To ensure reliability, the instruments were pilot-tested on a representative sample to identify any ambiguities or inconsistencies in the items. Internal consistency was measured using Cronbach's alpha coefficient, with acceptable values (typically above 0.7) indicating that the items within each construct reliably measured the same underlying concept. Test-retest reliability may also have been employed to assess the stability of the instruments over time. The findings from these reliability tests ensured that the data collected were dependable and could be replicated in similar educational contexts.

3.7 Data Collection Procedure

The researcher will physically distribute the questionnaires to selected students in public universities within the Western region of Kenya, ensuring that each participant receives clear instructions on how to complete the tool. A period of two weeks will be allowed for participants to fill out the questionnaires at their convenience, providing sufficient time for thoughtful and accurate responses. During this period, the researcher will conduct follow-up visits and reminders to encourage timely completion and maximize the response rate. In addition to the questionnaires, interviews will be conducted with a purposively selected group of participants to gather more detailed qualitative data on academic motivation, self-regulation, and online learning outcomes. All data collection activities will be carried out in adherence to ethical standards, ensuring voluntary participation, confidentiality, and respect for the respondents' time and autonomy.

3.8 Data Analysis

This study used a mixed methods approach - two different kinds of data were examined. Statistics which were both descriptive and inferential were generated.

Quantitative Data Analysis: Before the qualitative data was loaded into SPSS version 27 for analysis, it was cleaned, sorted, and coded to guarantee correctness and consistency using the 5-point Likert scale questionnaires. To draw attention to and condense the key features of the data, descriptive statistics were used. Frequencies and percentages were calculated to show how responses were distributed and to uncover trends and patterns among students in relation to academic motivation, self-regulation, and online learning outcomes. The mean and standard deviation, which assessed the central tendency and variability of the responses, were computed to provide a more thorough picture of the students' overall experiences.

Inferential statistics were used to look at how the variables related to one another. The degree and direction of the connections among academic motivation, self-regulation, and online learning outcomes were assessed using Pearson product-moment correlation. This approach shed light on the degree of correlation between these variables as well as whether better learning outcomes were linked to higher levels of motivation and self-regulation. Understanding the cumulative impact of these factors on online learning achievement required knowing how much each of them influenced the others, which was made possible by the correlation analysis.

In addition, ANOVA (Analysis of Variance) was conducted to test whether significant differences existed in online learning outcomes based on varying levels of self-regulation and academic motivation. This analysis allowed for comparisons between different groups of students, showing whether those with higher self-regulation or motivation performed better in online learning environments. To further predict the impact of these independent variables on online learning outcomes, linear regression analysis was applied. This statistical technique helped estimate how much of the variation in learning outcomes could be explained by self-regulation and academic motivation. The Model Summary in SPSS provided a measure of how well the regression model fit the data, indicating the predictive power of these factors on students' online learning performance.

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Qualitative Data Analysis: The qualitative data collected through interviews was analyzed using thematic analysis, a method that allows for identifying, analyzing, and reporting patterns or themes within the data. The process began with transcribing the interviews, followed by familiarizing the researcher with the data by reading through the responses several times. Initial codes were generated based on recurring ideas or concepts mentioned by the participants, such as challenges in online learning, motivational factors, and self-regulation strategies. These codes were then grouped into broader themes that reflected the underlying meanings and experiences of students regarding online learning outcomes. Thematic analysis provided a rich, detailed understanding of how students perceived their academic motivation and self-regulation in the context of online learning.

Triangulation was employed to ensure the credibility and validity of the findings by cross-checking the qualitative data with the quantitative results. The researchers compared the themes identified through the interview analysis with the quantitative data obtained from the questionnaires. For instance, themes related to self-regulation and motivation were compared with the quantitative measures of these variables to identify areas of convergence or divergence. This process helped to confirm the consistency of the findings across different data sources, reinforcing the reliability of the conclusions drawn from both the qualitative and quantitative data. By combining both data types, triangulation ensured a more comprehensive and accurate understanding of how academic motivation and self-regulation influenced students' online learning outcomes.

IV. FINDINGS & DISCUSSIONS

4.1 Demographic Information

4.1.1 Gender of the Respondents

Respondents were asked to identify their gender. The results shown in Figure 1 indicate that 57.9% of the population was male and 42.1% was female.

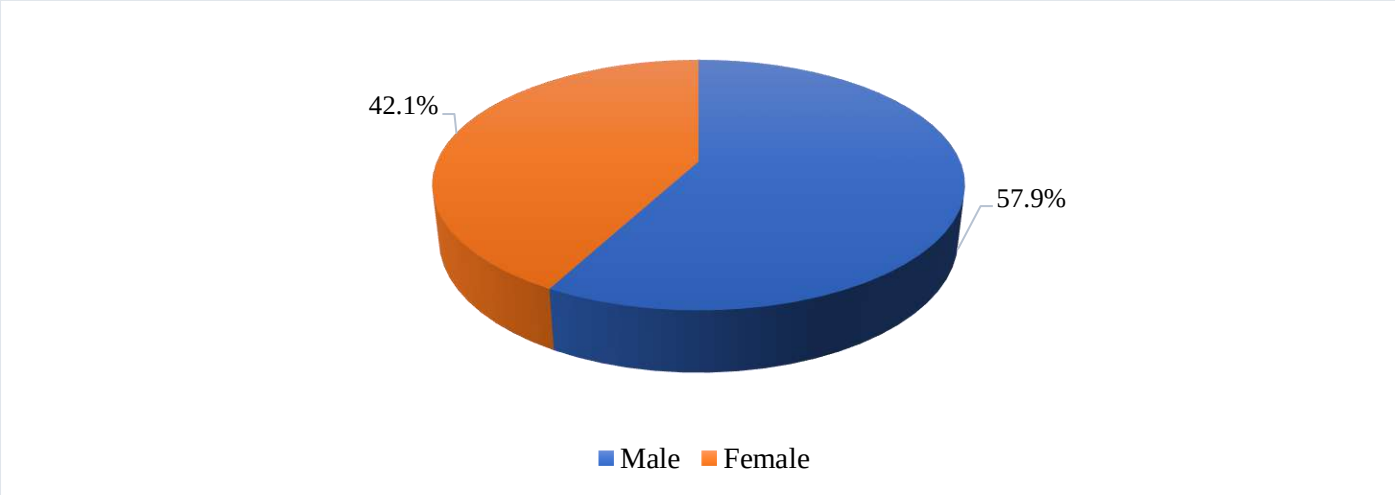

Figure 1
Gender of the Respondents

4.1.2 Age of the Participants

The respondents were asked to identify their age bracket. The findings in Table 1 shows that 54.0% were between 15-19 years, 33.2% were between 20-24 years and 12.8% were above 25 years.

Table 1
Age of the Participants

Age	Frequency	Percent
15-19 years	164	54.0
20-24 years	101	33.2
Above 25 years	39	12.8
Total	**304**	**100.0**

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4.1.3 Year Admitted

Respondents were asked to indicate the year they were admitted in Universities. The results in Table 4.3 shows that 20.1% were admitted in 2024/2025, 21.7% were admitted in 2023/2024, 24.3% were admitted in 2022/2023, 26.6% were admitted in 2021/2022 and 7.2% were admitted in 2020/2021 or earlier.

Table 2

Year Admitted

Year Admitted	**Frequency**	**Percent**
2024/2025	61	20.1
2023/2024	66	21.7
2022/2023	74	24.3
2021/2022	81	26.6
2020/2021 or earlier	22	7.2
Total	**304**	**100.0**

4.14. Previous Academic Performance

The aim of the study was to find out the respondents' previous levels of education. According to the findings in Figure 2, 16.8% of respondents performed below average, 36.2% performed average, 30.3% performed above average, and 16.8% performed very well.

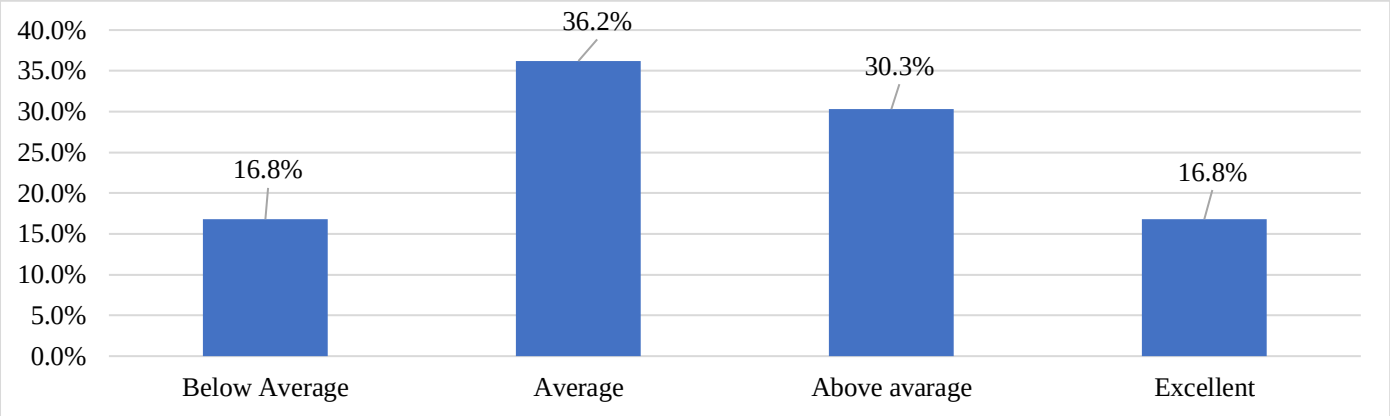

Figure 2

Previous Academic Performance

4.1.5 Access to Technology

Participants were asked on whether they have access to technology such as computer and smartphone. The results in Figure 3 shows that 56.9% had no access to technology while 43.1% had access to technology.

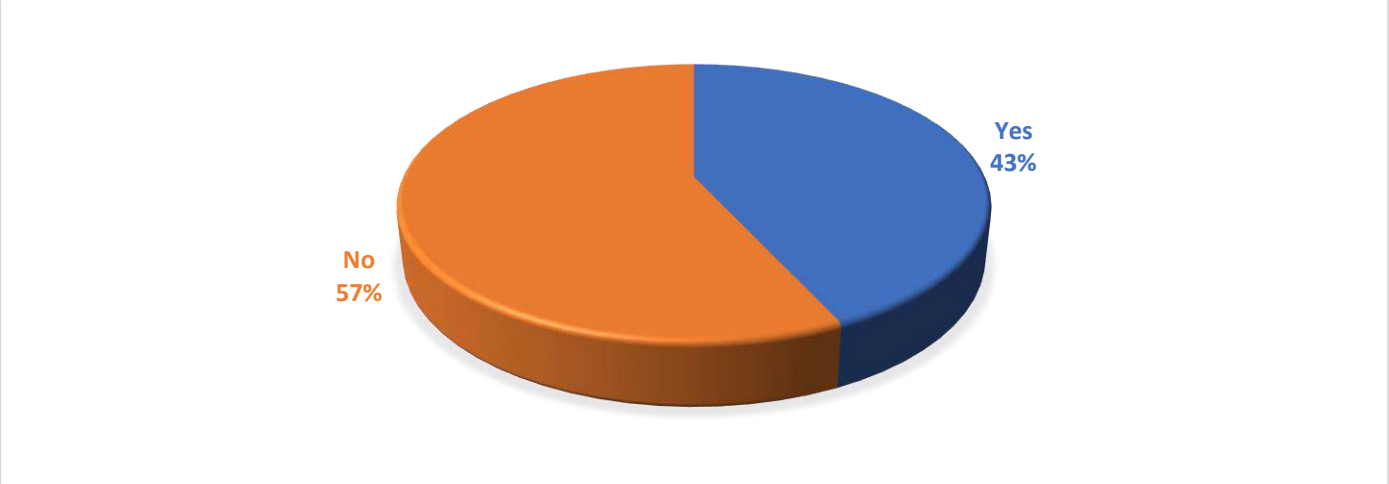

Figure 3

Access to Technology

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4.1.6 Self-regulation strategy

Participants were asked on whether they have self-regulation strategy. From the findings in Figure 4, 12.2% had no self-regulation strategy, 30.6% occasionally had self regulationstrategy,34.5% often had self-regulation strategy while 22.7% always had self-regulation strategy.

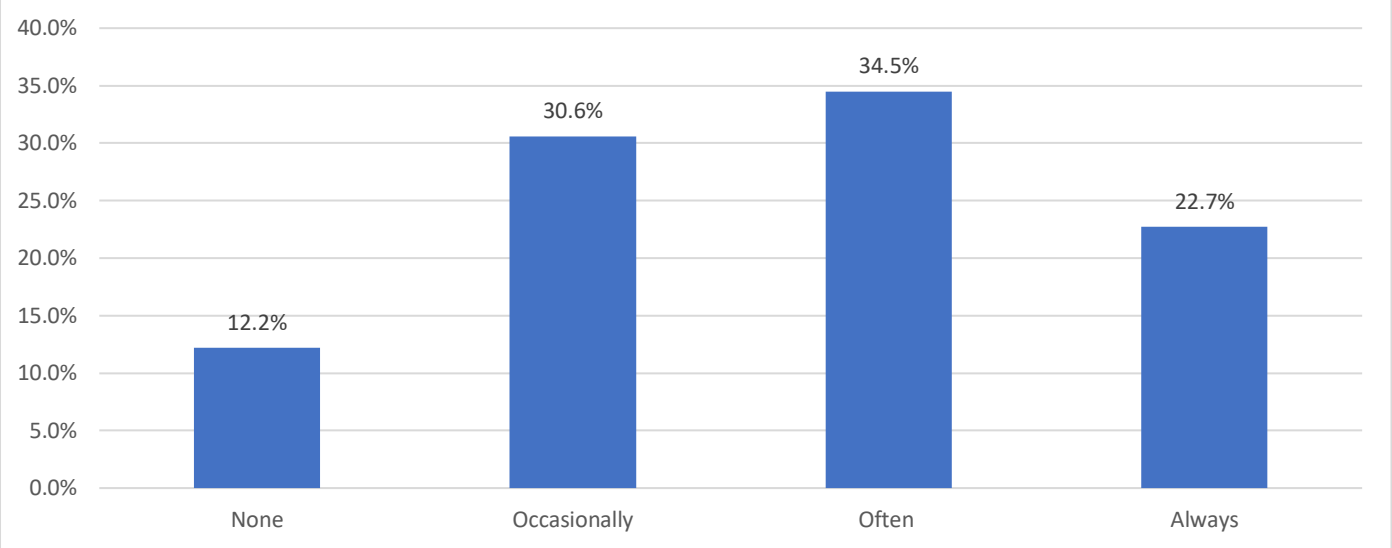

Figure 4
Self-Regulation Strategy

4.2 Descriptive Statistics

Respondents were asked to rate various statement with the aim of identifying the extent to which self-regulation behaviour influences student online learning outcomes. The results were presented in Table 3 below.

Table 3
Extent to which Self-Regulation Behavior Influences Student Online Learning Outcomes

No.	Statement	Percentages and frequencies					Mean	Std dev.
		1 SD	2 D	3 N	4 A	5 SA		
1.	I am able to fulfill my personal tasks and deadlines for online assignments	81 (26.6%)	89 (29.3%)	28 (9.2%)	61 (20.1%)	45 (14.8%)	2.67	1.432
2.	I effectively manage my time for attending online classes and studying	77 (25.3%)	88 (28.9%)	23 (7.6%)	61 (20.1%)	55 (18.1%)	2.77	1.476
3.	I persist in completing online coursework even when faced with challenges	63 (20.7%)	69 (22.7%)	16 (5.3%)	79 (26.0%)	77 (25.3%)	3.12	1.523
4.	I set personal deadlines that help me stay on track with my online coursework	65 (21.4%)	61 (20.1%)	18 (5.9%)	82 (27.0%)	78 (25.7%)	3.15	1.528
5.	I review and adjust my learning strategies if I find I am not making sufficient progress	56 (18.4%)	63 (20.7%)	21 (6.9%)	89 (29.3%)	75 (24.7%)	3.21	1.479
6.	Do you set specific goals for your online courses	1 Yes			2 No		1.64	0.707
		149 (49.1%)			155 (50.9)			
7.	How often do you create a study schedule for your online learning	Never	Occasionally	Sometimes	Frequently		2.64	0.999
		43 (14.1%)	97 (31.9%)	91 (29.9%)	73 (24.0%)			
8.	How satisfied are you with your ability to monitor your progress	Very dissatisfied	Dissatisfied	Satisfied	Very satisfied		2.32	1.059
		98 (32.2%)	93 (30.6%)	74 (24.3%)	39 (12.8%)			

The purpose of the study was to determine if students were able to complete their personal assignments and fulfill deadlines for their online assignments. The results showed that 26.6% strongly disagreed, 29.3% disagreed, 9.2% remained neutral, 20.1% agreed and 14.8% strongly agreed that they were able to fulfill their personal tasks and deadlines for online assignments. The results indicate that most students contended they were unable to meet their personal tasks and deadlines for online assignments, suggesting difficulties in self-regulation that may impede good online learning outcomes. Individuals who consented exhibited a degree of self-discipline and time management,

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essential for achieving academic objectives in a virtual environment. Neutral reactions indicate ambiguity or variability in self-regulatory behaviours. The average score of 2.67 and a standard deviation of 1.432 suggest a generally inadequate capacity to meet deadlines, accompanied by significant heterogeneity in students' self-regulation behaviours.

Respondents were asked about how well they manage their time so they can study and attend online programs. According to the results, 38.2% agreed and strongly agreed that they efficiently manage my time so that I may attend online classes and study, whereas 54.2% disagreed and strongly disagreed and 7.6% stayed neutral. The findings suggest significant difficulties with self-regulation that may have a negative impact on the outcomes of their online learning, as the majority of students did not think they were able to efficiently manage their time for attending online classes and studying. Those who gave their consent had effective time management skills, suggesting a higher likelihood of achieving positive academic outcomes. Indecisiveness or inconsistent time management techniques are suggested by neutral answers. The average score of 2.77 and a standard deviation of 1.476 suggest a typically low level of time management efficacy among students, accompanied by significant variability in their self-regulatory skills.

The results above were in line with interview responses obtained from heads of department where they were asked to state how students' self-regulation skills (such as time management and goal setting) affect their engagement and performance in online courses. HOD1 stated that;

> *"Effective time management and goal-setting skills significantly enhance students' engagement and performance by ensuring they meet deadlines and stay focused. Those lacking these skills often struggle with participation and fall behind in their coursework."*

The results were also supported by the responses obtained from ODEL1 who stated;

> *"Students often use planners, digital calendars, and reminders to manage their time. However, some struggle with procrastination due to competing priorities or lack of discipline. Those who successfully allocate time for learning activities tend to perform better in their coursework."*

The study intendent to find on whether respondents persist in completing online coursework even when faced with challenges. The findings shows that 43.4% disagreed, 5.3% were neutral and 51.3% agreed that they persist in completing online coursework even when faced with challenges. The results indicate that most students concurred that continue to complete online assignments despite encountering difficulties, demonstrating significant self-regulation and resilience, essential for achieving excellent online learning outcomes. Those who dissent exhibit a deficiency in perseverance, which may obstruct their capacity to attain academic objectives. Neutral answers indicate ambiguity or intermittent endurance amid adverse circumstances. The mean score of 3.12 and a standard deviation of 1.523 indicate a moderate degree of perseverance among students, accompanied by considerable diversity in their self-regulatory behaviour.

The aforementioned results were corroborated by McClelland and Atkinson's Need Achievement Theory, which highlights the importance of intrinsic motivation and perseverance in reaching objectives. According to this theory, people who have a high need for achievement are motivated to overcome obstacles, exhibiting resilience and self-control to achieve success; students who persevered in finishing online coursework in spite of difficulties exemplify this high achievement drive, demonstrating their dedication to academic goals; on the other hand, those who lack perseverance are associated with a lower need for achievement, which may impede their learning outcomes.

Respondents were asked on whether they set personal deadlines that help them stay on track with their online coursework. The outcomes show that 41.5% disagreed, 5.9% remained neutral, 52.7% agreed that they set personal deadlines that help me stay on track with my online coursework. The results indicate that most students concurred that they establish personal deadlines to maintain progress in their online coursework, reflecting proactive self-regulation behaviours that improve task management and lead to superior online learning outcomes. Individuals who dissent may encounter difficulties with time management and self-discipline, perhaps impeding their academic advancement. Neutral responses indicate inconsistency or ambiguity in employing deadlines as a self-regulation tactic. The mean score of 3.15 and a standard deviation of 1.528 suggest a moderate inclination to establish personal deadlines, accompanied by significant heterogeneity across students.

The findings are in accordance with those of Matuga (2009), who discovered that self-regulation, including setting personal deadlines, significantly enhances academic success. According to Matuga, goal-oriented behaviors improve time management and job completion, which is crucial for online learning because independence is essential. 52.7% of students agreed, according to your research, that using deadlines to stay on course shows proactive self-regulation. However, the answer variability shows that students' levels of self-discipline vary, with a mean of 3.15 and a standard deviation of 1.528.

The research sought to find on whether participants review and adjust their learning strategies if they find they are not making sufficient progress. The results show that 18.4% strongly disagreed, 20.7% disagreed, 6.9% remained neutral, 29.3% agreed and 24.7% strongly agreed that they review and adjust their learning strategies if they find they are not making sufficient progress. The results indicate that most students concurred that modify their learning tactics when progress is inadequate, demonstrating robust self-regulation skills that facilitate adaptive learning and enhance

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online learning outcomes. Individuals who disagreed may exhibit inflexibility in their learning methodologies, which could hinder their capacity to surmount obstacles. Neutral replies indicate ambiguity or variable approaches in strategic modification. The mean score of 3.21 and a standard deviation of 1.479 indicate a modest degree of flexibility, accompanied by considerable heterogeneity in students' self-regulatory behaviours.

Respondents were asked on whether they set specific goals for their online courses. The findings showed that 49.1% set specific goals for online courses while 50.1% of the respondents do not set specific goals for online courses. The findings indicate that although some students establish specific goals for their online courses, demonstrating a proactive self-regulation approach that can enhance their learning outcomes, a marginally larger segment fails to set such goals, suggesting a possible deficiency in their self-regulation practices. The mean of 1.64 indicates a tendency towards not establishing precise goals, while the standard deviation of 0.707 reflects significant diversity in the replies. This suggests that self-regulation behaviours vary among students, potentially hindering their capacity to attain optimal learning results.

The above findings were supported by the findings from interview where lecturers were asked to state specific self-regulation behaviors they have observed in students that seem to impact their online learning outcomes. Lecturer1 stated that

> *"Many students exhibit behaviors such as setting specific goals, creating schedules, and prioritizing tasks, which positively impact their online learning outcomes. Conversely, a lack of discipline and procrastination often result in poor performance and incomplete tasks."*

Respondents were asked on how often they create a study schedule for their online learning. The results showed that 14.1% never create a study schedule for your online learning, 31.9% occasionally create, 29.9% sometimes create and 24.0% frequently create a study schedule for their online learning. The results indicate that students exhibit differing degrees of self-regulation in designing study regimens for their online education. Individuals who do not establish plans may lack the requisite planning abilities for successful time management, whereas those who sporadically generate schedules exhibit inconsistent self-regulation that may impede prolonged academic achievement. Students who regularly formulate schedules demonstrate robust self-regulation, which likely results in improved learning outcomes. The mean of 2.64 indicates that the majority of students engage in schedule creation between occasionally and sometimes, while the standard deviation of 0.999 reflects considerable variety in self-regulation activities among the respondents.

Respondents were asked to state how satisfied they are with their ability of monitoring their progress. The outcomes shows that 32.2% are very dissatisfied, 24.3% are dissatisfied, 24.3% are satisfied, 12.8% were very satisfied. The results indicate that a considerable number of students express dissatisfaction with their capacity to track their progress, suggesting inadequate self-regulation skills that could adversely affect their online learning results. In contrast, individuals who are satisfied or highly satisfied exhibit enhanced self-monitoring abilities, which are crucial for monitoring and attaining learning objectives. The mean of 2.32 suggests that the majority of students exhibit dissatisfaction, while the standard deviation of 1.059 indicates significant variability in satisfaction levels, underscoring the differing self-regulation abilities among the respondents.

The aforementioned results were corroborated by the Self-Regulation Theory, which emphasizes the significance of people's capacity to track and assess their progress towards objectives. This idea holds that self-monitoring is an essential part of good self-regulation, allowing students to spot weaknesses and modify their approach to perform better. While satisfied students exhibit higher self-regulatory skills—which are crucial for tracking progress and reaching targeted learning outcomes dissatisfied students may find it difficult to match their actions with academic objectives.

Respondents were asked to state on whether they seek help from peers or instructors when faced with challenges on their online studies. The findings indicate that certain students proactively seek assistance from peers or instructors when encountering challenges, thereby employing a self-regulation strategy that can improve their online learning outcomes. Conversely, others refrain from seeking help, which may hinder their capacity to surmount difficulties and achieve academic success. This indicates that self-regulation behaviours, such as soliciting help, are not consistently employed, potentially leading to disparate academic achievement levels among students in online learning contexts.

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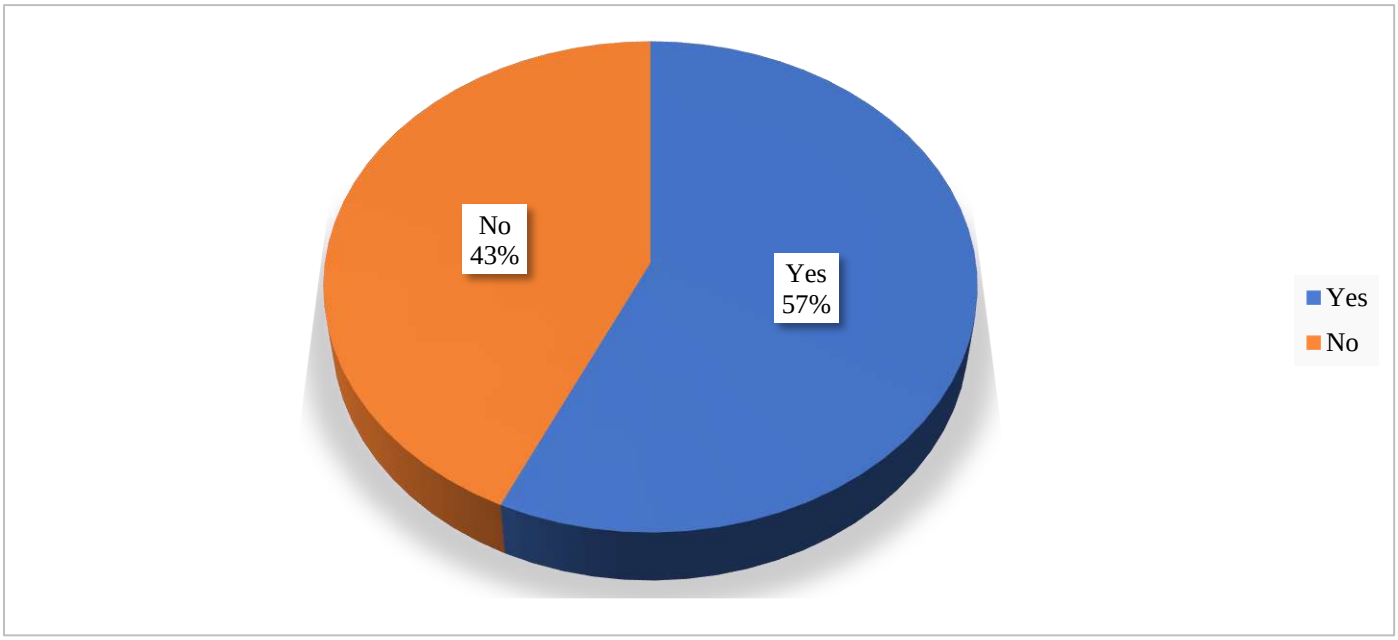

Figure 5
Seek help from Peers or Instructors

The aforementioned results concurred with those of Nduta (2019), who carried out research to ascertain the function of self-regulated learning and academic motivation as predictors of academic success. According to the study, adolescents who actively used self-regulation techniques like asking for assistance from teachers or peers performed better academically. On the other hand, pupils who did not employ these tactics frequently found it difficult to overcome obstacles, which led to poorer academic achievement. This emphasizes how important self-regulation is to improving learning results.

Respondents were asked on whether they eliminate distractions when studying online. The results shows that 57.9% eliminate distractions while 42.1% do not eliminate distractions when studying online. The outcomes indicate that most students effectively remove distractions while studying online, demonstrating robust self-regulation that can enhance their learning outcomes. Conversely, students who fail to minimize distractions may encounter difficulties in sustaining focus, thus impairing their online learning effectiveness. This indicates that proficient self-regulation, including the reduction of distractions, is essential for enhancing students' concentration and success in online learning settings.

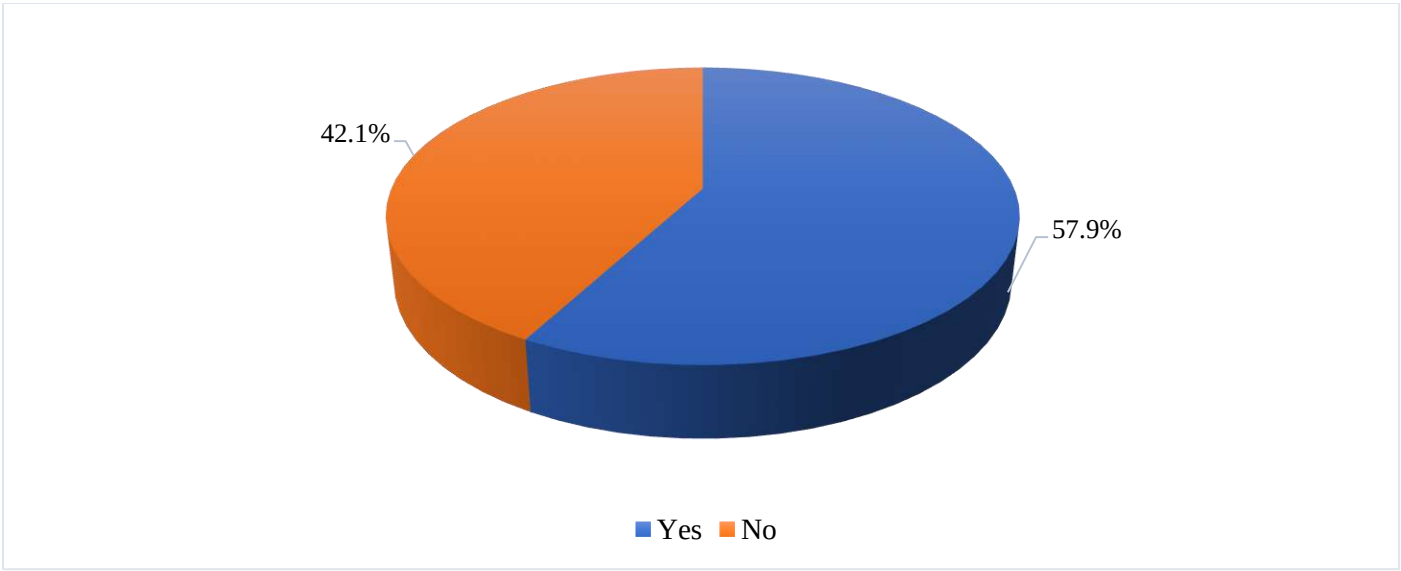

Figure 6
Eliminate Distractions

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The above findings were supported by the interview response obtained from Odel facilitators when they were asked about the challenges that students face in staying focused on their online learning tasks. One of the ODEL2 stated that;

"Distractions from social media, household responsibilities, and poor internet connectivity are common challenges. Additionally, the lack of physical interaction with peers and instructors reduces engagement, making it harder for students to stay focused during online sessions."

4.3 Inferential Statistics

4.3.1 Correlation between Self-Regulation Behavior and Online Learning Outcomes

To determine the direction and degree of the association between student online learning results and self-regulation behaviour, Pearson product moment correlation was used in public universities in Kenya's Western region. The results were presented in Table 4.

Table 4

Correlation between Self-Regulation Behavior and Online Learning Outcomes

	Online learning outcomes
Self-regulation behavior	0.733 (0.000)

The correlation coefficient of 0.733 suggests a strong positive link, indicating that students' online learning outcomes improve in tandem with improvements in their self-regulation behaviour. The association appears to be statistically significant based on the p-value of 0.000, which is less than the significance level of 0.05. This suggests that improving students' online learning results requires self-regulation behaviour, which includes the capacity to set objectives, manage time, and track progress. Thus, developing self-regulation abilities may be a useful tactic to raise students' academic achievement in distance learning settings.

4.3.2 Model Summary for Self-Regulation Behavior

The model summary highlights the connection between students' online learning outcomes and their self-regulation behaviour, giving a broad overview of the regression model's fit. The results were shown in Table 5.

Table 5

Model Summary for Self-Regulation Behavior

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.743[a]	.552	.531	.237

The two variables have a substantial positive association, as indicated by the R-value of 0.743, which suggests that self-regulation behaviour is a significant predictor of online learning results. With a R Square value of 0.552, the model's explanatory power is moderate to strong, as self-regulation behaviour accounts for 55.2% of the variation in students' online learning results. The average gap between the observed values and the regression line is represented by the standard error of 0.237, which indicates a respectable degree of accuracy in forecasting online learning outcomes based on self-regulation behaviour. These findings suggest that students' academic performance in online learning settings may be enhanced by interventions targeted at enhancing their self-regulation abilities. Self-regulation behaviour also appears to have a significant impact on online learning outcomes.

4.4 ANOVA Test for Self-Regulation Behavior

The ANOVA test is used to assess if self-regulation behaviour and students' online learning outcomes are statistically related. The p-value of 0.003, which is below the significance level of 0.05, and the F value of 25.47, which is higher than the necessary F value of 3.86, both show that the model is statistically significant. This suggests that students' online learning outcomes can be significantly predicted by their self-regulation behaviour, which supports the particular goal that self-regulation affects academic achievement in online learning settings. The results were shown in Table 6.

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Table 6
ANOVA Test for Self-Regulation Behavior

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.872	1	17.872	25.47	.003[b]
	Residual	211.859	302	0.702		
	Total	**229.731**	**303**			

4.5 Regression Analysis for Self-Regulation Behavior

In this study, the regression analysis is used to assess how academic motivation affects students' online learning results in public universities located in Kenya's West area. The results were as shown in Table 7.

Table 7
Regression Analysis for Self-Regulation Behavior

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	2.791	0.752	3.711	.001
	SRB	1.137	0.251	4.528	.007

The linear regression model is as shown;
Y=2.791 + 1.137 SRB……Equation 4.1

When self-regulation is zero, the expected value of students' online learning results is represented by the beta constant of 2.791. This figure represents the basic level of online learning results when self-regulation is absent. Given that the T value of 3.711 is higher than 1.649, the beta constant is considered statistically significant. Additional evidence for the constant's relevance comes from the p-value of 0.001, which is below the 0.05 significance level. Therefore, even when self-regulation is not present, the constant has a significant impact on the dependent variable (online learning results).

For every unit increase in self-regulation, the online learning results changes, as indicated by the regression coefficient of 1.137. The statistical significance of the regression coefficient is demonstrated by the T value of 4.528, which is significantly higher than the critical value of 1.649. Additionally, the p-value of 0.007 is below 0.05, indicating a substantial correlation between online learning outcomes and self-regulation. This implies that students' online learning outcomes improve in tandem with their level of self-regulation behaviour.

The null hypothesis that self-regulation has no significant impact on students' online learning outcomes was rejected. These results imply that self-regulation strategies are a significant and positive predictor of online learning outcomes, emphasizing the importance of enhancing self-regulation skills to improve students' academic performance in online learning environments.

The results above aligned with Ndwiga et al. (2024) that looked at the relationship between academic accomplishment and self-regulated learning and academic motivation. Mutwelele came to the conclusion that improving academic results required the use of self-regulation techniques, such as goal-setting, self-monitoring, and modifying teaching methods. The study also highlighted that motivated students were more likely to use effective self-regulation strategies, which improved their performance on academic assignments, especially in self-directed learning settings like online courses.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Descriptive data showed that most participants agreed that students' self-regulation habits have an impact on their online learning results. It was evidenced by the fact that most of them said they still complete their online courses despite challenges. Self-regulation was positively and significantly correlated with students' online learning results, according to the correlation study. According to regression analysis, self-regulation had a favorable and substantial influence on students' online learning outcomes. Consequently, the study disproved the null hypothesis that self-regulation had no discernible effect on students' online learning by showing that the level of self-regulation behavior had a positive and significant impact on students' online learning outcomes.

5.2 Recommendations

According to the study's findings, the majority of participants were unable to complete their personal responsibilities and meet the due dates for their online assignments. It is consequently advised that university

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administration carry out focused interventions to improve students' self-regulation abilities, like time management classes and online task tracking platforms, to help students meet deadlines and complete their own projects for online courses. The overall results of online learning would be enhanced by this.

The study findings showed that most of the respondents do not set personal deadlines that help them stay on track with their online coursework. It is therefore recommended that management of public universities implement training programs that focus on developing self-regulation skills among students, specifically emphasizing the importance of setting personal deadlines to enhance time management and ensure better online learning outcomes

The findings indicated that when studying online, the majority of respondents do not block out distractions. Therefore, it is advised that public university administrations have policies and programs in place to educate students useful self-regulation skills, including how to control distractions when learning online. In order to enhance overall learning results, this could involve developing time management skills, setting up comfortable study spaces, and encouraging accountability.

REFERENCES

Aheto, S. P. K., Barfi, K. A., Kwesi, C., & Nyagorme, P. (2024). Relationships between online self-regulation skills, satisfaction, and perceived learning among distance education learners. *Heliyon, 10*(8), 1–10.

Amukune, S. (2022). Mastery motivation and executive functions as school readiness factors: Enhancement of school readiness in Kenya [Doctoral dissertation, Szegedi Tudomanyegyetem].

Best, J., & Kahn, J. (2011). *Research in education* (10th ed.). Pearson.

Bundi, R. K. (2024). Academic motivation and achievement emotions as predictors of self-regulated learning among Form Three students in Nyeri County, Kenya [Doctoral dissertation, Kenyatta University].

Carolan, C., Davies, C. L., Crookes, P., McGhee, S., & Roxburgh, M. (2020). COVID-19: Disruptive impacts and transformative opportunities in undergraduate nurse education. *Nurse Education in Practice, 46*, Article 102807. https://doi.org/10.1016/j.nepr.2020.102807

Cassidy, S. (2011). Self-regulated learning in higher education: Identifying key component processes. *Studies in Higher Education, 36*, 989–1000. https://doi.org/10.1080/03075079.2010.503269

Cheng, E. (2011). The role of self-regulated learning in enhancing learning performance. *International Journal of Research and Review, 6*(1), 45–49.

Creswell, J. W., & Clark, L. P. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-methods research: A discussion on its types, challenges, and criticisms. *Journal of Practical Studies in Education, 2*(2), 25–36.

Dwivedi, Y., Rana, N., Chen, H., & Williams, M. (2011). A meta-analysis of the unified theory of acceptance and use of technology (UTAUT) in governance and sustainability in info systems. In Springer (pp. xx–xx). https://doi.org/10.1007/978-3-642-24148-2_10

Ferrandino, J. (2021). Student achievement in undergraduate statistics: The potential value of allowing failure. *ERIC Education*.

Irfan, T. (2019). The interconnection of motivation and self-regulated learning among university level EFL students. *English Language Teaching, 12*(4), 105. https://doi.org/10.5539/elt.v12n4p105

Kariuki, A., Onyango, J., & Ndirangu, M. (2024). Relationship between self-efficacy and secondary school students' academic achievement in Kiswahili language skills in Nakuru County, Kenya. *Journal of Education and Practice, 4*(1), 65–74.

Kibuku, R., Ochieng, D., & Wausi, A. (2020). E-learning challenges faced by universities in Kenya: A literature review. *The Electronic Journal of E-learning, 18*(2), 150–161. https://doi.org/10.34190/EJEL.20.18.2.004

Kisanjara, S., Tossy, T., Sife, A., & Msanjila, S. (2017). An integrated model for measuring the impacts of e-learning on students' achievement in developing countries. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 13(3), 109–127.

Klimova, B., Gerniak, E., & Dziuba, S. (2022). University students and their ability to perform self-regulated online learning under the COVID pandemic. *Frontiers in Psychology, 13*, Article 781715. https://doi.org/10.3389/fpsyg.2022.781715

Kothari, C. (2019). *Research methodology, methods and techniques* (2nd ed.). New Age International Publishers.

Marinoni, G., Hilligje, V., & Jensen, T. (2020). The impact of COVID-19 on higher education around the world. *International Association of Universities*.

Matuga, J. (2009). Self-regulation, goal orientation, academic achievement of secondary students in online university courses. *Educational Technology and Society, 12*(3), 4–11.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

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Mugenda, A., & Mugenda, O. (2003). *Research methods: Qualitative and quantitative approaches*. Acts Press.

Nduta, M. M. (2019). Relationship between selected determinants of career aspiration and academic performance of students in public secondary schools in Nairobi County, Kenya [Doctoral dissertation, Kenyatta University].

Ndwiga, M. M., Ongeti, K., & Syomwene, A. (2024). The role of students' characteristics on use of blended learning approach in selected public universities in Kenya. *Journal of Research in Education and Technology, 2*(2), 20–38.

Orodho, A. J. (2009). *Techniques of writing research proposals and reports in education and social sciences*. Mazola Publishers.

Petrus, L., Degeng, I., & Setyosari, P. (2016). Relationship between achievement motivation and learning outcomes on land law course students Nusa Cendana University. In *Proceedings of the International Conference on Education 2016* (pp. 699–705).

Verma, R., Verma, S., & Abhishek, K. (2024). *Research methodology*. Booksclinic Publishing.

Wakanyi, K. P. (2023). Emotional self-regulation and risk-taking behaviour as predictors of academic achievement among Form Two students in Nairobi City County, Kenya [Doctoral dissertation, Kenyatta University].

Wei, H. C., & Chou, C. (2020). Online performance and satisfaction: Do perceptions and readiness matter? *Distance Education, 41*(1), 48–69.

Weyage, A. (2023). Entry behaviour, learner motivation, self-regulation and academic performance of first year information communication technology (ICT) students: Evidence from Kibi Technical Institute [Doctoral dissertation, University of Cape Coast].

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Macroeconomic stability factors and trade competitiveness Nexus Kenya

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ABSTRACT

This study investigates the influence of key macroeconomic stability factors—exchange rate, inflation, foreign direct investment (FDI), and gross domestic product (GDP)—on trade competitiveness in Kenya. Using annual time-series data from 1993 to 2023 sourced from the World Bank and the Central Bank of Kenya, the study employs a quantitative research design guided by the New Open Economy Macroeconomics (NOEM) framework. The data were analyzed using descriptive statistics, Augmented Dickey-Fuller (ADF) unit root tests, Johansen cointegration, Granger causality, and regression analysis. The findings indicate that all variables are integrated of order one and share a long-run equilibrium relationship. Granger causality tests show that there is a two-way relationship between the exchange rate and trade competitiveness and between GDP and competitiveness. There is only one way for FDI to affect competitiveness. Regression estimates demonstrate that a 1% depreciation in the exchange rate and a 1% rise in inflation reduce trade competitiveness by 0.642% and 0.488%, respectively. Conversely, a 1% increase in FDI and GDP enhances competitiveness by 0.521% and 0.491%, respectively. The study concludes that macroeconomic stability is a critical determinant of Kenya's trade performance. Policy recommendations include maintaining a stable and competitive exchange rate, anchoring inflation expectations, attracting targeted FDI, and fostering GDP growth through economic diversification to bolster Kenya's position in regional and global markets.

Keywords: Co-integration, Exchange Rate, Foreign Direct Investment, GDP, Inflation, Kenya, Macroeconomic Stability, Trade Competitiveness

I. INTRODUCTION

Trade competitiveness has become a pressing concern for both developed and developing nations in an era of shifting trade dynamics, technological advancements, and global economic volatility. Countries that strengthen their trade competitiveness are better positioned to attract foreign capital, expand market access, and withstand international shocks (Krugman, 2009). Export diversification, technological innovation, and supportive macroeconomic conditions have therefore emerged as central policy priorities worldwide (Carbaugh, 2005; Acaravci & Ozturk, 2012; World Bank, 2021).

In the African context, regional initiatives such as the East African Community (EAC) and the African Continental Free Trade Area (AfCFTA) have sought to enhance intra-African trade and reduce dependence on global commodity cycles. Yet, African economies remain vulnerable to price volatility, infrastructural gaps, and heavy reliance on primary exports (Matiy & Matundura, 2020). For countries like Kenya, these vulnerabilities are particularly acute. Historically dependent on tea, coffee, and horticultural products, Kenya's export structure has shifted only marginally toward diversification. High production costs, underdeveloped manufacturing capacity, and weak investment in value-added sectors continue to constrain long-term competitiveness (Wagacha, 2000; Karuraa, 2017).

Although prior studies have examined elements of Kenya's trade performance, they often focus on individual macroeconomic variables—such as the exchange rate or inflation—or limited time horizons (UNCTAD, 2021). This fragmented approach has left a critical gap: the combined and long-term influence of key macroeconomic stability factors on Kenya's trade competitiveness remains underexplored.

This study addresses this gap by analyzing the impact of four macroeconomic variables—exchange rate, inflation, foreign direct investment (FDI), and gross domestic product (GDP)—on Kenya's trade competitiveness over a 30-year period (1993–2023). Guided by the New Open Economy Macroeconomics (NOEM) framework, which highlights the interplay between policy, macroeconomic stability, and trade performance in small open economies, the study pursues the following objectives: (i) to analyze the relationship between exchange rates and trade competitiveness, (ii) to assess the influence of inflation, (iii) to determine the impact of FDI, and (iv) to measure the effect of GDP.

The contribution of this study is twofold. Academically, it enriches the literature by providing an integrated, long-term analysis of multiple macroeconomic variables within a coherent framework. From a policy perspective, the

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findings will help identify which macroeconomic levers are most critical for enhancing Kenya's export performance and deepening its integration into regional and global markets.

1.2 Research Objectives

The main purpose of this paper is to empirically analyze the Nexus between selected Macroeconomic Variables and Trade Competitiveness in Kenya. To achieve this objective, the paper specifically sought to:

i) Analyze the nexus between Exchange rates and Trade Competitiveness in Kenya,
ii) Assess the nexus between Inflation and Trade Competitiveness in Kenya
iii) Determine the nexus between Foreign Direct Investment and Trade Competitiveness in Kenya
iv) Measure the nexus between GDP and Trade Competitiveness in Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

The concept of trade competitiveness extends beyond the ability to sell goods abroad; it encompasses a nation's capacity to improve domestic living standards through efficient export performance (World Bank, 2015). Classical trade theories, such as Ricardo's principle of comparative advantage, provide the foundation for explaining trade gains from specialization. However, these models largely assume stable macroeconomic environments and neglect the role of shocks, capital flows, and policy.

Firm-level approaches and New Trade Theory (Krugman, 2009) emphasize economies of scale, product differentiation, and productivity as determinants of trade outcomes. These models explain how innovation and efficiency drive competitiveness but often treat macroeconomic instability such as inflation volatility or exchange rate shocks as exogenous, rather than integral, to competitiveness dynamics.

The NOEM framework emerged in the 1990s to address limitations in traditional open economy models. It integrates Keynesian nominal rigidities with micro-founded models of international trade and finance (Obstfeld & Rogoff, 1995). Its key assumptions include: Nominal rigidities**:** Prices and wages adjust sluggishly, making economies vulnerable to short-run shocks. Policy transmission**:** Monetary and fiscal policies directly affect macroeconomic stability and, by extension, trade outcomes. Capital mobility: Open economies face spillovers from global capital and financial flows. This framework is particularly suited for analyzing the influence of exchange rates, inflation, FDI, and GDP on trade competitiveness. Unlike comparative advantage or firm-level models, NOEM explicitly incorporates both the short-term effects of stability shocks and the long-term linkages of global integration.

Kenya, as a small open economy, is highly exposed to global and domestic macroeconomic shocks. Exchange rate volatility, persistent inflationary pressures, and fluctuating capital inflows have historically constrained its export performance. Structural dependence on primary commodities further amplifies these effects. The NOEM framework, therefore, provides a robust lens to evaluate Kenya's competitiveness by linking macroeconomic policy, stability, and trade outcomes in both the short and long term.

2.2 Empirical Review

Macroeconomic stability fosters an environment conducive to investment and export growth (Montiel & Serven, 2008). Exchange rates are central to this process. In Kenya, Karuraa (2017) found a positive relationship between exchange rates and export earnings, while Aldan et al. (2012) demonstrated that trade flows are highly sensitive to exchange rate changes. International evidence remains mixed: Saygılı (2010) in Turkey reports that exchange rate flexibility supports competitiveness, while Lotfalipour (2014) finds limited effects in Iran. Kiptui (2017) specifically highlights the adverse impact of volatility on Kenyan manufactured exports, underscoring the vulnerability of developing economies to exchange rate shocks.

High and unpredictable inflation erodes competitiveness by distorting relative prices as well as raising production costs. Kabundi (2012) identifies both domestic and external inflationary pressures in South Africa, while Kiptui (2013) shows similar dynamics in Kenya's agricultural exports. Some studies note that moderate inflation, when accompanied by productivity growth, may not severely harm competitiveness. However, the prevailing consensus is that persistent inflation undermines export performance in developing economies.

FDI can strengthen competitiveness through technology transfer, market access, and capital inflows. Mijiyawa (2017) confirms a positive FDI–exports relationship in multiple African economies, while Gamariel & Hove (2019) find similar results in Zimbabwe. Conversely, Drama et al. (2014) report a negative correlation in Sub-Saharan Africa, attributing it to resource-seeking rather than efficiency-seeking FDI. Kenya reflects this tension: while FDI inflows have supported growth in services and horticulture, structural bottlenecks have limited broader spillovers into competitiveness.

Trade and GDP are often mutually reinforcing. Musila (2015) argues that higher GDP facilitates export growth through scale economies, while Mohammed (2023) finds bidirectional causality in several Sub-Saharan economies. In

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Kenya, Miriti (2024) shows that GDP fluctuations particularly tied to agriculture—translate into volatility in export performance. This suggests that sustained competitiveness requires not just growth but also structural transformation.

The reviewed literature reveals three key gaps. First, existing studies tend to analyze individual macroeconomic variables in isolation, with limited evidence on their combined and long-term effects on trade competitiveness. Second, while Kenya is a textbook case for applying the NOEM framework, few empirical studies explicitly adopt it. Third, findings on the role of FDI and exchange rate volatility remain inconsistent, underscoring the need for updated, context-specific evidence. This study addresses these gaps by applying the NOEM framework to Kenya over a 30-year period (1993–2023), empirically examining how exchange rates, inflation, FDI, and GDP jointly shape trade competitiveness.

III. METHODOLOGY

3.1 Research Design and Data Sources

This study adopted an explanatory (causal) research design, which seeks to determine cause–effect relationships between independent variables and the dependent variable (Walliman, 2011). The design was chosen because it enables the analysis of how exchange rate, inflation, foreign direct investment (FDI), and gross domestic product (GDP) influence Kenya's trade competitiveness.

The analysis relied exclusively on annual secondary data covering the period 1993–2023. Data on exchange rate, inflation, foreign direct investment, and gross domestic product were obtained from the World Bank Development Indicators (WDI) and publications of the Central Bank of Kenya (CBK). Trade competitiveness indicators were collected from the Kenya National Bureau of Statistics (KNBS). These sources were selected due to their credibility, consistency, and international comparability.

3.2 Sampling Strategy

The study did not employ primary sampling techniques, as it relied on secondary time-series data. The target population comprised annual macroeconomic data between 1993 and 2023, including exchange rates, inflation, FDI, GDP, and trade competitiveness. This period was selected to ensure sufficient observations for reliable econometric analysis while capturing recent macroeconomic developments in Kenya.

3.3 Data Collection

The data were collected exclusively from secondary sources, namely the World Bank Development Indicators (WDI), Central Bank of Kenya (CBK) publications, and Kenya National Bureau of Statistics (KNBS) reports. These institutions provide reliable, standardized, and publicly accessible economic data. The variables considered include:

Exchange Rate: Current US$

Inflation: Annual percentage change in consumer prices

Foreign Direct Investment (FDI): Current US$ inflows

Gross Domestic Product (GDP): Current US$

Trade Competitiveness (Exports): Value of products and services produced in Kenya and sold abroad (Current US$).

3.4 Data Analysis

The analysis employed a combination of descriptive and inferential statistical techniques utilizing EViews version 14. Initially, descriptive statistics such as means, minima, maxima, and standard deviations were used to summarize the data and provide an overview of the variables under consideration. To ensure the robustness of the econometric models, stationarity tests including the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were conducted to detect the presence of unit roots and prevent spurious regression results. The Johansen cointegration test was then applied to identify any long-run equilibrium relationships among the variables, indicating potential cointegration. To explore the directional relationships between macroeconomic factors and trade competitiveness, Granger causality tests were performed. Additionally, correlation analysis was used to assess the linear associations between variables and to detect potential multicollinearity issues. Finally, ordinary least squares (OLS) regression analysis was employed to estimate the magnitude and statistical significance of the explanatory variables' effects on trade competitiveness.

The functional model specified is:

$$COM_t = \beta_0 + \beta_1 ER_t + \beta_2 INF_t + \beta_3 FDI_t + \beta_4 GDP_t + \varepsilon_t$$

Where:

(COM_t) = Trade Competitiveness at time t

(ER_t) = Exchange Rate

(INF_t) = Inflation

(FDI_t) = Foreign Direct Investment

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(GDP_t) = Gross Domestic Product
(ε_t) = Error term

3.5 Ethical Considerations

The study relied exclusively on secondary data drawn from reputable and publicly available sources, namely the World Bank, the Central Bank of Kenya, and the Kenya National Bureau of Statistics. All data sources were duly acknowledged in line with academic integrity and ethical research practices. Additionally, the researcher obtained authorization from Moi University and a research license from the National Commission for Science, Technology and Innovation (NACOSTI), ensuring compliance with institutional and national research ethics requirements.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics and Preliminary Tests

The descriptive statistics highlight notable volatility in FDI (Std. Dev. = 34.27) and GDP (Std. Dev. = 33.92) over the study period, alongside wide swings in inflation ranging between 1.6% and 54.7% (Table 1). Such variability reflects Kenya's exposure to both domestic and external shocks. In the NOEM framework, these fluctuations illustrate the challenges of achieving nominal stability in a small open economy, where global shocks are rapidly transmitted into domestic markets.

Table 1
Descriptive Statistics

	ER	FDI	GDP	INF	COM
Mean	2.728620	24.96864	49.14010	8.912903	27.15655
Median	2.761302	10.52500	41.05800	6.600000	23.85400
Maximum	2.865693	136.9200	114.7330	54.70000	43.28700
Minimum	1.496880	0.000000	10.47900	1.600000	11.17800
Std. Dev.	0.113883	34.27077	33.92150	9.392860	10.73288
Observations	31	31	31	31	31

Stationarity tests (ADF) confirmed that all variables were integrated of order one, I(1). The Johansen cointegration test revealed four cointegrating equations at the 5% level (Table 2), implying a stable long-run equilibrium among macroeconomic variables and trade competitiveness. This finding validates the theoretical expectation that macroeconomic fundamentals and trade performance move together over time.

Table 2
Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.980244	175.1657	69.81889	0.0000
At most 1 *	0.892384	96.67940	47.85613	0.0000
At most 2 *	0.811391	52.09576	29.79707	0.0000
At most 3 *	0.600704	18.73421	15.49471	0.0157
At most 4	0.018486	0.373187	3.841466	0.5413

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

4.2 Granger Causality and Correlation Analysis

Granger causality results show bidirectional causality between exchange rate and trade competitiveness, and between GDP and trade competitiveness (Table 3). This reinforces the mutual feedback predicted by NOEM, where trade shocks influence macro stability, and vice versa. The unidirectional causality from FDI to trade competitiveness suggests that foreign inflows drive export capacity but are not significantly shaped by Kenya's trade outcomes—consistent with Drama et al. (2014), who noted resource-seeking FDI dominance in Sub-Saharan Africa.

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Table 3
Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob
Exchange Rate does not Granger Cause Competitiveness	31	1.81214	0.0218
Competitiveness does not Granger Cause Exchange Rates		0.9620	0.0486
FDI does not Granger Cause Competitiveness	31	0.3402	0.0016
Competitiveness does not Granger Cause FDI		0.0721	0.4720
Inflation rate does not Granger Cause Competitiveness	31	0.9286	0.0008
Competitiveness does not Granger Cause Inflation rates		1.2824	0.0047
GDP does not Granger Cause Competitiveness	31	8.4581	0.0002
Competitiveness does not Granger Cause GDP		4.3902	0.0072

The correlation analysis (Table 4) strengthens these insights. Trade competitiveness is negatively associated with exchange rates ($r = –0.591$, $p < 0.05$) and inflation ($r = –0.455$, $p < 0.05$), while positively associated with FDI ($r = 0.734$, $p < 0.05$) and GDP ($r = 0.693$, $p < 0.05$). In practical terms, this means macroeconomic instability—via currency depreciation and rising prices—erodes competitiveness, while stronger growth and foreign investment enhance it.

Table 4
Correlation Matrix

	COM	INF	GDP	FDI	ER
COM	1				
INF	-0.45536	1			
	0.0014				
GDP	0.69270	-0.21852	1		
	0.0000	0.000			
FDI	0.73395	-0.15163	0.80298	1	
	0.0001	0.0016	0.000		
ER	-0.59097	-0.28355	0.96801	0.74108	1
	0.0028	0.0139	0.00134	0.0016	

4.3 Regression Results

The OLS regression results for the individual relationships are summarized in Table 5.

Table 5
Summary of Regression Results

Independent Variable	Coefficient (β)	R-squared	t-statistic	p-value	Relationship
Exchange Rate (ER)	-0.642	0.247	7.101	0.000	Negative & Significant
Inflation (INF)	-0.488	0.209	6.383	0.000	Negative & Significant
FDI	0.521	0.255	7.256	0.000	Positive & Significant
GDP	0.491	0.160	5.409	0.000	Positive & Significant

The regression findings (Table 5) provide further evidence.

Exchange Rate ($\beta = –0.642$, $p < 0.01$): A 1% depreciation in the Kenya shilling is associated with a 0.64% decline in trade competitiveness. Rather than improving exports, depreciation worsens performance because Kenya relies heavily on imported intermediate inputs, raising production costs. This contradicts the "expenditure-switching" benefits assumed by traditional trade theories but aligns with NOEM's emphasis on nominal rigidities and imported inflation.

Inflation ($\beta = –0.488$, $p < 0.01$): Inflation significantly reduces competitiveness, consistent with Kabundi (2012) and Kiptui (2013). Rising domestic prices undermine relative price stability, discourage long-term contracts, and reduce Kenya's reliability as a trading partner. This supports the NOEM prediction that instability in domestic monetary conditions weakens external competitiveness.

FDI ($\beta = 0.521$, $p < 0.01$): The positive and significant coefficient suggests that foreign capital inflows enhance competitiveness through technology transfer and expanded production. However, the magnitude also reflects the structure of investment: without targeting tradable sectors, FDI's impact remains limited compared to economies with stronger manufacturing bases.

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GDP (β = 0.491, p < 0.01): Economic growth contributes positively to competitiveness by enabling scale economies and boosting production capacity. This confirms Musila (2015), who observed a mutually reinforcing relationship between output growth and trade. Yet, as Miriti (2024) noted, growth concentrated in agriculture exposes Kenya to volatility, limiting the sustainability of these gains.

4.3 Discussion

4.3.1 Descriptive Statistics and Preliminary Tests

The descriptive statistics revealed notable volatility in FDI (Std. Dev. = 34.27) and GDP (Std. Dev. = 33.92), while inflation fluctuated widely between 1.6% and 54.7% over the study period. These patterns highlight the macroeconomic instability that often characterizes developing economies such as Kenya. Consistent with prior findings by Karuraa (2019), macroeconomic volatility provides a challenging environment for sustaining trade competitiveness. The stationarity tests confirmed that all variables were I(1), and the Johansen cointegration results established the existence of four long-run cointegrating relationships, underscoring a stable long-run interaction among trade competitiveness, exchange rate, inflation, FDI, and GDP. This aligns with the New Open Economy Macroeconomics (NOEM) framework, which emphasizes the long-run linkages between domestic policy variables and external trade performance.

4.3.2 Granger Causality and Correlation Analysis

The Granger causality tests provided insights into the directionality of relationships. The bidirectional causality between exchange rate and trade competitiveness confirms NOEM's prediction that currency fluctuations influence external trade while trade performance can also feed back into exchange rate dynamics. Similar patterns have been documented by Mijiyawa (2017) in West African economies, suggesting that Kenya's experience is part of a broader regional trend. The unidirectional causality from FDI to trade competitiveness is consistent with Drama et al. (2020), who found that foreign investment enhances export capacity by injecting capital and technology. The correlation analysis reinforced these findings, showing strong positive associations of FDI and GDP with competitiveness, and negative associations of inflation and exchange rate volatility, all statistically significant.

4.3.3 Regression Results and Interpretation

The OLS regression results (Table 5) provide robust evidence that macroeconomic variables significantly influence trade competitiveness.

Exchange Rate (β = -0.642, p<0.01): The significant negative relationship suggests that currency depreciation undermines competitiveness. While theory often predicts that weaker currencies should boost exports, Kenya's import-dependent industries face rising input costs, which offset gains. This finding resonates with NOEM, which highlights how imperfect pass-through and structural rigidities can alter expected outcomes. Comparable evidence was reported by Karuraa (2019), who observed that exchange rate depreciation in Kenya tends to raise production costs, reducing export competitiveness.

Inflation (β = -0.488, p<0.01): Inflation's negative impact aligns with both theoretical predictions and empirical results by Drama et al. (2020), who found that high inflation erodes export competitiveness in Sub-Saharan Africa. This underscores NOEM's emphasis on nominal rigidities, where price instability reduces the predictability of real exchange rates, thereby undermining competitiveness.

FDI (β = 0.521, p<0.01): The positive effect of FDI supports the literature (e.g., Mijiyawa, 2017), which emphasizes its role in improving technological capacity and integration into global value chains. Within the NOEM framework, FDI expands productive capacity and lowers marginal production costs, enabling exporters to compete internationally.

GDP (β = 0.491, p<0.01): The strong positive impact of GDP growth corroborates findings by Karuraa (2019), showing that broader economic growth strengthens export supply capacity. From a NOEM perspective, growth provides the infrastructure and human capital necessary for external competitiveness.

Overall, the findings reinforce and extend existing empirical evidence while demonstrating the applicability of the NOEM framework to Kenya. This contribution helps bridge the gap between theory and policy, offering insights for both academic discourse and practical trade policy formulation.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study concludes that macroeconomic stability—captured through exchange rate movements, inflation, foreign direct investment (FDI), and gross domestic product (GDP)—plays a decisive role in shaping Kenya's trade competitiveness. The results demonstrate that all four variables are statistically significant determinants in both the short and long run. The Johansen cointegration results confirm the existence of a stable long-run equilibrium, implying that

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these factors do not act in isolation but instead evolve together to influence the trajectory of Kenya's external trade performance. The findings align with the New Open Economy Macroeconomics (NOEM) framework, which emphasizes the interplay between macroeconomic policies, market rigidities, and international trade outcomes. The negative impacts of exchange rate depreciation and inflation highlight the vulnerabilities of an import-dependent economy, where cost-push pressures and price instability can erode export competitiveness despite theoretical expectations of gains from a weaker currency. At the same time, the positive contributions of FDI and GDP underscore the importance of investment-driven growth, technological spillovers, and productive capacity in enhancing global competitiveness.

5.2 Recommendations

Based on these findings, the study offers the following policy recommendations: The Central Bank of Kenya should pursue policies that minimize excessive exchange rate volatility. While flexibility is important, sharp depreciations can be harmful. A focus on maintaining a stable and competitive real exchange rate is essential. Anchoring inflation expectations through prudent monetary policy must remain a priority. Low and stable inflation preserves purchasing power and is critical for sustaining the price competitiveness of Kenyan exports.

REFERENCES

Acaravci, A., & Ozturk, I. (2012). Foreign direct investment, export and economic growth: Empirical evidence from new EU countries. *Romanian Journal of Economic Forecasting, 0*(2), 52–67. https://ideas.repec.org/a/rjr/romjef/vy2012i2p52-67.html

Aldan, A., Bozok, İ., & Günay, M. (2012). Short-run import dynamics for Turkey (Working paper No. 12/25). Central Bank of the Republic of Turkey.

Carbaugh, R. J. (2005). *The international economy and globalization.* Thomson Corporation.

Drama, B. G., Mzee, S. S., & Ngwali, J. (2014). The determinants of export performance: The case study of Zanzibar export. *International Journal of Economics and Finance, 6*(6), 220–228.

Gamariel, G., & Hove, S. (2019). Foreign direct investment and export competitiveness in Africa. *Journal of African Trade, 6*(1–2), 30–46.

Kabundi, A. (2012). The dynamics of inflation in Uganda: An error correction model (Working Paper No. 1-13). Bank of Uganda.

Karuraa, N. M. (2017). The impact of exchange rate fluctuation determinants on export earnings in Kenya. *International Journal of Economics, Commerce and Management, 5*(6), 486–518.

Kiptui, M. (2013). *Determinants of inflation in Kenya* (Master's thesis). University of Nairobi, Kenya.

Krugman, P. (2009). Increasing returns in comparative advantage. *World Journal of Economics & Finance.*

Lotfalipour, M. R., & Bazargan, B. (2014). The impact of exchange rate volatility on trade balance of Iran. *Advances in Economics and Business, 2*(8), 293–302. https://doi.org/10.13189/aeb.2014.020801

Matiy, A., & Matundura, E. (2020). Analysis of macroeconomic factors affecting the performance of manufactured exports in Kenya. *International Journal of Business & Management, 7*(9).

Mijiyawa, A. G. (2017). Does foreign direct investment promote exports? Evidence from African countries. *The World Economy, 40*(9), 1934–1957. https://doi.org/10.1111/twec.12465

Montiel, P. J., & Serven, L. (2008). Real exchange rates, saving and growth: Is there a link? (Policy Research Working Paper No. 4636). The World Bank.

Musila, J. W., & Yiheyis, Z. (2015). The impact of trade openness on growth: The case of Kenya. *Journal of Policy Modeling, 37*(2), 342–354. https://doi.org/10.1016/j.jpolmod.2014.11.002

UNCTAD (United Nations Conference on Trade and Development). (2021). *Beyond austerity: Toward a global new deal* (Report No. 2021). United Nations.

Wagacha, B. M. (2000). *Analysis of liberalization of the trade and exchange regime in Kenya since 1980* (Vol. 23). Institute of Policy Analysis and Research.

Waliullah, M. K., Kakar, R., Kakar, W., & Khan, W. (2010). The determinants of Pakistan's trade balance: An ARDL cointegration approach. *The Lahore Journal of Economics, 15*, 1–26.

World Bank. (2015). *World development report 2015: Mind, society, and behavior*. https://doi.org/10.1596/978-1-4648-0342-0

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Innovation performance of small and medium enterprises: The impact of transformational leadership and work engagement in small and medium manufacturing enterprises in the Greater Kampala Metropolitan Area, Uganda

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ABSTRACT

The purpose of this paper is to explore the relationship between transformational leadership, work engagement, and innovation performance in the context of small and medium manufacturing enterprises in the Greater Kampala Metropolitan Area, Uganda. This study was grounded in the upper echelons theory and social exchange theory. A cross-sectional research design was employed to collect data from 326 small and medium-sized manufacturing enterprises in the Greater Kampala Metropolitan Area, Uganda. Data were collected using a structured, self-administered questionnaire. The data were analysed using the Statistical Package for the Social Sciences (version 27) and the Hayes Process Macro (version 4.2). The findings indicate that transformational leadership ($\beta = .509$, $p<.001$) and work engagement ($\beta = .256$, $p<.001$) have a positive and significant influence on innovation performance. The results revealed that transformational leadership significantly predicts work engagement ($\beta = .543$, $p < .001$). Work engagement significantly mediated the relationship between transformational leadership and innovation performance ($\beta = .135$, 95% Boot CI = .073, .206). The study concludes that work engagement mediates the relationship between transformational leadership and innovation performance. Owner-managers seeking to enhance the innovation performance of their SMEs should attend leadership symposia to improve their transformational leadership behaviour. Creating an atmosphere where employees' needs are catered to, they can express themselves, trust is built, and relationships are fostered, making employees feel part of the firm and resulting in more innovative initiatives. This study advances understanding of innovation performance in manufacturing SMEs in developing countries, particularly Uganda.

Keywords: Innovation Performance, Small and Medium Enterprises, Transformational Leadership, Work Engagement

I. INTRODUCTION

Innovation has continued to increase the survival, thriving, and creating competitive advantage of firms (Farida & Setiawan, 2022; Ferreira & Coelho, 2020) in the face of rapid technological changes, global economic integration, and changing market demand (Kaplinsky & Kraemer-Mbula, 2022; Wu *et al*., 2022). Innovation entails "a firm's ability to create new products, work processes, markets, and management procedures" (Hanaysha *et al*., 2022; Le & Lei, 2019; Organisation of Economic Cooperation and Development (OECD) Oslo Manual, 2005; Tidd, 2023). The firm's success depends on its innovation ability in order to be abreast with the changing business environment (Andersson *et al*., 2020; Sawaean & Ali, 2020) Many manufacturing firms have realised that enhancing their innovation performance is of the essence (Hanifah *et al*., 2020; Pomegbe *et al*., 2020) as many are finding ways to improve this, although the majority are still limited and struggle in their innovation pursuit (Adomako & Nguyen, 2020; Oduro, 2020). This is particularly true in developing countries, where the majority of manufacturing firms are small and medium-sized, often constrained by resource limitations and limited financial access (Endris & Kassegn, 2022; Eton *et al.*, 2021). Such challenges have heightened academicians' quest to identify less costly factors to enhance SMEs' innovation performance.

Small and medium-sized enterprises play an important role in innovation due to their dynamism, which enables them to adapt quickly and flexibly (Heider *et al*., 2021). SMES are key drivers of job creation, economic growth, and innovation (Gherghina *et al*., 2020). In the global economy, businesses comprise 90% of SMEs (Batrancea *et al*., 2022; Melo *et al*., 2023). However, small and medium-sized enterprises are less efficient and exhibit lower levels of innovation than large firms (Hervás-Oliver *et al*., 2021; Radicic & Petković, 2023; Vives, 2022), particularly in emerging and developing economies compared to developed ones (Dey *et al*., 2020).

In the Ugandan context, research highlights the weak capabilities of current STI as well as an underdeveloped national innovation system in all enterprises (Mulumba *et al*., 2023; National Planning Authority (NPA), 2020), and

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manufacturing SMEs operate under capacity due to sales decline accruing from low demand for locally manufactured goods (Sserunjogi *et al*., 2021). Specifically, business expenditure on research and development was 0.01%, resulting in 250 patent applications, of which only two were registered (Jjagwe *et al*., 2024). Despite the importance of innovation performance to the growth, survival, and sustainability of SMEs, studies on IP regarding leadership in Ugandan SMEs are scarce. Little attention is given to research on IP in manufacturing SMEs in Uganda. Existing studies have looked at innovation in terms of inputs (Ahimbisibwe *et al*., 2024; Kagere *et al*., 2025; Mugisha & Ijjo, 2022) and process (Bakashaba *et al*., 2024; Mulumba *et al*., 2023), and there is a lack of research on innovation as an output, thus necessitating investigating innovation performance from the organisational context in manufacturing SMEs.

Previous studies have identified leadership as a crucial factor in innovation performance (Alblooshi *et al*., 2021; Cortes & Herrmann, 2021; Nani & Safitri, 2021). Transformational leadership has been identified as a precursor for innovation performance (Alblooshi *et al*., 2021; Bass & Riggio, 2006; Cortes & Herrmann, 2020). Transformational leadership (TL) is the ability of a leader to raise employees' motivation through a vision and to persuade them to focus on organisational goal attainment (Avolio, 2004; Bass & Avolio, 1994). Transformational leaders stimulate employees' intellectual ability, encourage openness and communication, and inspire and motivate employee innovativeness in the organisation (Li *et al*., 2012).

Emerging and developing markets face resource constraints that have compelled enterprises to reassess their innovation strategies. As such, organisations are looking at their internal context to improve their innovation success. Work engagement (WE) is a key contextual employee resource for positive organisational behaviour (Kwon & Kim, 2020) and a critical resource for innovation performance (Peng & Chen, 2023; van Zyl *et al*., 2021). Work engagement fosters the firm's innovation performance by increasing employees' creativity levels when they are absorbed in work activities. Gemeda and Lee (2020) and Lei *et al*. (2020) argue that WE is not only a precursor to organisational innovation, but it also intervenes in the relationship between TL and innovation. WE aligns employees with organisational goals, and they go beyond expectations (Bakker, 2017; Schaufeli, 2013). WE enables employees to become infused with a sense of purpose, enthusiasm, and energy (Osborne & Hammoud, 2017).

TL and WE are considered precursors of innovation performance; however, empirical research on how WE mediates the relationship between TL and innovation performance is limited. Even so, the indirect effect of WE on the relationship between TL and IP remains unclear. This study aimed to bridge the theoretical gap and extend our understanding of how WE indirectly affects the relationship between TL and IP.

1.1 Statement of the Problem

Innovation performance is crucial to enhancing SME competitiveness. (Yikilmaz & Cekmecelioglu, 2023). Manufacturing SMEs' ability to innovate is essential to their continued existence (Issau *et al*., 2021). In 2024, Uganda ranked 121st out of 133 countries, and in 2023, it ranked 121st out of 132 countries, indicating a decline in innovation performance along with a decline in innovation inputs and outputs, World Intellectual Property Organization (WIPO) (2024). Additionally, the majority of SMEs fail to survive past their fifth year of operation, according to the 2015 Global Entrepreneurship Monitor Report (Bosma *et al*., 2015), and Ugandan SMEs continue to exhibit low levels of innovativeness (Dawa *et al*., 2025; Nduhura *et al*., 2022).

Manufacturing SMEs are operating below capacity due to declining sales driven by low demand for locally manufactured goods (Sserunjogi *et al*., 2021), as well as the existing STIs' insufficient capabilities and an inadequate national innovation system across all firms (Mulumba *et al*., 2023; NPA, 2020). Despite the importance of IP to the growth, survival, and sustainability of SMEs, studies on IP regarding leadership in Ugandan SMEs are scarce. Little attention is given to research on IP in manufacturing SMEs in Uganda. Existing studies have looked at innovation in terms of inputs (Ahimbisibwe *et al*., 2024; Kagere *et al*., 2025; Mugisha & Ijjo, 2022) and process (Bakashaba *et al*., 2024; Mulumba *et al*., 2023), and there is a lack of research on innovation as both an input and output, thus necessitating investigating innovation performance from the organisational context in manufacturing SMEs.

1.2 Research Objectives

i. To examine the effect of transformational leadership on innovation performance.
ii. To assess the effect of work engagement on innovation performance.
iii. To establish the effect of transformational leadership on work engagement.
iv. To examine the mediating effect of work engagement on the relationship between transformational leadership and innovation performance.

1.3 Hypotheses

H0₁: Transformational Leadership is not positively related to innovation performance.
H0₂: Work engagement is not positively related to innovation performance.
H0₃: Transformational leadership is not positively related to work engagement.
H0₄: Work engagement does not mediate the effects of transformational leadership on innovation performance.

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II. LITERATURE REVIEW

2.1 Theoretical Review

Upper Echelons Theory and Social Exchange Theory underpin this study. The Upper Echelons Theory (Hambrick & Mason, 1984) emphasizes how leadership influences interpretations that impact the company's strategy, including decisions related to innovation. The two fundamental tenets of UET are that top management bases its decisions on interpretations of the external environment, and that these interpretations are shaped by the manager's individual beliefs, personalities, experiences, and behaviours (Hambrick, 2007). The Upper Echelons Theory explains that the leadership of these enterprises can enable or constrain SME innovation performance. Leaders' decisions contribute to innovation in SMEs (Hoang *et al*., 2021). Transformational leaders foster leader-follower value congruence, spark enthusiasm for work, convey a compelling group vision, and cultivate effective relationships with their subordinates (Monje-Amor *et al*., 2020; Van Tuin *et al*., 2021). Based explicitly on the UET, it is reasonable to deduce that innovation performance levels in SMEs are directly related to the TL behaviour of owners or managers.

The Social Exchange Theory posits that employer-employee relationships are shaped through a series of interactions characterized by reciprocity norms (Blau, 1964). The norms of reciprocity argue that one party's actions elicit reactions/responses from the other party. Reciprocity norms establish that one party's actions result in actions or responses by the other party. As both parties work towards mutual gains, the social exchange is balanced (Cropanzano & Mitchell, 2005). Based on SET, this study deduces that when the transformational owners/ managers of SMEs can make employees aware of the meaning of tasks they undertake, focus on the individual needs of subordinates, they establish a mutual trust atmosphere where employees get committed, intrinsically motivated to do their work, resulting in creative and innovative outcomes.

2.2 Empirical Review

2.2.1 Transformational Leadership and Innovation Performance

Research has shown that TL affects organisational outcomes, including organisational performance (Hilton *et al*., 2023) and organisational innovation (Mokhber *et al*., 2018). Bass (1990) identifies TL in terms of idealized influence (II), intellectual stimulation (IS), inspirational motivation (IM), and individualized consideration (IC). II is the leader's ability to provide a vision, instill pride, and gain respect and trust from the subordinates. IS refers to the leader's ability to promote intelligence, rationality, and attentive problem-solving (Le *et al*., 2025). Inspirational motivation involves the leader communicating expectations, using symbols to focus efforts (Le *et al*., 2025), and serving as a role model to subordinates (Gui *et al*., 2024). Individual consideration involves the leader providing personal attention to followers through coaching and advising, treating each employee as an individual rather than as a group. Many scholars have continued to show interest in TL, and as such, examining the relationship between TL and innovation performance will broaden our understanding of the leadership-innovation management debate (Gui *et al*., 2024).

Innovation performance drives economic development, playing a crucial role at the international, national, and firm levels (Azeem *et al*., 2021; Surya *et al*., 2021). Le and Lei (2019), Molina-Morales *et al*. (2014), and Yang *et al*. (2020) defined innovation performance: "Innovation performance is the product of several management techniques employed in organizations' business operations to produce or improve products, processes, marketing, and management". Innovation performance is classified into "product innovation performance, process innovation performance" (Prajogo & Sohal, 2006; Zheng, 2024), "market innovation performance," and "organisational innovation performance" (OECD, 2005; Kankisingi & Dhliwayo, 2022; Soto-Acosta *et al*., 2017). Product innovation performance reflects the newness and meaningfulness of products introduced to the market, leading to increased sales, higher research and development expenditures, higher cash flow, and higher profits. Process innovation performance refers to changes in the firm's production methods, focusing on the speed, novelty, flexibility, and adaptability of these processes. Market innovation performance refers to how market research, new market entry, new market exploitation, advertising, and promotion contribute to market development, customer loyalty, and the attractiveness of the products offered. Finally, organisational innovation performance is the alignment of employees' strategies, skills, and commitment, as well as the integration of research and development into innovation goals.

There is scholarly work on the influence of TL on innovation performance (Gui *et al*., 2024). According to Tajasom *et al*. (2015) and Nguyen *et al*. (2023), TL positively affects innovation performance. Literature has highlighted that the key behaviours of transformational leaders directly or indirectly affect innovation performance. Specifically, with TLs' idealised influence, it is easy to motivate and persuade employees to implement organisational changes and be innovative (Le & Lei, 2019). Employees can support and be involved in innovation efforts led by their transformational leaders, as collective interests are prioritized (Prasad & Junni, 2016). Through inspirational motivation, transformational leaders motivate employees to fulfil their duties and achieve organizational goals and objectives (Bass, 1990; Gemeda & Lee, 2020; Prasad & Junni, 2016). Thus, by emphasizing innovation performance, transformational leaders motivate employees to be more creative and innovative, thereby developing new ideas and providing solutions

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to improve product, process, marketing, and organizational innovation performance (Le & Lei, 2019). Through intellectual stimulation, transformational leaders encourage employees to think outside the box (Cui *et al*., 2022), enabling them to focus on the organisational vision, commit to achieving it, and work towards making it a reality (Hoai *et al*., 2022).

Therefore, TL can inspire employees to innovate and improve current products, processes, markets, and organisational systems to meet the organisational goals and vision (Le & Lei, 2019; Gui *et al*., 2024). With individualised consideration, transformational leaders can develop employees' competencies by offering them opportunities to learn, thereby fostering their innovative thinking (Novitasari *et al*., 2021; Prasad & Junni, 2016). Moreover, by attending to each employee's individual needs, TL cultivates a supportive climate for innovation, allowing employees to experiment and fail without fear (Ting *et al*., 2021). Based on the foregoing discussion, the following hypothesis is proposed.

2.2.2 Work Engagement and Innovation Performance

Several studies have demonstrated a relationship between WE and innovation (Rao & Weintraub, 2013). Specifically, Wang & Chen (2020) argued that innovation performance depends on employees' WE, which involves investing their emotional, cognitive, and social resources in their work, resulting in creative and innovative outcomes. According to Bakker and Xanthopoulou (2013), when employees are engaged in the workplace, they are more likely to engage in innovative activities that convert ideas into outputs. Kyoung Park *et al.* (2013) argue that WE effectiveness enables employees to experience positive emotions, which encourages them to be more open to creativity. This, in turn, strengthens their ability to innovate, leading to improved innovation performance through psychological work connection and commitment to high-performance standards (Ariyani & Hidayati, 2018).

Based on the work of Ghani *et al.* (2023), WE have a significant influence on innovation performance, as employees contribute fresh, original ideas and execute them to create innovative outcomes when engaged. With WE, employees can think outside the box and collaborate to innovate at both the individual and organisational levels (Vladić *et al*., 2021). Using data from Palumbo (2021) on European healthcare organisations, it was found that WE trigger innovation-oriented behaviours at work, thereby increasing employees' willingness to improve organisational processes and practices, potentially resulting in enhanced innovation performance. Arshi and Rao's (2019) results from SEM analysis of 400 firms in Oman showed that WE significantly predicts innovation. Hence, the third hypothesis is as follows:

2.2.3 Transformational Leadership and Work Engagement

Research has considered WE a "positive, fulfilling, work-related state of mind characterized by absorption, dedication, and vigour" (Schaufeli & Bakker, 2004). In which absorption is ''the ability to concentrate and be fully engrossed in one's work, whereby time passes intangibly'' (Schaufeli & Bakker, 2004). Dedication is "a sense of significance, enthusiasm, inspiration, pride, and challenge" (Schaufeli & Bakker, 2010, 2004). Vigour refers to "high energy levels and mental resilience while working, indicating a willingness even in the face of difficulties" (Schaufeli & Bakker, 2004). WE enables employees to be psychologically, emotionally, and physically invested in their work, thereby binding together employees' effort, commitment, and satisfaction (Huang *et al*., 2022). These engaged employees are motivated to achieve the firm's goals (Goyal *et al*., 2024).

Leadership behaviours have considerable influence on enhancing employees' WE (Mazzetti *et al*., 2023). Earlier research has shown a positive correlation between TL and work engagement, demonstrating that transformational leaders enhance employees' engagement by attaching meaning to their work (Lai *et al*., 2020), offering social support (Wang *et al*., 2023), and providing adequate resources. In the same vein, TLs create a supportive work environment where employees are empowered and have autonomy in their work execution (Chua & Oluremi, 2019).

Regarding the TL relationship with key elements of WE, some scholars have indicated that TL behaviours are associated with absorption, dedication, and vigour (Lai *et al*., 2020). They argued that TLs create a supportive environment and offer helpful, easily accessible resources, motivating employees to invest their energy in their tasks with absorption, vigour, and dedication. In recent studies, Nguyen *et al*. (2022) and Zhang *et al*. (2025) argued that TL is significantly associated with work engagement amongst Chinese Intensive Care Unit nurses. Their findings revealed that TL practices have a significant impact on subordinates' attitudes and relationships with colleagues, thereby increasing their engagement and dedication to their work (Gumusluoğlu & Ilsev, 2009). Based on the above discussion, this study proposes a positive relationship between TL and WE.

2.2.4 Mediating Role of Work Engagement

According to social exchange theory, reciprocity norms enhance WE and can produce positive organisational outcomes (Agarwal, 2014; Yin, 2018). Based on SET, WE plays a mediating role in the relationship between organisational resources and organisational outcomes (Cropanzano *et al*., 2017; Knight *et al*., 2017; Simbula *et al*.,

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2023). The leaders' transformational behaviour indicates an organisational resource towards WE (Breevaart & Bakker, 2018; Schmitt *et al*., 2016). The behaviour of transformational leaders — idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration — encourages followers to leverage their strengths and take personal initiative, thereby enhancing their WE (Bakker, 2022).

These engaged employees are motivated to achieve the firm's goals (Goyal *et al*., 2024). Relatedly, current literature supports the mediating role of WE in the relationship between leadership and innovation (Gui *et al*., 2024). For example, Ntseke *et al*. (2022) argued that leaders who articulate the organisation's vision, stimulate creativity, act as role models, develop followers, and are inspiring would enhance employees' dedication, work effort, and energy levels. Kassa and Tsigu (2022) highlighted that securing WE helps organisations because behaviours demonstrated by engaged employees lead to positive outcomes in customer satisfaction, operational efficiency, and revenue growth. Lai *et al.* (2020) emphasised that the significant influence of TL behaviours on WE could enhance an organisation's innovation performance.

Recent research by Gemeda and Lee (2020) reported that transformational leaders provide favorable conditions for WE to thrive, which, in turn, enhances the firm's ability to produce innovative outcomes (Barkat *et al*, 2024; Zheng, 2024). Jiatong *et al*. (2022) examined WE as a mediating construct in the connection between TL and job performance. Bakker *et al*. (2023) found that WE serves as a mediating factor in the relationship between TL and follower performance. In line with the above discussion, the researcher proposes the following hypotheses.

III. METHODOLOGY

3.1 Research Design

A quantitative explanatory research design using cross-sectional data was employed. The design provides a causal relationship among variables based on individual experiences at a given time point. Yamane's formula was used to draw a sample of 326 SMEs, representing 958 manufacturing firms, employing a multistage sampling approach. The small and medium enterprises were divided into proportionate strata to enable the enterprise selection. The researcher then used random numbers in Excel to generate a list of firms to sample, based on the list provided by the Uganda Manufacturers' Association (2024). The respondents who completed the survey were either the firm's owners or managers, considered knowledgeable and playing a key role in guiding the SMEs' strategic direction.

The research team physically contacted the sample firms through personal visits to deliver the structured questionnaire to the owners and managers. The focus on owner-managers of manufacturing firms as study respondents stems from their knowledge of SME operations and their crucial role in shaping SME strategy. Observed variables were used in this study, drawn from existing developed scales, to develop measures for the three latent factors. An expert review was conducted prior to formal data collection, involving four academic scholars and two industry experts who possessed a deep understanding of this research field.

Additionally, a pilot test was performed with 40 SMEs to fine-tune the survey items and validate the research instrument in this context. For the main study, 326 questionnaires were distributed to the respondents, and 308 responses were collected. From the received responses, 305 were considered usable for data analysis. The data analysed in this paper were collected from small and medium enterprises. We focused on manufacturing SMEs, as they are important for job creation/employment, revenue generation, and represent growth potential for Uganda. The researcher used SPSS 27 to run hierarchical regression analysis and PROCESS Macro 4.2 to analyse the data.

3.2 Variable Measurement

Transformational Leadership. To measure TL, the owner-managers' perceptions of their leadership behaviour were assessed using the Multifactor Leadership Questionnaire (MLQ)-5X, developed by Avolio and Bass (2004), comprising 20 items. A sample item is "The firm's management talks enthusiastically about what needs to be accomplished," ranging from 1 (to a very slight extent) to 7 (to an extreme extent).

WE. The 17-item scale by Schaufeli and Bakker (2010) and Barrick *et al*. (2015) was adapted to measure employees' WE at the organisational level. A sample item, "In this firm, my co-workers and I tend to be highly focused when doing our job," was assessed using a 7-point Likert-type scale, ranging from 1 (Never) to 7 (Always).

Innovation Performance. Innovation performance, as defined by the OECD (2005), used by Abdulai (2019), Kankisingi & Dhliwayo (2022), and Soto-Acosta *et al*. (2017), was measured in this study using 22 items that represent four dimensions. Owner-managers were asked to assess the extent to which their SMEs had recently utilized the gains from their innovations on a seven-point Likert scale, ranging from 1 (Very strongly disagree) to 7 (Very strongly agree). The illustrative item is "In the last three years, new products have resulted in increased sales".

Control Variables. Firm Characteristics, including firm age and firm size, were controlled for to account for firm differences that may impact innovation performance (Le & Lei, 2019). This aligns with prior research (e.g., Birasnav *et al*., 2013; Kireyeva *et al*., 2021). The number of full-time employees is a measure of firm size. The years

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since the firm's founding (Nadkarni & Hermann, 2010) represented the firm's age. Incorporating control variables ensured that these factors did not confound the observed relationships.

IV. FINDINGS & DISCUSSION

4.1 Preliminary Analyses

An exploratory factor analysis was conducted to determine whether the items converged into distinct factors. The reliability analysis revealed internal consistency, with Cronbach's alpha coefficients exceeding 0.70: IP = 0.848, TL = 0.837, and WE = 0.855. Validity was ascertained through convergent validity and discriminant validity. The average variance extracted (AVE), which measures convergent validity, was above 0.5 (Field, 2009; Hair *et al*., 2019), with IP at 0.637, TL at 0.651, and WE at 0.596. The Fornell-Larcker criterion (Fornell & Larcker, 1981) was used to establish discriminant validity, with the square roots of the AVEs (IP-0.798, TL-0.807, and WE-0.772) exceeding the correlations among the variables, as shown in Table 2.

A common-methods bias (CMB) analysis was conducted to determine whether the data were inflated or deflated by respondents. This arises from collecting data from the same respondents, which can create bias (Podsakoff *et al*., 2024). Harman's single-factor test, as recommended by Fuller *et al*. (2016), was done. The results indicated that the single factor accounted for 19.049%, which was below the maximum threshold of 50%, indicating that the CMB was non-existent.

Several regression diagnostics were performed to minimize erroneous results and enhance model robustness (Hair *et al*., 2020). Variance inflation factors (VIFs) were checked to assess multicollinearity. The VIF results for all study models were below 5 (Hair *et al*., 2019), with VIFs of TL = 1.050 and WE = 1.638. Therefore, multicollinearity did not affect our study.

4.2 Demographic Characteristics

The demographic characteristics of the participating sample are summarized in Table 1. The sample consisted of 161 participants (52.8%) who were male and 144 participants (47.2%) who were female. Of these, 38 (12.5%) were 30 years old or younger, 154 (50.5%) were between 30 and 40 years old, 93 (30.5%) were between 41 and 50 years old, and 20 (6.6%) were 51 years or older. Regarding participants' education, higher literacy levels were reported: 178 (58.4%) held a bachelor's degree, 76 (24.9%) held a postgraduate degree, and only 51 (16.7%) held a diploma. This demonstrates that owners and managers of manufacturing SMEs in Uganda possess high literacy levels. One hundred fifty-three participants (50.2%) had worked in the SMEs for 3-5 years, 57 (18.7%) had worked for 6-8 years, and 51 (16.7%) had worked for than 8 years. The classification defines small businesses as those with 5 to 49 permanent employees, and medium-sized businesses as those with 50 to 100 permanent employees. Statistics reported that 89 (29.2%) of the included firms were small, and 216 (70.8%) were medium, which aligns with the UMA business classification. Ninety-nine firms (30.2%) had existed for six or fewer years, and 213 firms (69.8%) had existed for more than 6 years.

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Table 1

Demographic profile of respondents and the Enterprises

Profile of Respondents			
Variable	**Factor**	**Frequency**	**Percent**
Gender	Male	161	52.8
	Female	144	47.2
Age	<30 years	38	12.5
	30 – 40 years	154	50.5
	41 – 50 years	93	30.5
	51 years & over	20	6.6
Education Level	Diploma	51	16.7
	Degree	178	58.4
	Masters	69	22.6
	PhD	7	2.3
Years in Enterprise	<3 years	44	14.4
	3 – 5 years	153	50.2
	6 – 8 years	57	18.7
	Above 8 years	51	16.7
Position	Top Management	226	74.1
	Business Owner	79	25.9
Profile of Enterprises			
Firm Age	1 – 3 years	11	3.6
	4 – 6 years	81	26.6
	7 – 9 years	58	19
	10 years and above	155	50.8
Firm Size	5 – 49 employees	89	29.2
	50 - 100 employees	216	70.8
Total		**305**	**100**

4.3 Descriptive Statistics

This study was set to identify and document TL, WE, and innovation performance from a developing country perspective. To summarize the data, means and standard deviations were used. TL (Mean=4.659, SD=0.786), WE (Mean=4.831, SD=0.798), and innovation performance (Mean=4.617, SD=0.732). These results indicate low variation relative to the mean, suggesting that the calculated means are highly representative of the data used (Field, 2009).

Table 2

Results for Mean, Standard Deviations, and Correlation Coefficients

Variable	**Mean**	**SD**	**IP**	**TL**	**WE**
IP	4.617	0.732	1		
TL	4.659	0.786	.535**	1	
WE	4.831	0.798	.485**	.561**	1

Note: N=305, **. Correlation is significant at the 0.01 level (2-tailed)

4.4 Hypotheses Testing

The first study hypothesis predicted a positive relationship between TL and innovation performance. A hierarchical multiple regression was run. Results in Table 3, Model 1, control variables were entered as the independent variable, and innovation performance as the dependent variable. Firm age ($\beta = 0.071$, $p < .001$) was found to be positively related to innovation performance. These results align with those of Birasnav *et al.* (2013); our findings confirm that as manufacturing SMEs age, their involvement in innovative activities increases. As reflected in Table 3, in Model 2, we controlled for the covariates and entered the independent TL. The findings show a statistically significant relationship between TL and innovation performance [$F(1, 301) = 109.089$, $p < 0.001$], with the model explaining 24.7% of the variance in innovation performance. The standardized Beta ($\beta = 0.504$) further supports a moderate positive effect of TL on IP. This shows that the first null hypothesis (H01) was rejected.

We hypothesized that WE does not have a positive relationship with innovation performance ($H_0 2$). As indicated in Model 3 of Table 3, WE is positively ($\beta = 0.247$) and significantly related to innovation performance [$F(1,300) = 19.229$, $p < 0.001$]. The model explained 4.1% variance in innovation performance. This implies that hypothesis two was not supported. A new hierarchical model was run to test the third hypothesis (H03) presented in Table 4. The results

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indicate that TL has a positive and significant effect on WE (β = 0.543, p < .001). Further, the results show that for every 1-unit change in TL, there is a 0.528-unit change in WE.

Table 3

Hierarchical Regression Results for H1 and H2

Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Change Statistics				
					R-squared Change	F Change	df1	df2	Sig F Change
1	0.267	0.071	0.065	0.89375	0.071	11.565	2	302	.000
2	0.564	0.318	0.311	0.76698	0.247	109.089	1	301	.000
3	0.599	0.359	0.351	0.74476	0.041	19.229	1	300	.000
Coefficients									
Model		**B**	**Std Error**	**β**	**t**	**Sig.**			
1	Constant	3.647	0.216		16.887	0.000			
	Firm age	0.243	0.005	0.248	4.407	0.000			
	Firm size	0.121	0.105	0.065	1.154	0.250			
2	Constant	1.632	0.268		6.099	0.000			
	Firm age	0.163	0.048	0.167	3.41	0.000			
	Firm size	0.093	0.09	0.050	1.029	0.304			
	TL	0.509	0.049	0.504	10.445	0.000			
3	Constant	1.099	0.287		3.833	0.000			
	Firm age	0.136	0.047	0.139	2.895	0.004			
	Firm size	0.097	0.088	0.052	1.107	0.269			
	TL	0.374	0.057	0.370	6.617	0.000			
	WE	0.256	0.058	0.247	4.385	0.000			

a Dependent Variable: Innovation Performance
Predictors: TL-Transformational leadership, WE-Work engagement

Table 4

Hierarchical Regression Results for H3

Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Change Statistics				
					R Square change	F Change	df1	df2	Sig F Change
1	0.202	0.041	0.035	0.87529	0.041	6.434	2	302	0.002
2	0.572	0.327	0.32	0.7345	0.286	127.87	1	301	0.000
Coefficients									
Model		**B**	**Std Error**	**β**	**t**	**Sig.**			
1	Constant	4.167	0.212		19.702	0			
	Firm age	0.189	0.054	0.201	3.512	0			
	Firm size	0.013	0.103	0.007	0.129	0.897			
2	Constant	2.078	0.256		8.108	0			
	Firm age	0.107	0.046	0.113	2.334	0.02			
	Firm size	-0.016	0.086	-0.009	0.187	0.852			
	TL	0.528	0.047	0.543	11.308	0			

a Dependent Variable: Work Engagement,
Predictor: Transformational leadership

In the fourth hypothesis, WE was not expected to mediate the relationship between transformational leadership and innovation performance. We employed the mediation procedures suggested by MacKinnon (2012). The four mediation requirements include that the independent variable (TL) must have a significant effect on the dependent variable (innovation performance), the mediator variable (WE) must have a significant effect on the dependent variable (innovation performance), the independent variable (TL) must have a significant effect on the mediator (WE), and lastly, a significant coefficient for the indirect path must be found from the independent variable to the dependent variable. Preacher and Hayes' Bootstrapping method was used to verify the magnitude and test the statistical significance of the indirect effect (Preacher & Hayes, 2004). Table 5 presents the statistical evidence supporting the requirements for the mediation model. According to this table, a positive and significant relationship exists between TL and WE (β = 0.528, p < .001), which satisfies the first requirement for the mediation model. Furthermore, a positive and significant

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relationship exists between WE and innovation performance (β = 0.256, p < .001), which satisfies the second condition for mediation. Additionally, a positive and significant relationship exists between TL and innovation performance (β = 0.509, p < .001), satisfying the requirements for the third condition. The last requirement was also satisfied as shown in Table 6, as the bootstrap results suggest a significant indirect effect (a1*b1) (β = 0.135, p<.001). These results indicate that WE partially mediates the link between TL and WE, as the indirect effect remained significant with the introduction of the mediator (β = 0.374, p < .001). Therefore, $H_0$4 was rejected.

Table 5

Mediation Analysis: Work Engagement as a Mediator

Model Summary	***R***	***R Square***	***MSE***	***F***	***df1***	***df2***	***p***
	.572	.327	.539	48.715	3	301	p<.001
	Model	**Coeff**	**SE**	***t***	***p***	**LLCI**	**ULCI**
	Constant	2.078	.256	8.108	p<.001	1.573	2.582
	TL	.528	.047	11.308	p<.001	.436	.620
	Firm age	.107	.046	2.334	p=0.02	.017	.197
	Firm size	-.016	.086	-.187	p=0.852	-.186	.154
Outcome variable: Work engagement							
Model Summary	***R***	***R Square***	***MSE***	***F***	***df1***	***df2***	***p***
	.599	.359	.555	42.059	4	300	p<.001
	Model	**Coeff**	**SE**	***t***	***p***	**LLCI**	**ULCI**
	Constant	1.099	.287	3.833	p<.001	.535	1.664
	TL	.374	.057	6.617	p<.001	.263	.485
	WE	.256	.058	4.385	p<.001	.141	.371
	Firm age	136	.047	2.895	p=0.004	.044	.228
	Firm size	.097	.088	1.107	p=0.269	-.075	.269
Outcome variable: Innovation performance							
Model Summary	***R***	***R Square***	***MSE***	***F***	***df1***	***df2***	***p***
	.564	.318	.588	46.833	3	301	p<.001
	Model	**Coeff**	**SE**	***t***	***p***	**LLCI**	**ULCI**
	Constant	1.632	.268	6.099	p<.001	1.105	2.158
	TL	.509	.049	10.445	p<.001	.413	.605
	Firm age	.163	.048	3.41	p=0.01	.069	.257
	Firm size	.093	.090	1.029	p=.304	-.085	.270

Outcome variable: Innovation performance

Note: N=305; LLCI=Lower Limit Confidence Interval, ULCI=Upper Limit Confidence Interval

Table 6

Mediation Analysis Summary

Relationship	**Total Effect**	**Direct Effect**	**Indirect Effect**	**Confidence Interval**		**t-statistics**	**Conclusion**
				Lower Bound	**Upper Bound**		
Transformational leadership→ Work engagement→ Innovation performance	0.509	0.374	0.135	0.073	0.206	10.445	Partial Mediation
	(0.000)	0.000					

4.5 Discussion

The study was purposed to understand the precursors of innovation performance by focusing on TL and work engagement. Hypothesis one anticipated a positive effect of TL on innovation performance. The collected data from manufacturing SMEs confirmed that TL is needed for improved innovation performance. These findings align with Tajasom *et al.'s* (2015) study, which found that the TL behaviours of owner-managers can effectively enhance innovation performance within SMEs. In a similar vein, Hoai *et al.* (2022) and Novitasari *et al.* (2021) recognised TL as pivotal to fostering innovation performance within an organisation. This study not only broadens the field of leadership and innovation performance but also incorporates WE within the same framework, thereby making a valuable

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contribution to research on WE as an antecedent of innovation performance. Findings in hypothesis two confirm a positive and significant relationship between WE and innovation performance. This corroborates with Vladić *et al*. (2021), who found that engaged employees can think outside the box and collaborate to innovate at both the individual and organisational levels.

The current study extends the Upper Echelons Theory. Earlier research has overly focused on the manager demographics, paying less attention to the behavioral aspects. Nevertheless, compared to demographic characteristics, leadership behaviour may reflect the owners' and managers' beliefs that shape the strategy of SMEs (innovation performance). Based on the upper echelons theory, results specify that TL behavioral aspects (Bosma *et al*., 2016) are imperative in influencing innovation performance as an organisational outcome. Based on Social Exchange Theory, this study established the indirect effect of WE on TL and innovation performance. Results show that the mediation hypothesis is supported, indicating that vigour, dedication, and absorption among SME employees are crucial for transformational owner-managers to promote innovation performance. This aligns with Barkat et al. (2024), who found that TL leads to increased employee engagement, thereby improving innovation outcomes.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study, therefore, underscores the empirical literature on innovation performance in Uganda, a developing country. This study concludes that TL and WE have significant potential in enhancing the innovation performance of manufacturing SMEs in GKMA, Uganda. Specifically, it concludes that TL is a better contextual factor explaining 24.7% of the variance in innovation performance. The findings complement the Upper Echelon Theory (UET), which assumes that TMT's characteristics, values, and dispositions influence organisational-level outcomes (Hambrick & Mason, 1984). Based on the upper echelons theory, our results suggest that the behaviours exhibited by transformational owner-managers of SMEs provide a vision for the innovation strategies to be adopted, leading to better innovation performance. The results also complement the Social Exchange Theory (SET) by highlighting the importance of social exchanges that foster positive, reciprocal relationships among leaders and employees in organisations. The findings imply that TL and WE offer an avenue for manufacturing SMEs to improve their financial viability through increased profits and revenues from innovation successes. Therefore, this would enable manufacturing SMEs to support the Sustainable Development Goals, the African Union Agenda 2030, and Uganda's NDP IV by reducing unemployment, improving innovation, and reducing income inequality. However, the modest explanatory power of TL and WE suggests that additional factors and targeted interventions are needed to improve the innovation performance of manufacturing SMEs.

5.2 Recommendations

This paper calls for targeted recommendations to improve innovation performance among manufacturing SMEs in Uganda. To the owners or managers, they need to ensure that there is individualized consideration for employees, have inspirational motivation and idealized influence, which orients employees toward the organization's vision. Owners and managers of manufacturing SMEs should undertake TL training, enabling them to lead with a clear vision and ensure WE, ultimately improving innovation performance within SMEs.

In addition, owners/ managers foster positive relations and collaboration among their SME employees. With such an environment, the SMEs' innovation strategies will be supported. Notably, increasing awareness among SME owners and managers of the numerous benefits of adopting TL may motivate them to move away from bureaucratic leadership tendencies. This shift could involve being individually considerate of employees, amplifying SMEs' visions, and modelling the required behaviour within SMEs, thereby engaging employees in SME work and improving innovation performance.

Results revealed a mediating role of WE in supporting leadership and organizational outcomes. Therefore, it is paramount for organisations to establish a conducive work atmosphere that upholds employees' WE. Specifically, owners/managers of SMEs can contribute to a supportive work environment by supporting employees, giving them autonomy, and providing positive feedback, which enhances rapport within the organisation and increases trust, thereby increasing WE. By aligning the owners/managers' leadership behaviour with the organisation's innovation goals, SMEs can not only have an engaged, vibrant, and dedicated workforce but also cultivate an innovation culture. Finally, the study findings align with these recommendations, highlighting that omitting TL and WE can hinder companies seeking to attain excellence in innovation performance. This research provides actionable insights that can empower SMEs to leverage TL effectively in their pursuit of innovation performance.

Data were obtained from manufacturing SMEs in GKMA, Uganda, which increases the probability of transferability to other countries. Future research may aim to extend the same study using different settings and samples. This study is further restricted to a single source. No archival data were used in the study, as all SMEs are privately owned. Future studies should utilize multiple sources and archival data to enhance the validity and accuracy of their findings.

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This study also used cross-sectional data, which limits understanding of innovation performance over time. Future researchers should use longitudinal studies to get insights into the dynamics of IP over time. In addition, this study employed cross-sectional empirical findings, which can be regarded as revealing correlations. Future research could employ a longitudinal study to capture changes in TL and WE and examine how these factors improve the innovation performance of manufacturing SMEs, thereby providing more robust evidence.

REFERENCES

Abdulai, A. F. (2019). Social capital and innovation performance in firms. In Brychan, C. T., & Lyndon, J. M. (Eds.), *Innovation and social capital in organizational ecosystems* (pp. 81–97). IGI Global Scientific Publishing. http://doi.org/10.4018/978-1-5225-7721-8.ch005

Adomako, S., & Nguyen, N. P. (2020). Human resource slack, sustainable innovation, and environmental performance of small and medium-sized enterprises in sub-Saharan Africa. *Business Strategy and the Environment, 29*(8), 2984–2994. https://doi.org/10.1002/bse.2552

Agarwal, A. U. (2014). Examining the impact of social exchange relationships on innovative work behaviour: Role of work engagement. *Team Performance Management, 20*(3/4), 102–120. https://doi.org/10.1108/TPM-01-2013-0004

Ahimbisibwe, G. M., Ecel, A., Nuwagaba, D., Nakigudde, R., Mpiriirwe, R. F., & Kiplangat, L. (2024). Innovation capabilities and international competitiveness of agro-processing firms in Uganda. *Competitiveness Review: An International Business Journal, 35*(5), 837–857. https://doi.org/10.1108/CR-04-2024-0079

Alblooshi, M., Shamsuzzaman, M., & Haridy, S. (2021). The relationship between leadership styles and organisational innovation: A systematic literature review and narrative synthesis. *European Journal of Innovation Management, 24*(2), 338–370. https://doi.org/10.1108/EJIM-11-2019-0339

Andersson, M., Moen, O., & Brett, P. O. (2020). The organizational climate for psychological safety: Associations with SMEs' innovation capabilities and innovation performance. *Journal of Engineering and Technology Management, 55*, 101554. https://doi.org/10.1016/j.jengtecman.2020.101554

Ariyani, N., & Hidayati, S. (2018). Influence of transformational leadership and work engagement on innovative behavior. *Etikonomi: Jurnal Ekonomi, 17*(2), 275–284. http://dx.doi.org/10.15408/etk.v17i2.7427

Arshi, T., & Rao, V. (2019). Assessing impact of employee engagement on innovation and the mediating role of readiness for innovation. *International Journal of Comparative Management, 2*(2), 174–202. https://doi.org/10.1504/IJCM.2019.100857

Avolio, B. J. (2004). Examining the full range model of leadership: Looking back to transform forward. In *Leader development for transforming organizations* (pp. 71–98). Psychology Press. https://www.taylorfrancis.com/chapters/edit/10.4324/9781410610102-6

Avolio, B. J., & Bass, B. M. (2004). Multifactor leadership questionnaire (TM). Mind Garden, Inc. https://www.mindgarden.com/attachments/article/313/MLQ.pdf

Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing, and organizational innovation. *Technology in Society, 66*, 101635. https://doi.org/10.1016/j.techsoc.2021.101635

Bakashaba, R., Musiita, B., & Nabachwa, S. (2024). Entrepreneurial networking and performance of Ugandan manufacturing SMEs: The mediating role of innovation capabilities. *Journal of Economics and Behavioral Studies, 16*(2), 87–98. https://doi.org/10.22610/jebs.v16i2(J).3838

Bakker, A. (2017). Strategic and proactive approaches to work engagement. *Organizational Dynamics, 46*(2), 67–75. https://doi.org/10.1016/j.orgdyn.2017.04.002

Bakker, A. B. (2022). The social psychology of work engagement: State of the field. *Career Development International, 27*(1), 36–53. https://doi.org/10.1108/CDI-08-2021-0213

Bakker, A. B., & Xanthopoulou, D. (2013). Creativity and charisma among female leaders: The role of resources and work engagement. *The International Journal of Human Resource Management, 24*, 2760–2779. https://doi.org/10.1027/1866-5888/a000085

Bakker, A. B., Hetland, J., Olsen, O. K., & Espevik, R. (2023). Daily transformational leadership: A source of inspiration for follower performance? *European Management Journal, 41*(5), 700–708.

Barkat, W., Waris, I., Ahmed, R., & Dad, M. (2024). Transformational leadership and frontline managers' work engagement, innovative work behavior, organizational citizenship behavior, and employee sustainability in the hotel industry in Pakistan. *Journal of Human Resources in Hospitality & Tourism, 23*(2), 315–336. https://doi.org/10.1080/15332845.2024.2282217

Barrick, M. R., Thurgood, G. R., Smith, T. A., & Courtright, S. H. (2015). Collective organizational engagement: Linking motivational antecedents, strategic implementation, and firm performance. *Academy of Management journal, 58*(1), 111-135.

Licensed Under Creative Commons Attribution (CC BY-NC)

Bass, B. M. (1990). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics, 18*(3), 19–31. https://doi.org/10.1016/0090-2616(90)90061-S

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Psychology Press.

Bass, B., & Avolio, B. (1994). *Improving organizational effectiveness through transformational leadership*. Sage.

Batrancea, L. M., Balcı, M. A., Chermezan, L., Akgüller, Ö., Masca, E. S., & Gaban, L. (2022). Sources of SMEs financing and their impact on economic growth across the European Union: Insights from a panel data study spanning sixteen years. *Sustainability, 14*(22), 15318. https://doi.org/10.3390/su142215318

Birasnav, M., Albufalasa, M., & Bader, Y. (2013). The role of transformational leadership and knowledge management processes on predicting product and process innovation: An empirical study developed in Kingdom of Bahrain. *Tékhne, 11*(2), 64–75. https://doi.org/10.1016/j.tekhne.2013.08.001

Blau, P. M. (1964). Exchange and power in social life. *Sociological Inquiry, 34*(2), 193–206.

Bosma, N., Schøtt, T., Terjesen, S. A., & Kew, P. (2016). *Global Entrepreneurship Monitor 2015 to 2016: Special topic report on social entrepreneurship*. SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2786949

Breevaart, K., & Bakker, A. B. (2018). Daily job demands and employee work engagement: The role of daily transformational leadership behavior. *Journal of Occupational Health Psychology, 23*(3), 338. https://doi.org/10.1037/ocp0000082

Chua, J., & Oluremi, A. (2019). Employees' self-determined motivation, transformational leadership, and work engagement. *Journal of Management & Organization, 27*(3), 1–21. https://doi.org/10.1017/jmo.2018.74

Cortes, A. F., & Herrmann, P. (2021). Strategic leadership of innovation: A framework for future research. *International Journal of Management Reviews, 23*(2), 224–243. https://doi.org/10.1111/ijmr.12246

Cortes, A. F., & Herrmann, P. O. L. (2020). CEO transformational leadership and SME innovation: The mediating role of social capital and employee participation. *International Journal of Innovation Management, 24*(3), 2050024. https://doi.org/10.1142/S1363919620500243

Cropanzano, R., & Mitchell, M. S. (2005). Social exchange theory: An interdisciplinary review. *Journal of Management, 31*(6), 874–900. https://doi.org/10.1177/0149206305279602

Cropanzano, R., Anthony, E. L., Daniels, S. R., & Hall, A. V. (2017). Social exchange theory: A critical review with theoretical remedies. *Academy of Management Annals, 11*(1), 479–516. https://doi.org/10.5465/annals.2015.0099

Cui, F., Lim, H., & Song, J. (2022). The influence of leadership style in China SMEs on enterprise innovation performance: The mediating roles of organizational learning. *Sustainability, 14*(6), 3249. https://doi.org/10.3390/su14063249

Dawa, S., Romijn, H., & Sutrisno, A. (2025). Opportunity recognition and innovation in Uganda: The moderating role of pluriactivity. *Journal of African Business, 26*(2), 330–350.

Dey, P. K., Malesios, C., De, D., Chowdhury, S., & Abdelaziz, F. B. (2020). The impact of lean management practices and sustainably-oriented innovation on sustainability performance of small and medium-sized enterprises: Empirical evidence from the UK. *British Journal of Management, 31*(1), 141–161. https://doi.org/10.1111/1467-8551.12388

Endris, E., & Kassegn, A. (2022). The role of micro, small, and medium enterprises (MSMEs) to the sustainable development of sub-Saharan Africa and its challenges: A systematic review of evidence from Ethiopia. *Journal of Innovation and Entrepreneurship, 11*(1), 20. https://doi.org/10.1186/s13731-022-00221-8

Eton, M., Mwosi, F., Okello-Obura, C., Turyehebwa, A., & Uwonda, G. (2021). Financial inclusion and the growth of small-medium enterprises in Uganda: Empirical evidence from selected districts in Lango sub-region. *Journal of Innovation and Entrepreneurship, 10*, 1–23. https://doi.org/10.1186/s13731-021-00168-2

Farida, I., & Setiawan, D. (2022). Business strategies and competitive advantage: The role of performance and innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 8*(3), 163. https://doi.org/10.3390/joitmc8030163

Ferreira, J., & Coelho, A. (2020). Dynamic capabilities, innovation, and branding capabilities and their impact on competitive advantage and SME performance in Portugal: The moderating effects of entrepreneurial orientation. *International Journal of Innovation Science, 12*(3), 255–286. https://doi.org/10.1108/IJIS-10-2018-0108

Field, A. (2009). *Discovering statistics using IBM SPSS statistics* (3rd ed.). Sage Publications.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50.

Fuller, C. M., Simmering, M. J., Atinc, G., Atinc, Y., & Babin, B. J. (2016). Common methods variance detection in business research. *Journal of Business Research, 69*(8), 3192–3198.

Gemeda, H. K., & Lee, J. (2020). Leadership styles, work engagement, and outcomes among information and communications technology professionals: A cross-national study. *Heliyon, 6*(4), e03699. https://doi.org/10.1016/j.heliyon.2020.e03699

Licensed Under Creative Commons Attribution (CC BY-NC)

Ghani, B., Hyder, S. I., Yoo, S., & Han, H. (2023). Does employee engagement promote innovation? The facilitators of innovative workplace behavior via mediation and moderation. *Heliyon, 9*(11), e09025. https://doi.org/10.1016/j.heliyon.2023.e21817

Gherghina, Ș. C., Botezatu, M. A., Hosszu, A., & Simionescu, L. N. (2020). Small and medium-sized enterprises (SMEs): The engine of economic growth through investments and innovation. *Sustainability, 12*(1), 347. https://doi.org/10.3390/su12010347

Goyal, K., Nigam, A., & Goyal, N. (2024). Employee engagement index: A graph-theoretic matrix approach. *Global Business and Organizational Excellence, 43*(5), 35–55. https://doi.org/10.1002/joe.22253

Gui, L., Lei, H., & Le, P. B. (2024). Fostering product and process innovation through transformational leadership and knowledge management capability: The moderating role of innovation culture. *European Journal of Innovation Management, 27*(1), 214–232. https://doi.org/10.1108/EJIM-02-2022-0063

Gumusluoğlu, L., & Ilsev, A. (2009). Transformational leadership and organizational innovation: The roles of internal and external support for innovation. *Journal of Product Innovation Management, 26*(3), 264–277. https://doi.org/10.1111/j.1540-5885.2009.00657.x

Hair Jr, J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research, 109*, 101–110. https://doi.org/10.1016/j.jbusres.2019.11.069

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hambrick, D. C. (2007). Upper echelons theory: An update. *Academy of Management Review, 32*(2), 334–343. https://doi.org/10.5465/amr.2007.24345254

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review, 9*(2), 193–206. https://doi.org/10.5465/amr.1984.4277628

Hanaysha, J. R., Al-Shaikh, M. E., Joghee, S., & Alzoubi, H. M. (2022). Impact of innovation capabilities on business sustainability in small and medium enterprises. *FIIB Business Review, 11*(1), 67–78. https://doi.org/10.1177/23197145211042232

Hanifah, H., Halim, H. A., Ahmad, N. H., & Vafaei-Zadeh, A. (2020). Can internal factors improve innovation performance via innovation culture in SMEs? *Benchmarking: An International Journal, 27*(1), 382–405. https://doi.org/10.1108/BIJ-06-2018-0174

Heider, A., Gerken, M., van Dinther, N., & Hülsbeck, M. (2021). Business model innovation through dynamic capabilities in small and medium enterprises – Evidence from the German Mittelstand. *Journal of Business Research, 130*, 635–645. https://doi.org/10.1016/j.jbusres.2020.04.051

Hervás-Oliver, J. L., Parrilli, M. D., Rodríguez-Pose, A., & Sempere-Ripoll, F. (2021). The drivers of SME innovation in the regions of the EU. *Research Policy, 50*(9), 104316. https://doi.org/10.1016/j.respol.2021.104316

Hilton, S. K., Madilo, W., Awaah, F., & Arkorful, H. (2023). Dimensions of transformational leadership and organizational performance: The mediating effect of job satisfaction. *Management Research Review, 46*(1), 1–19. https://doi.org/10.1108/MRR-02-2021-0152

Hoai, T. T., Hung, B. Q., & Nguyen, N. P. (2022). The impact of internal control systems on the intensity of innovation and organizational performance of public sector organizations in Vietnam: The moderating role of transformational leadership. *Heliyon, 8*(2), e08954. https://doi.org/10.1016/j.heliyon.2022.e08954

Hoang, G., Wilson-Evered, E., & Lockstone-Binney, L. (2021). Leaders influencing innovation: A qualitative study exploring the role of leadership and organizational climate in Vietnamese tourism SMEs. *Employee Relations: The International Journal, 43*(2), 416–437. https://doi.org/10.1108/ER-07-2019-0279

Huang, S. Y., Huang, C. H., & Chang, T. W. (2022). A new concept of work engagement theory in cognitive engagement, emotional engagement, and physical engagement. *Frontiers in Psychology, 12*, 663440. https://doi.org/10.3389/fpsyg.2021.663440

Issau, K., Acquah, I. S. K., Gnankob, R. I., & Hamidu, Z. (2021). Innovation orientation and performance of small and medium-sized enterprises (SMEs) in Ghana: Evidence from manufacturing sector. *Innovation & Management Review, 19*(4), 290–305.

Jiatong, W., Wang, Z., Alam, M., Murad, M., Gul, F., & Gill, S. A. (2022). The impact of transformational leadership on affective organizational commitment and job performance: The mediating role of employee engagement. *Frontiers in Psychology, 13*, 831060. https://doi.org/10.3389/fpsyg.2022.831060

Jjagwe, R., Kirabira, J. B., Mukasa, N., & Amanya, L. (2024). The drivers and barriers influencing the commercialization of innovations at research and innovation institutions in Uganda: A systemic, infrastructural, and financial approach. *Journal of Innovation and Entrepreneurship, 13*(1), 78.

Kagere, B. R., Kilimani, N., & Mwebaze, T. (2025). Product innovation strategies in low-resource contexts: Insights from Uganda. *Innovation and Development*, 1–25. https://doi.org/10.1080/2157930X.2025.2490343

Kankisingi, G. M., & Dhliwayo, S. (2022). Rewards and innovation performance in manufacturing small and medium enterprises (SMEs). *Sustainability, 14*(3), 1737. https://doi.org/10.3390/su14031737

Licensed Under Creative Commons Attribution (CC BY-NC)

Kaplinsky, R., & Kraemer-Mbula, E. (2022). Innovation and uneven development: The challenge for low- and middle-income economies. *Research Policy, 51*(2), 104394. https://doi.org/10.1016/j.respol.2021.104394

Kassa, A. G., & Tsigu, G. T. (2022). Corporate entrepreneurship, employee engagement, and innovation: A resource-based view and a social exchange theory perspective. *International Journal of Organizational Analysis, 30*(6), 1694–1711. https://doi.org/10.1108/IJOA-05-2020-2172

Kireyeva, A., Nurbatsin, A., Yessentay, A., Bagayeva, N., & Sharbanu, T. (2021). Exploring determinants of innovation potential of enterprises in Kazakhstan. *Problems and Perspectives in Management, 19*(2), 433–443. http://dx.doi.org/10.21511/ppm.19(2).2021.34

Knight, C., Patterson, M., & Dawson, J. (2017). Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *Journal of Organizational Behavior, 38*(6), 792–812. https://doi.org/10.1002/job.2167

Kwon, K., & Kim, T. (2020). An integrative literature review of employee engagement and innovative behavior: Revisiting the JD-R model. *Human Resource Management Review, 30*(2), 100704. https://doi.org/10.1016/j.hrmr.2019.100704

Kyoung Park, Y., Hoon Song, J., Won Yoon, S., & Kim, J. (2013). Learning organization and innovative behavior: The mediating effect of work engagement. *European Journal of Training and Development, 38*(1–2), 75–94.

Lai, F.-Y., Tang, H.-C., Lu, S.-C., Lee, Y.-C., & Lin, C.-C. (2020). Transformational leadership and job performance: The mediating role of work engagement. *SAGE Open, 10*(1), 2158244019899085. https://doi.org/10.1177/2158244019899085

Le, P. B., & Lei, H. (2019). Determinants of innovation capability: The roles of transformational leadership, knowledge sharing, and perceived organizational support. *Journal of Knowledge Management, 23*(3), 527–547. https://doi.org/10.1108/JKM-09-2018-0568

Lei, H., Leaungkhamma, L., & Le, P. B. (2020). How transformational leadership facilitates innovation capability: The mediating role of employees' psychological capital. *Leadership & Organization Development Journal, 41*(4), 481–499. https://doi.org/10.1108/LODJ-06-2019-0245

Li, W. D., Arvey, R. D., Zhang, Z., & Song, Z. (2012). Do leadership role occupancy and transformational leadership share the same genetic and environmental influences? *The Leadership Quarterly, 23*(2), 233–243. https://doi.org/10.1016/j.leaqua.2011.08.007

MacKinnon, D. (2012). *Introduction to statistical mediation analysis*. Routledge. https://doi.org/10.4324/9780203809556

Mazzetti, G., Robledo, E., Vignoli, M., Topa, G., Guglielmi, D., & Schaufeli, W. B. (2023). Work engagement: A meta-analysis using the job demands-resources model. *Psychological Reports, 126*(3), 1069–1107. https://doi.org/10.1177/00332941211051988

Melo, I. C., Queiroz, G. A., Junior, P. N. A., de Sousa, T. B., Yushimito, W. F., & Pereira, J. (2023). Sustainable digital transformation in small and medium enterprises (SMEs): A review on performance. *Heliyon, 9*(3), e13908. https://doi.org/10.1016/j.heliyon.2023.e13908

Mokhber, M., Khairuzzaman, W., & Vakilbashi, A. (2018). Leadership and innovation: The moderator role of organizational support for innovative behaviors. *Journal of Management & Organization, 24*(1), 108–128. https://doi.org/10.1017/jmo.2017.26

Molina-Morales, F. X., García-Villaverde, P. M., & Parra-Requena, G. (2014). Geographical and cognitive proximity effects on innovation performance in SMEs: A way through knowledge acquisition. *International Entrepreneurship and Management Journal, 10*(2), 231–251. https://doi.org/10.1007/s11365-011-0214-z

Monje-Amor, A., Vázquez, J. P. A., & Faíña, J. A. (2020). Transformational leadership and work engagement: Exploring the mediating role of structural empowerment. *European Management Journal, 38*(1), 169–178. https://doi.org/10.1016/j.emj.2019.06.007

Mugisha, F. A., & Ijjo, A. T. (2022). Business innovations as pathways for small and medium manufacturing enterprise resilience in Kampala, Uganda. *International Journal of Management Science and Business Administration, 1*(1), 1–19. https://www.cavendish.ac.ug/wp-content/uploads/2022/09

Mulumba, O., Kinengyere, A. A., Rugambwa, N. O., Okullo, I., Okaka, D. O., Ojulong, A., Eron, L., & Emong, P. (2023). Analysis of the national innovation system in Uganda. *African Higher Education Leadership in Advancing Inclusive Innovation for Development Project, 585919-EPP-1-2017-1-RO-EPPKA2-CBHE-JP*. https://www.researchgate.net/publication/339068370

Nadkarni, S., & Herrmann, P. O. L. (2010). CEO personality, strategic flexibility, and firm performance: The case of the Indian business process outsourcing industry. *Academy of Management Journal, 53*(5), 1050–1073. https://doi.org/10.5465/amj.2010.54533196

Nani, D. A., & Safitri, V. A. D. (2021). Exploring the relationship between formal management control systems, organizational performance, and innovation: The role of leadership characteristics. *Asian Journal of Business and Accounting, 14*(1), 207–224. https://doi.org/10.22452/ajba.vol14no1.8

Licensed Under Creative Commons Attribution (CC BY-NC)

Nduhura, T., Ssempebwa, A. M. B., Wicky, B. A., & Byamugisha, P. (2022). Contribution of innovation towards the competitive advantage of printing SMEs within Kampala Central Business District. *International Journal of Academic Management Science Research, 9*, 136–153.

Nguyen, N. T., Hooi, L. W., & Avvari, M. V. (2023). Leadership styles and organisational innovation in Vietnam: Does employee creativity matter? *International Journal of Productivity and Performance Management, 72*(2), 331–360. https://doi.org/10.1108/IJPPM-10-2020-0563

Nguyen, T. N., Shen, C. H., & Le, P. B. (2022). Influence of transformational leadership and knowledge management on radical and incremental innovation: The moderating role of collaborative culture. *Kybernetes, 51*(7), 2240–2258. https://doi.org/10.1108/K-12-2020-0905

Novitasari, D., Supiana, N., Supriatna, H., Fikri, M. A. A., & Asbari, M. (2021). The role of leadership on innovation performance: Transactional versus transformational style. *JIMFE (Jurnal Ilmiah Manajemen Fakultas Ekonomi), 7*(1), 27–36. https://journal.unpak.ac.id/index.php/jimfe

NPA. (2020). *National Planning Authority: Annual performance report FY 2019/20*. https://www.npa.go.ug/wp-content/uploads/2023/09/Annual-Report-FY-2019_20_compressed.pdf

Ntseke, T., Mitonga-Monga, J., & Hoole, C. (2022). Transformational leadership influences on work engagement and turnover intention in an engineering organisation. *SA Journal of Human Resource Management, 20*, 1–13. https://hdl.handle.net/10520/ejc-sajhrm_v20_n1_a2013

Oduro, S. (2020). Exploring the barriers to SMEs' open innovation adoption in Ghana: A mixed research approach. *International Journal of Innovation Science, 12*(1), 21–51. https://doi.org/10.1108/IJIS-11-2018-0119

OECD. (2005). *Oslo manual: The measurement of scientific and technological activities: Guidelines for collecting and interpreting innovation data* (3rd ed.). OECD Publications.

Osborne, S., & Hammoud, M. S. (2017). Effective employee engagement in the workplace. *International Journal of Applied Management and Technology, 16*(1), 4. https://doi.org/10.5590/IJAMT.2017.16.1.04

Palumbo, R. (2021). Engaging to innovate: An investigation into the implications of engagement at work on innovative behaviors in healthcare organizations. *Journal of Health Organization and Management, 35*(8), 1025–1045. https://doi.org/10.1108/JHOM-02-2021-0072

Peng, J. C., & Chen, S. W. (2023). Learning climate and innovative creative performance: Exploring the multi-level mediating mechanism of team psychological capital and work engagement. *Current Psychology, 42*(15), 13114–13132. https://doi.org/10.1007/s12144-021-02617-3

Podsakoff, P. M., Podsakoff, N. P., Williams, L. J., Huang, C., & Yang, J. (2024). Common method bias: It's bad, it's complex, it's widespread, and it's not easy to fix. *Annual Review of Organizational Psychology and Organizational Behavior, 11*(1), 17–61.

Pomegbe, W. W. K., Li, W., Dogbe, C. S. K., & Otoo, C. O. A. (2020). Enhancing the innovation performance of small and medium-sized enterprises through network embeddedness. *Journal of Competitiveness, 12*(3), 156. https://doi.org/10.7441/joc.2020.03.09

Prajogo, D. I., & Sohal, A. S. (2006). The integration of TQM and technology/R&D management in determining quality and innovation performance. *Omega, 34*(3), 296–312. https://doi.org/10.1016/j.omega.2004.11.004

Prasad, B., & Junni, P. (2016). CEO transformational and transactional leadership and organizational innovation: The moderating role of environmental dynamism. *Management Decision, 54*(7), 1542–1568. https://doi.org/10.1108/MD-11-2014-0651

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*(4), 717–731. https://doi.org/10.3758/BF03206553

Radicic, D., & Petković, S. (2023). Impact of digitalization on technological innovations in small and medium-sized enterprises (SMEs). *Technological Forecasting and Social Change, 191*, 122474. https://doi.org/10.1016/j.techfore.2023.122474

Rao, J., & Weintraub, J. (2013). How innovative is your company's culture? *MIT Sloan Management Review*, 54(3), 29–37.

Sawaean, F., & Ali, K. (2020). The impact of entrepreneurial leadership and learning orientation on organizational performance of SMEs: The mediating role of innovation capacity. *Management Science Letters, 10*(2), 369–380.

Schaufeli, W. B. (2013). What is engagement? In C. Truss, K. Alfes, R. Delbridge, A. Shantz, & Soane, E. (Eds.), *Employee engagement in theory and practice*. Routledge.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior, 25*(3), 293–315.

Schaufeli, W. B., & Bakker, A. B. (2010). Defining and measuring work engagement: Bringing clarity to the concept. In *Work engagement: A handbook of essential theory and research* (pp. 10–24). Psychology Press.

Licensed Under Creative Commons Attribution (CC BY-NC)

Schmitt, A., Den Hartog, D. N., & Belschak, F. D. (2016). Transformational leadership and proactive work behaviour: A moderated mediation model including work engagement and job strain. *Journal of Occupational and Organizational Psychology, 89*(3), 588–610. https://doi.org/10.1111/joop.12143

Simbula, S., Margheritti, S., & Avanzi, L. (2023). Building work engagement in organizations: A longitudinal study combining social exchange and social identity theories. *Behavioral Sciences, 13*(2), 83. https://doi.org/10.3390/bs13020083

Soto-Acosta, P., Popa, S., & Palacios-Marqués, D. (2017). Social web knowledge sharing and innovation performance in knowledge-intensive manufacturing SMEs. *The Journal of Technology Transfer, 42*(2), 425–440. https://doi.org/10.1007/s10961-016-9498-z

Sserunjogi, B., Sunday, N., Lakuma, P., & Kahunde, R. (2022). Employment and productivity of Uganda's SMEs in the face of COVID-19: A gender perspective. In *Socioeconomic shocks and Africa's development agenda* (pp. 123–134). Routledge.

Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic growth, increasing productivity of SMEs, and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 20. https://doi.org/10.3390/joitmc7010020

Tajasom, A., Hung, D. K. M., Nikbin, D., & Hyun, S. S. (2015). The role of transformational leadership in innovation performance of Malaysian SMEs. *Asian Journal of Technology Innovation, 23*(2), 172–188. https://doi.org/10.1080/19761597.2015.1074513

Tidd, J. (2023). Managing innovation. In G. Gustavo, E. K., Marina, D., & Roberto, S. (Eds.), *IEEE Technology and Engineering Management Society Body of Knowledge (TEMSBOK)* (pp. 95–108). Wiley. https://doi.org/10.1002/9781119987635.ch6

Ting, I. W. K., Sui, H. J., Kweh, Q. L., & Nawanir, G. (2021). Knowledge management and firm innovative performance with the moderating role of transformational leadership. *Journal of Knowledge Management, 25*(8), 2115–2140. https://doi.org/10.1108/JKM-08-2020-0629

Uganda Manufacturer's Association Directory. (2024). *As of May 21, 2024*. https://uma.or.ug/download/uma-business-directory-2023/

Van Tuin, L., Schaufeli, W. B., & Van den Broeck, A. (2021). Engaging leadership: Enhancing work engagement through intrinsic values and need satisfaction. *Human Resource Development Quarterly, 32*(4), 483–505. https://doi.org/10.1002/hrdq.21430

Van Zyl, L. E., van Oort, A., Rispens, S., & Olckers, C. (2021). Work engagement and task performance within a global Dutch ICT consulting firm: The mediating role of innovative work behaviors. *Current Psychology, 40*(8), 4012–4023. https://doi.org/10.1007/s12144-019-00339-1

Vives, A. (2022). Social and environmental responsibility in small and medium enterprises in Latin America. In *Corporate Citizenship in Latin America: New Challenges for Business* (pp. 39–50). Routledge. https://doi.org/10.4324/9781351288484

Vladić, N., Maletič, D., & Maletič, M. (2021). Determinants of innovation capability: An exploratory study of inclusive leadership and work engagement. *Quality Innovation Prosperity, 25*(2), 130–152. https://doi.org/10.12776/qip.v25i2.1596

Wang, C. H., & Chen, H. T. (2020). Relationships among workplace incivility, work engagement, and job performance. *Journal of Hospitality and Tourism Insights, 3*(4), 415–429. https://doi.org/10.1108/JHTI-09-2019-0105

Wang, G., Li, J., Liu, H., & Zaggia, C. (2023). Transformational leadership and teachers' voice behavior: A moderated mediation model of group voice climate and team psychological safety. *Educational Management Administration & Leadership*. https://doi.org/10.1177/17411432221143452

WIPO. (2024). *World Intellectual Property Report 2024: Making innovation policy work for development*. https://www.wipo.int/publications/en/details.jsp?id=4724

Wu, L., Sun, L., Chang, Q., Zhang, D., & Qi, P. (2022). How do digitalization capabilities enable open innovation in manufacturing enterprises? A multiple case study based on resource integration perspective. *Technological Forecasting and Social Change, 184*, 122019. https://doi.org/10.1016/j.techfore.2022.122019

Yang, J., Ying, L., & Gao, M. (2020). The influence of intelligent manufacturing on financial performance and innovation performance: The case of China. *Enterprise Information Systems, 14*(6), 812–832. https://doi.org/10.1080/17517575.2020.1746407

Yikilmaz, I., & Cekmecelioglu, H. G. (2023). Organizational agility as a key driver of innovation performance in SMEs and large enterprises. In *New perspectives and possibilities in strategic management in the 21st century: Between tradition and modernity* (pp. 209–238). IGI Global.

Yin, N. (2018). The influencing outcomes of job engagement: An interpretation from the social exchange theory. *International Journal of Productivity and Performance Management, 67*(5), 873–889. https://doi.org/10.1108/IJPPM-03-2017-0054

Licensed Under Creative Commons Attribution (CC BY-NC)

Zhang, L., Han, L., Liang, X., Wang, R., Fan, H., Jia, Y., Li, S., & Jiang, X. (2025). The relationship between transformational leadership and work engagement among intensive care unit nurses: The mediating function of organizational climate. *BMC Nursing*, *24*(1), 398. https://doi.org/10.1186/s12912-025-03057-1

Zheng, X. (2024). How does a firm's digital business strategy affect its innovation performance? An investigation based on knowledge-based dynamic capability. *Journal of Knowledge Management*, *28*(8), 2324–2356. https://doi.org/10.1108/JKM-05-2023-0410

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Effect of teachers' professional knowledge and practice on pupils' learning outcomes in public primary schools in Kakamega County, Kenya

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ABSTRACT

In the year 2012, the Teachers Service Commission (TSC) in Kenya launched the Performance Contract (PC) policy in the teaching service. Teacher PC was launched to correct the failure by the Ministry of Education to achieve targets outlined in the Kenya Education Sector Support Project (KESSP) of 2005-2010. Appraisals of the PCs are guided by predetermined set targets using the Teacher Professional and Development (TPAD) tool. Despite PC having been in place over the last thirteen years, there has been little change in learning outcomes in Kakamega County public primary schools. The purpose of the study was to establish the effect of teachers' achievement in professional knowledge and practice PC target on pupils' learning outcomes. The learning outcomes examined were academic achievement (Kenya Certificate of Primary Education-KCPE), pupil retention rates and pupil completion rates. This study was guided by the New Public Management (NPM) theory. A correlational research design with a mixed-methods approach was adopted for the study. Eighty-two (82) schools were selected from the 13 sub-counties of Kakamega County using multistage random sampling. Four key informants involved in Teacher PC supervision (2 Curriculum Support Officers, one Sub-County TSC Director and the County TSC Director) were also purposefully selected and interviewed. Structured questionnaires were used to collect data from the head teachers and teachers in the selected schools. The professional knowledge and practice PC target achievement scores and learning outcome scores over the past six years (2018-2023) were obtained from the selected schools and the records at the County Ministry of Education office. Quantitative data collected was analysed using descriptive statistics, Pearson's correlation and multilinear regression analysis. Qualitative data was analysed thematically using the NVivo 14 software. The results showed that only 39% of the teachers achieved good professional knowledge and practice PC target scores (>74.5%). The associations between achievement in professional knowledge and practice with learning outcomes were poor (KCPE performance: r=.159; P= 0.7640; retention rates: r= 0.285; p=0.585; completion rates: r=-0.079; p=0.061). The linear regression models revealed weak, statistically insignificant relationships for all the learning outcomes (P>0.05). Further analysis showed that the majority (78.1%) of the teachers had a poor attitude towards the PC initiative and disagreed with regular PC assessment. The study concluded that teacher achievement in professional knowledge and practice PC target did not meaningfully predict KCPE performance among the sample schools. The study recommends TSC should review the appraisal questions on professional knowledge and practice to ensure they are comprehensive and effective in enhancing pupil learning outcomes. There is a need for further research to establish the effect of teachers' professional knowledge such as subject-specific pedagogy on other pupil learning outcomes such as creativity, problem-solving and communication skills.

Keywords: Learning Outcomes, Professional Knowledge, Performance Contracts, Target Achievement

I. INTRODUCTION

Globally, Performance Contracting (PC) is used as a component of a broader set of public-sector management tools aimed at increasing efficiency and effectiveness in service delivery. Performance Contracting (PC) is a negotiated management tool used to measure performance against predetermined goals and targets (Hallinger, *et al*., 2014). Once the targets are set, employees then direct their efforts toward achieving the targets. The aim of introducing PC in the teaching service, as in other sectors of service delivery, was to improve teacher performance to provide quality education. However, there are conflicting reports regarding the effectiveness of PCs in enhancing the quality of education (Jensen, 2011; Hallinger *et al*., 2014; Darling Hammond *et al*., 2020; Camilleri, 2021).

Teacher efficiency in the teaching service has been and is still largely measured through teacher appraisals. In Kenya, PC in the teaching service is a new concept having started a decade ago. Long before PCs were formally introduced in public service, teacher appraisals were already in place. Teacher appraisals were carried out through

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inspection, with regular evaluations of schools and teachers by school inspectors. A confidential report would then be sent to TSC by the school's head teacher along with a teacher evaluation. Teachers were not given any specific PCs targets back then (Omondi, 2015).

The framework for PC in the teaching service is anchored in Section 11 (c) and (f) of the Teachers Service Commission (TSC) Act (2012), which makes provisions for monitoring teacher conduct and performance in public learning institutions (Government of Kenya [GOK], 2012). Unlike previous school inspections, performance targets and evaluation standards are established in a participatory and democratic manner between the supervisor and the teacher. In the year 2016, TSC introduced the 'Teacher Performance Appraisal and Development (TPAD) tool to appraise teacher performance in primary and secondary schools. On the TPAD tool, teachers are evaluated on five set performance targets of professional knowledge and practice, comprehensive learning environment, professional development, teacher conduct and professionalism and participation in professional learning community (TSC, 2017). Achievement in the targets was presumed to translate into effective teacher performance and subsequently into good learning outcomes. However, despite PCs have been in place in the teaching service for the last thirteen years, the effect the PCs on learning outcomes are still not clear. The learning outcomes have remained relatively unchanged in Kakamega County in Western Kenya. There are also still reports of teacher indiscipline and absenteeism, poor academic achievement, learners dropping out of school and learner indiscipline (Table 1 and Table 2).

Table 1

Learning Outcomes of Kakamega County Public Primary Schools over the Period 2018-2023

Year	2018	2019	2020	2021	2022	2023
Mean score (out of 500 Marks)	248	249.6	264	255.7	261.2	257.8
Pupil Retention rates (%)	75.2	81.4	83.6	81.4	83.3	82.7
Pupil Completion rates (%)	82.6	84.5	81.4	84.6	83.2	84.1

Source: Kakamega County Education Office (2023)

Table 2

Number of Primary School Teacher Discipline Cases Reported Over the Period 2018-2023 in Kakamega County

Discipline Case	Year					
	2018	2019	2020	2021	2022	2023
Desertion of duty	32	30	10	6	26	29
Absenteeism	15	13	6	-		21
Alcohol abuse	15	18	-	18	18	16
Insubordination	23	18	-	11	12	24
Sexual Molestation of learners	59	64	7	23	46	49
Others	13	9	-	10	-	13
Totals	**157**	**152**	**23**	**68**	**129**	**152**

Source: Kakamega County TSC Unit (2023)

The purpose of the study was to establish the effect of teachers' achievement in the professional knowledge and practice PC target on pupils' learning outcomes in public primary schools in Kakamega County. The professional knowledge and practice target is evaluated using the criteria of mastery of the subject content and use appropriate instructional methods, effective utilization of teaching/ learning resources, ability to carry out learner assessment, feedback and reporting on learners' learning and ability to access, ability to retrieve and integrate Information, Communication and Technology (ICT) in teaching and learning. Other criteria include preparation of schemes of work and lesson plans, lesson attendance, observation in class and effective use of time in class, preparation and maintenance of learner's progress records and whether teachers follow the laid down syllabus. These criteria are evaluated as guided by the 'Teacher Performance Appraisal and Development (TPAD) tool and scored out of 100. The Head of school determines the annual average score for all the teachers and posts the score on the TSC website using a password given by TSC. The learning outcomes examined included pupil academic achievement, pupil retention rates and pupil completion rates. The study used Kenya Certificate of Primary Education (KCPE) examination mean scores as a measure of academic achievement.

1.1 Statement of the Problem

A key government strategy to enhance education quality and teacher performance is the TSC's Performance Contract (PC) policy, launched in 2012 following reports by the Kenya Education Sector Support Project (KESSP). This policy, supported by the TSC Act (2012) and the Teacher Performance Appraisal and

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Development (TPAD) tool introduced in 2016, aims to review teaching standards, evaluate performance, and promote professional development. This is further envisioned in the National Education Sector Strategic Plan (NESSP) (2018-2022), which seeks to improve learning outcomes, access, affordability, and service delivery, focusing on enhancing teaching quality and teacher management. Despite these efforts, challenges still persist, particularly concerning the learning outcomes.

In Kakamega County, pupil learning outcomes have shown stagnation with slight fluctuations over recent years. For instance, the mean Kenya Certificate of Primary Education (KCPE) scores in Kakamega County public primary schools have hovered around 250, with 251.27 in 2018 and 250.04 in 2023. Similarly, pupil retention rates remained around 88% (e.g., 87.6% in 2018 and 88.2% in 2023), and completion rates around 91% (e.g., 91.2% in 2018 and 91.3% in 2023). This indicates that the effect of PC on learning outcomes in Kakamega County is not yet clear, and performance in the education sector has notably declined.

Teacher Performance Contracts involve evaluating teachers across five areas: professional knowledge, learning environment, professional development, conduct and professionalism, and participation in professional learning communities. This study therefore provides valuable insights to the TSC by examining the actual effectiveness of PC on pupils' learning outcomes. The study aimed to identify existing gaps in professional knowledge and practice target achievement and learning outcomes, proposing strategies to improve PC as a strategy for ensuring quality education.

1.2 Research Hypothesis

Teachers' achievement in professional knowledge and practice PC target has no effect pupils learning outcomes in public primary schools in Kakamega County in Kenya'

II LITERATURE REVIEW

2.1 Theoretical Review

Performance contracting is an application of various theoretical bodies of knowledge to improve organizational performance. As a result, many theories from different disciplines have been advanced to support and explain the performance contracting paradigm. This study was guided by the New Public Management (NPM) theory. According to Hood (2012), NPM is a series of themes relating to reforming the public sector's organization and procedures to make it more competitive and efficient in resource use and service delivery. The NPM is associated with the various reforms initiated in the public sector to improve accountability and maximize the use of scarce resources in the provision of public goods and services. There is agreement among scholars who have studied performance contracting that PC is one of the reforms that have been initiated under NPM, whose main focus is making the government more efficient by using less to produce more (Mutahaba, 2011).

In the context of the current study, TSC has created a New Public Management movement of PC to make the teaching service more efficient. Though many theories have been used to explain performance management, the researcher is convinced that the NPM mentioned above adequately covers the concepts in teacher performance contracting. Performance contracting practices and innovations are routine activities used by institutions to achieve set Visions, Missions, objectives, and targets. In the case of this study, teacher achievement of set targets and students' learning outcomes are all

2.2 Empirical Literature review

Several studies have reported a positive relationship between teacher professionalism and learning outcomes (Skaalvik & Skaalvik, 2020; Perry et al. 2021; Beach et al. 2021). The argument in these studies is that teacher professionalism and practice influences teachers' performance in the classroom by providing teachers with new information, techniques, tools, and instructional strategies that they can use to connect with and engage their students. However, in these studies, the linkage between professionalism and teaching practice to performance contracting in the teaching service and learning outcomes has not been investigated. The aim of performance contracting was mainly to improve on teacher professional competence. Teacher professional competence significantly improves teacher performance and pupil learning outcomes by enhancing teachers' knowledge, pedagogical skills, and professional attitudes (Popova et al., 2022). Ideally, teacher professional competence should enable teachers to plan and deliver lessons effectively, manage classrooms better, and adapt teaching methods to diverse student needs, thereby fostering improved student engagement and learning outcomes. However, in many schools including those in the current study, the effect of the teacher professionalism on learning outcomes remains unclear.

Empirical studies on teacher professional competence are still in their early stages (Nguyen et al., 2023). Teacher professional competence is also influenced by psychological factors such as beliefs, motivation, and self-regulation. Preparing professional documents based on the current syllabus/designs as required by the TPAD tool in the TSC PC

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requirements is only a small part of professional competency. The TPAD tool lacks sections to measure such factors. The key question about teacher professionalism is: to what extent does teacher professionalism as envisioned on the TSC TPAD tool translate into teacher competence (better teaching, better learning outcomes for students, and, ultimately, quality education?). Research studies reveal that pedagogical knowledge is an important component of teacher professional competence, but knowledge alone is insufficient to make teachers competent (Kraft & Christian, 2022). According to Nguyen et al. (2023), the major gaps in evaluating teacher professional competence are the lack of standardization in defining and measuring teacher competence and underemphasis on contextual and environmental factors affecting teaching and learning.

While the link between teacher professionalism and pupil learning outcomes is well-supported in the literature, several challenges, particularly in Kenyan primary schools, including the study area, are notable. There is a lack of adequate resources, and teachers face significant constraints that limit their ability to maintain high levels of professionalism. The demanding nature of the teaching profession, without adequate support or recognition, can lead to burnout, which negatively impacts pupil learning outcomes. In several cases, teachers have very large classes, with an enrolment of more than 60 learners per class. The effectiveness of teacher professionalism may also vary based on cultural norms, educational policies, and contextual factors such as socioeconomic status. The level of teacher professional knowledge and practice among teachers could vary individually and widely, and therefore teachers may require targeted support and training to improve specific aspects of their teaching. Additionally, although teacher knowledge and practice are crucial, student factors such as socio-economic status, motivation, and home support may also significantly impact learning outcomes.

III. METHODOLOGY

The study was carried out in Kakamega County in Western Kenya. Kakamega County has one TSC County Director, 13 Sub County Directors of Education, 27 Curriculum Support Officers, 899 public primary schools and 10,145 public primary school teachers employed by TSC according to Kakamega County TSC Unit in 2019**.** The study adopted a correlation research design with a mixed methods approach. This design and approach were preferred because the nature of the study required both quantitative and qualitative data sources to appropriately establish the associations between teacher target achievement and pupil learning outcomes. The sample size (82) was determined using the Cochran formula. The 899 public primary schools are distributed over a vast area of 3092Km^2. Table 3 shows the distribution of primary schools in the Sub counties of Kakamega County.

Table 3

Distribution of Public Primary Schools in Sub-counties of Kakamega County

S/NO	Sub County	Number of Public Primary Schools
1	Kakamega Central	64
2	Navakholo	61
3	Kakamega North	116
4	Matete	45
5	Butere	80
6	Khwisero	61
7	Kakamega East	100
8	Kakamega South	80
9	Lugari	56
10	Likuyani	66
11	Matungu	68
12	Mumias West	53
13	Mumias East	49
	Total	**899**

Source: *Kakamega County TSC Unit of 2023.*

Using multistage sampling, 82 schools were randomly selected from the thirteen Sub-counties of Kakamega County. Four Sub Counties (Kakamega North, Navakholo, Kakamega South and Mumias East) were first randomly selected; within the four sub counties, 82 public primary schools were selected by systematic random sampling (20 schools from each of the selected Sub-counties). The headteachers of the selected schools were then approached and interviewed on teacher achievement in the professional knowledge and practice PC target and the KCPE mean scores over the last six years (2018-2023). Pupil retention and completion rates were obtained from the county education office records. One teacher was also randomly selected from each of the selected schools and interviewed on the PC process. Additionally, four (4) key informants who included 2 Curriculum Support Officers (CSOs), 2 TSC Sub County Directors and the Kakamega County TSC Director were also selected purposefully for the

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study. The four selected Key informants are officers involved in the supervision and implementation of the teacher PC and carry out regular appraisals of teacher performance in schools.

Data was collected using questionnaires and Key informant interview guides. The data Collection tools were pretested in the neighbouring Lugari Sub County and the instruments attained a reliability coefficient of 0.782. Quantitative data collected was analysed using descriptive statistics, Pearson corelation and multiple linear regression analysis with the aid of the Statistical Package for Social Sciences (SPSS) computer software program Version 27. The qualitative data collected was analysed thematically using the N-Vivo version 14 computer software. The results of the study are presented in narratives, tables and figures. This research study was approved by the Department of Education, administration and Planning of Masinde Muliro University. The Kakamega County Director of Education also gave authority to conduct the study. The study also obtained a research permit from the National Commission of Science, Technology and Innovation (NACOSTI- License No: NACOSTI/P/23/28363).

IV. FINDINGS & DISCUSSION

4.1 Sociodemographic Characteristics of the Head Teachers

The sociodemographic characteristics of the head teachers are summarised in Table 4

Table 4

Sociodemographic Characteristics of Headteachers

	Variable	Frequency	Percentage
Type of school	Day	81	98.8%
	Boarding	1	1.2%
	Total	**82**	**100%**
Sex of Head teacher	Male	61	74.4%
	Female	21	25.6%
	Total	**82**	**100%**
Age category	30-40 years	8	9.8%
	41-50 years	41	50.0%
	Above 50 years	33	40.2%
	Total	**82**	**100%**
Experience as Head teacher	1-5 years	21	25.6%
	6-10 years	34	41.5%
	11-15 years	21	25.6%
	Above 16 years	6	7.3%
	Total	**82**	**100%**
Category of school	Mixed	81	98.8
	Girls	1	1.2
	Total	**82**	**100%**
Period which school has done KCPE examination	5-9years	1	1.2%
	10-14 years	17	20.7%
	15-20 years	63	57.7%
	Above 20 years	1	1.2%
	Total	**82**	**100%**
Understaffing level	3-5 Teachers	54	65.9%
	More than 5 teachers	28	34.1%
	Total	**82**	**100%**

It was observed from Table 4 that almost all (81) 98.8% of the public primary schools in the study were day schools**.** Most (61)74.4% of the head teachers were male. The age of the head teachers ranged from 36 years to 59 years with a mean of 47.84 years and a standard deviation of ±5.821. A majority (61) 74.3% of the head teachers had more than five years' experience as head teachers. A majority (81) 98.8% of the public schools sampled were mixed primary schools (the learners were both boys and girls) with a majority (81) 98.8% of the schools having done KCPE examinations for a period of over 10 years.

The total number of TSC teaching staff per school ranged from 14 to 27 with a mean of 18 teachers per school. The number of male teaching staff in the schools ranged from 6 to 16 with a mean of 10 teachers. The number of female teaching staff in the schools ranged from 5 to 13 with a mean of 8 female teachers. Most (54) 65.9% of the schools were understaffed, lacking up to 5 teachers as per the Curriculum Based Establishment (CBE).

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4.2 Sociodemographic Factors of Teachers

The sociodemographic characteristics of the teachers are summarised in Table 5

Table 5

Sociodemographic Characteristics of Teachers

Variable	Variable	Frequency	Percentage
Type of school	Day	81	98.8%
	Boarding	1	1.2%
	Total	**82**	**100%**
Sex of the teacher	Male	50	61%
	Female	32	39%
	Total	**82**	**100%**
Age category	30-40 Years	8	9.8%
	41-50years	41	50.0%
	Above 50 years	33	40.2%
	Total	**82**	**100%**
Experience as a teacher	1-5 years	6	7.3%
	6-10 years	19	23.2%
	11-15 years	9	10.9%
	Above 16 years	48	58.5%
	Total	**82**	**100%**

It was observed from Table 5 that most (50) 61% of the teachers were male. The age of the teachers ranged from 28 years to 56 years with a mean of 42.65 years and a standard deviation of ±8.298. The teachers experience ranged from 4 years to 32 years with a mean of 16 years. More than half (48) 58.5% of the teachers had more than 16 years of experience in the teaching service.

4.3 Sociodemographic Characteristics of the Key Informants

Four Key informants participated in the study. They included the Kakamega County TSC director, One Sub-County TSC Director and two Curriculum Support Officers (CSOs). The age range of the Key informants ranged from 41years to 54 years. All the Key informants had over 6 years' experience in their duties of teacher management. They were selected for the study because of their knowledge and experience on the requirements of teachers PC and also because they are involved in regular teacher PC appraisals. Data from the Key informants has been triangulated with quantitative data from the headteachers and teachers to arrive at the findings of this study.

4.3.1 Mean Scores of Professional Knowledge and Practice Target and Learning Outcomes (2018-2023)

The mean scores of annual achievements in teacher professional knowledge and practice target, the learning outcomes of pupil academic achievement, pupil completion rates and pupil retention rates over the six-year period (2018-2023) were first computed. The results are summarised in the Table 6.

Table 6

Teacher Professional Knowledge and Practice Target Achievement and the Learning Outcomes (2018-2023)

Variables	Teachers Achievement	Pupil Learning Outcome Mean scores		
Year	**Professional Knowledge and Practice Targets Annual Mean Scores**	**KCPE Scores**	**Retention Rates**	**Completion Rates**
2018	**74.49**	263.87	75.20	82.60
2019	**73.24**	272.62	81.40	84.50
2020	**75.90**	275.58	83.60	81.40
2021	**72.78**	281.09	81.40	84.60
2022	**75.38**	283.83	83.30	83.20
2023	**75.00**	288.70	82.70	84.10

4.3.2 Analysis and Categorisation of the Achieved Professional Knowledge and Practice PC Target Scores.

The scores attained by teachers in the Professional Knowledge and Practice PC target were first analysed using descriptive statistics. The results are presented in Table 7.

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Table 7

Analysis of Professional Knowledge and Practice PC Target Scores

N	82
Mean	74.476
Std. Error of Mean	.1618
Std. Deviation	1.4650
Range	8.5
Minimum	69.8
Maximum	78.3

Using the mean (74.476) and the Standard deviation (±1.4650), attained in table 6, a cut-off was set at 75%. Scores above 75% were categorised as good. The results are summarised in Table 8

Table 8

Categories of Achieved Professional Knowledge and Practice Target Scores

Categories	**Frequency**	**Percentage**
Poor	50	61.0
Good	32	39.0
Total	**82**	**100.0**

It was observed from Table 8 that only 39% of the scores were in the category of good scores

4.3.3 Teacher Professional Knowledge and Practice PC Target Achievement Effect on Academic Achievement

The study sought to establish the association between teachers' Professional knowledge and practice target achievement and the learning outcome of academic achievement using Pearson Correlation. The result is summarised in Table 9.

Table 9

Association between Teachers' Professional Knowledge and Practice Target Achievement and KCPE Performance (2018-2023)

Variable	**Professional Knowledge and practice Target**	**KCPE Performance**
Pearson Correlation	1	.159
Sig. (2-tailed)	-	.764
N	6	6

From table 9, it is observed that the Pearson correlation coefficient is r= 0.159. This indicates a very weak positive correlation between teacher professional knowledge/practice target achievement and pupil KCPE performance. the p-value is 0.764, which is much higher than 0.05. This suggests that there is no statistically significant association between professional knowledge/practice target achievement and KCPE performance.

Regression analysis was conducted to determine whether achievement in the Professional Knowledge and Practice PC target significantly influenced KCPE performance (Table 10). The analysis revealed a very weak, statistically insignificant relationship ($\beta = 0.159$, $p = 0.764$). These results suggest that teachers' achievement in the professional knowledge and practice target did not significantly predict learners' KCPE performance. This aligns with qualitative feedback indicating that the current appraisal approach might not adequately capture practices that directly impact learner achievement. Only 2.5% of the variance in KCPE performance can be explained by variations in Professional Knowledge and Practice scores ($R^2= 0.025$). This is extremely low and suggests a poor fit of the model. Adjusted R^2 (-0.208) implies that the model does not improve prediction beyond the mean. Therefore, the regression model is not statistically significant, and professional knowledge and practice scores do not meaningfully predict KCPE performance among the sample schools.

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Table 10
Summary of the Regression Model

Statistic	Value
R	.159
R-squared	.025
Adjusted R-squared	-0.208
Standard Error Estimate	—
Sig. (p-value)	.764

4.3.4 Professional Knowledge and Practice Target Achievement Effect on Retention Rates

The study sought to establish the association between teachers' professional knowledge and practice target achievement and the learning outcome of retention rates using bivariate Correlation. The result is summarised in Table 11.

Table 11
Association between Teachers' Professional Knowledge and Practice Target Achievement and Pupil Retention Rates (2018-2023)

	Professional Knowledge and practice Target	Pupil retention rates
Pearson Correlation	1	.285
Sig. (2-tailed)	-	.585
N	6	6

From table 11, Pearson correlation coefficient was 0.285 suggesting a weak positive correlation; however, the high p-value of 0.585 indicates non-significance. This implies that no meaningful association exists between the two variables. Regression was conducted to examine whether teachers' achievement in the Professional Knowledge and Practice (PKP) target significantly predicts pupil retention rates (Table 12). The regression model was not statistically significant, F (1,4) = 0.597, p = .585, and explained only 8.1% of the variance in retention rates (R^2 = .081; Adjusted R^2 = -0.138). The coefficient for PKP score was not significant (β = .285, p = .585), indicating that variations in PKP scores do not meaningfully predict changes in pupil retention. These results suggest that other factors may have stronger influence on pupil retention outcomes than PKP target achievement alone.

Table 12
Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.285	0.081	-0.138	3.69

4.3.5 Professional Knowledge and Practice Target Achievement Effect on Completion Rates

The study sought to establish the association between teachers' Professional knowledge and practice target achievement and the learning outcome of pupil completion rates using bivariate analysis. The result is summarised in Table 13.

Table 13
Association between Teachers' Professional Knowledge and Practice Target Achievement and Pupil Completion Rates (2018-2023)

	Professional Knowledge and practice Target	Pupil completion rates
Pearson Correlation	1	-.079
Sig. (2-tailed)	-	.061
N	6	6

From table 13, it was observed a Pearson correlation coefficient of -0.079 suggesting a weak negative correlation; however, the high p-value of 0.061 indicates non-significance. This implies that no meaningful association exists between the two variables. Regression analysis was conducted to evaluate whether teachers' achievement in the Professional Knowledge and Practice (PKP) performance contract target significantly predicts pupil school completion rates. The results (Table 14) indicated a very weak, negative, and statistically non-significant relationship between the variables (R = -0.079, R^2 = 0.006, p = .719). The model explained only 0.6% of the variance in completion rates and did not significantly improve predictive capability over the mean. These results suggest that teacher achievement in PKP

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targets has no meaningful influence on pupil completion rates, pointing to the likelihood that other factors may play a more substantial role in determining completion outcomes.

Table 14

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	-0.079	.006	-0.243	2.41

4.3.6 Enhancement of Performance Contracting Target Achievement

The study sought to establish PC implementation shortcomings from the head teachers and teachers and how PC target achievement could be enhanced to improve on learning outcomes. The results are presented in Tables 15 and 16

Table 15

Headteachers Opinions on Enhancement of Performance Contracting Target Achievement (N=82)

Teacher Performance Contracting target achievement can be enhanced by:	Level of agreement				
	Strongly Disagree	Disagree.	Not sure	Agree	Strongly Agree
1.Timely feedback	-	1 **(1.2%)**	2 **(2.4%)**	30 **(36.6%)**	49 **(59.8%)**
2.Training Workshops	-	10 **(12.2%)**	-	31 **(37.8%)**	41 **(50%)**
3.Involving the support staff	26 **(31.7%)**	31 **(37.8%)**	5 **(6.1%)**	11 **(13.4%)**	9 **(11%)**
Regular teacher professional growth	3 **(3.7%)**	40 **(48.8%)**	2 **(2.4%)**	19 **(23.2%)**	18 **(22%)**
Regular Teacher PC assessment	6 **(7.3%)**	1 **(1.2%)**	-	29 **(35.4%)**	46 **(56.1%)**

From table 15, it was observed that the head teachers agreed with most of the opinions to enhance teacher Performance Contracting target achievement with greater than 80% agreeing on strategies of timely feedback, training workshops and regular teacher PC assessment. However, more than two thirds of the Headteachers 63 (69.5%) disagreed with the suggestion of involving support staff

Table 16

Teachers Opinions on Enhancement of Performance Contracting Target Achievement (N=82)

Teacher Performance Contracting target achievement can be enhanced by:	Level of Agreement				
	Strongly Disagree	Disagree.	Not Sure	Agree	Strongly Agree
1.Timely feedback	3 **(3.7%)**	9 **(11%)**	3 **(3.7%)**	18 **(22%)**	49 **(59.8%)**
2.Training Workshops	5 **(6.1%)**	12 **(14.6%)**	3 **(3.7%)**	20 **(24.4%)**	42 **(51.2%)**
3.Involving the support staff	44 **(53.7%)**	20 **(24.4%)**	6 **(7.3%)**	7 **(8.5%)**	5 **(6.1%)**
Regular teacher professional growth	-	11 **(13.4%)**	4 **(4.9%)**	34 **(41.5%)**	33 **(40.2%)**
Regular Teacher PC assessment	44 **(53.7%)**	18 **(19.5%)**	3 **(3.7%)**	10 **(12.3%)**	9 **(11%)**

From table 16, it was observed that the teachers agreed with most of the proposed strategies to enhance teacher Performance Contracting target achievement with greater than 80% agreeing on strategies for timely feedback, training workshops and regular teacher PC assessment just like the head teachers. The teachers also disagreed involving support staff 64 (78.1%). Unlike the head teachers, most teachers 62 (73.2%) disagreed on the strategy of regular teacher PC assessment. The PC process appeared unpopular. As one of the teachers put it:

> *'PC assessment takes a lot of time. It involves a lot of paperwork and filling. If we have regular PC assessment, where will we get the time to complete the syllabus, and revise for national examinations?'* (Female teacher in one of the Selected schools, 2023)

The CSOs, the Sub-County Director of TSC and the County Director of TSC also confirmed that most teachers did not like PC appraisals. The teachers had developed a negative attitude towards the PC programme. The County Director of TSC had this to say:

> *Teachers have looked at the whole PC process as a mere routine procedure. It is only recently that teachers started taking PC as serious when the Teachers Service Commission started using the PC scores in promotion interviews. But even then, most teachers appearing for interviews could not recall what was being assessed on the TPAD tool* (Kakamega County TSC Director, 2023)

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4.3.7 Variation in Teachers' Performance Contracting Target Achievement and Pupils' Learning Outcomes

Other than the Teachers attitude towards the PC process, the study went further to establish from the head teachers the cause of variation in teachers' performance contracting target achievement and pupils' learning outcomes. The results are presented in Tables 17.

Table 17

Headteachers Opinions on Cause of Variation in Teachers' Performance Contracting Target Achievement and pupils' Learning Outcomes (N=82)

Variation in teacher target achievement in PC and pupil learning Outcomes is due to:	**Level of Agreement**				
	Strongly Disagree	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
Poor supervision of the PC process	27 (32.9%)	51 (62.2%)	1 (1.2%)	2 (2.4%)	1 (1.2%)
Poor understanding of the PC process by teachers	32 (39%)	49 (59%)	-	1 (1.2%)	-
Limited ICT knowledge by teachers	22 (26.8%)	51 (62.2%)	1 (1.2%)	8 (9.8%)	-
Negative attitude towards the PC process	2 (2.4%)	3 (3.7%)		47 (57.3%)	30 (36.6%)
Failure by teachers to attach value to the PC benefits	-	3 (3.7%)	-	44 (53.7%)	35 (42.7%)

4.4 Discussion

The results of this study show that there exist very weak associations between teacher's professional knowledge and practice target achievement and the learning outcomes of KCPE performance (r=.159; P= 0.7640), retention rates (r= 0.285; p=0.585) and completion rates (r=-0.079; p=0.061). The high p-values indicate that the associations are not significant. The Regression models also revealed a very weak, statistically insignificant relationships between teacher's professional knowledge and practice target achievement with the learning outcomes. This therefore means that there isn't enough evidence to support the associations as meaningful. We therefore fail to reject the null hypothesis that there is no significant association between target achievement and learning outcomes among pupils in public primary schools in Kakamega County in Kenya. The findings also mean that teacher achievement in Professional knowledge and practice PC target did not meaningfully predict KCPE performance among the sample schools.

The qualitative insights of the study also supported these findings. All the Key informants were of the opinion pupil learning outcomes witnessed in the study were mainly due to poor teachers' attitudes towards the PC process. Teachers felt that the whole PC process takes a lot of time and was meaningless. Such sentiments point at poor teacher attitudes and could perhaps be the reason why only a few teachers (39%) scored well in the Professional knowledge and practice PC target. This is corroborated with the Headteachers view (>90%) that many teachers did not attach value to the PC process (Table 10). The common problem where teachers feel that the same questions are being asked during the appraisal process could be easily handled through stimulus variation. This finding could imply that the teachers still have some form of resistance towards the whole PC process. Teachers countrywide had initially resisted the PC process.

These study findings corroborate with study findings by Chirchir and Letangule (2021) of implementation of PC in secondary schools in Nyeri and in Kisii Counties in Kenya.) Chirchir and Letangule reported in that most schools in Nyeri County in Kenya, teachers' scores in the appraisals did not correlate with the learners' secondary school Kenya Certificate of Secondary Education (KCSE) examination performance. This study had also examined dependability of student learning outcomes on performance appraisal for teachers in public secondary schools in Kisii County. Chirchir and Letangule's study of schools in Kisii County looked at appraisal variants of teacher qualifications, professional development, appraisal ratings, and student survey ratings with student learning achievement. The study established that appraisal using TPAD minimally contributed to student academic achievement in public secondary schools in Kisii County, Kenya. Chirchir and Letangule (2021) studies seem to cast doubt on the appraisal scores relation to the learning outcome of academic achievement. However, an earlier study by Aloo *et al*. (2017), using a correlation study design in Public Secondary schools in Kisii County (Kenya) found that PC had a significant positive effect on timeliness in curriculum implementation (r=.604; p< .05). However, Aloo's study did not examine how PC targets influenced learning outcomes. The results of these studies are conflicting and failed to look at whether the set PC targets were achieved, and the effects of target achievement on other learning outcomes.

Unlike the findings of the current study, several studies have reported a positive relationship between teacher professionalism and learning outcomes (Perry *et al*. 2021; Beach *et al*. 2021). The argument in these studies is that teacher professionalism and practice influences teachers' performance in the classroom by providing teachers with new information, techniques, tools, and instructional strategies that they can use to connect with and engage their students. However, these studies also assert that the Knowledge and instructions need to be relevant to the expected learning

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outcomes. A study Kutaka *et al* (2017) concluded that while professional knowledge can lead to improved learning outcomes, the effectiveness often depends on the relevance and application of the training received by teachers.

The findings of the current study have implications on the appraisal in the PC policy for teachers. The findings of could imply that either, the teachers, and more so the headteachers are scoring target achievement poorly, or the scoresheets used are faulty, or the aspects being evaluated on the TPAD tool have little bearing with the learning outcomes being studied. This argument corroborates with the Teachers Service Commission observation report of 2016, in the newsletter, where it had been observed that the average score of 80% achieved in most targets by teachers should arguably translate to good National examination performance (TSC, 2017). However, in many schools with high PC target scores, the performance in Kenya Certificate of Secondary Education (KCSE) national examinations was still poor (TSC,2017). Looking at results of the current study, and by admission of the Curriculum Support Officers, the Sub-County TSC Directors and the County TSC Director, most teachers still teachers have negative attitude towards the PC process. The appraisal process is supervised by these officers who most likely carry out the appraisal process professionally. Therefore, it is most likely that the aspects captured on the PC scoresheets may have little bearing on the learning outcomes being studied. One of the main shortcomings mentioned by the Key informants was that the TPAD tool could not evaluate all aspects of learning outcomes such as learner creativity, communication scales and problem-solving skills.

Some scholars have argued that PC in the teaching service is a meaningless exercise (Camilleri, 2021; Singh & Loh, 2024; Darling Hammond *et al*., 2020; Jensen, 2011; Hallinger *et al*., 2014). In one earlier study carried out on the effects of PC on effectiveness of curriculum implementation in Australia, Jensen (2011) had reported that teachers were delayed in fundamental areas of curriculum implementation by the large amount of record filling. Jensen's study also found that student performance in reading had dropped significantly and performance in mathematics had also stagnated. A Kenyan study by Mbua and Sarisar (2013), had concluded that teacher PC still has some gaps in its implementation. The gaps identified by Mbua and Sarisar (2013) included a lack of feedback for teachers, a lack of participation by support staff in the PC implementation process, and ineffective appraisal criteria. According to Hollweck and Lofthouse (2021)., from a broad perspective, performance appraisals are designed to help organizations draw the best out of their employees, by enabling individual employees to perform at optimal levels. However, the execution of such systems is not always easy and the appraisals frequently do not achieve their goals, with the result that both the employees and their supervisors are often dissatisfied with the system.

Although positive associations between teacher professionalism and learning outcomes are well-documented elsewhere in research (Desimone *et al.*, 2009; García et al., 2023; Harris & Jones, 2021), the quality of learning outcomes vary due to challenges experienced by teachers, especially in the educational systems in developing countries including Kenya. Many educational systems suffer from insufficient resources, and teachers encounter significant limitations that hinder their capacity to uphold high professional standards. The pressures on the teaching profession to produce good mean scores in national examinations including KCPE, compounded by a lack of support or acknowledgment, can result in burnout, which adversely affects learning outcomes. In many instances in the study area, teachers are tasked with managing very large class populations, often with enrolments exceeding 60 pupils per class. Thus, while the professionalism of teachers can influence student learning outcomes, it is important to consider issues like insufficient resources, teacher burnout and pedagogy to guarantee that every student receives the advantages of teacher professionalism to have good learning outcomes.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

In the context of the current study, teacher achievement in the professional knowledge and practice PC target has no effect on pupil learning outcomes.

5.2 Recommendations

The study recommends that as TSC implements ongoing professional development programs, focus should be on pedagogical strategies with stimulus variation rather than just content knowledge. This would equip teachers with effective teaching methods that could positively impact student learning outcomes. There is need for further research to establish the relationship between specific aspects of teachers' professional knowledge (e.g., subject-specific pedagogy) and student outcomes rather than relying solely on overall scores. There is need for further research to establish the influence of teachers' professional knowledge (e.g., subject-specific pedagogy) with other pupil learning outcomes such as creativity, problem solving skills and communication skills.

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REFERENCES

Aloo, J. O., Ajowi, J. O., & Aloka, P. J. O. (2017). Influence of teachers' performance appraisal policy on timeliness in implementation of the curriculum in public secondary schools in Kenya. *Journal of Educational and Social Research*, 7(3), 34–37.

Beach, P., Favret, E., & Minuk, A. (2021). Online teacher professional development in Canada: A review of the research. *Canadian Journal of Learning and Technology*, 47(2), n2.

Camilleri, M. A. (2021). Evaluating service quality and performance of higher education institutions: A systematic review and a post-COVID-19 outlook. *International Journal of Quality and Service Sciences*, 13(2), 268–281.

Chirchir, K. M., & Letangule, S. (2021). The influence of teacher performance appraisal and development implementation on the secondary students' examination scores in public schools in Kenya. *European Journal of Education and Pedagogy*, 2(6), 34–44.

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140.

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward better conceptualizations and measures. *Educational Researcher*, 38(3), 181–199.

García, E., Wei, W., Patrick, S. K., Leung-Gagné, M., & DiNapoli, M. A., Jr. (2023). In debt: Student loan burdens among teachers. *Learning Policy Institute*.

GOK. (2012). *Kenya: Facts and figures 2012*. Nairobi: Kenya National Bureau of Statistics.

Hallinger, P., Heck, R. H., & Murphy, J. (2014). Teacher evaluation and school improvement: An analysis of the evidence. *Educational Assessment, Evaluation and Accountability*, 26(1), 5–28.

Harris, A., & Jones, M. S. (2025). Professional learning at scale—Navigating complexities and sustaining collaboration. *Scottish Educational Review*, 55(1–2), 128–146.

Hollweck, T., & Lofthouse, R. M. (2021). Contextual coaching: Levering and leading school improvement through collaborative professionalism. *International Journal of Mentoring and Coaching in Education*, 10(4), 399–417.

Hood, C. (2012). Public management by numbers as a performance-enhancing drug: Two hypotheses. *Public Administration Review*, 72(S1), S85–S92.

Jensen, B. (2011). *Better teacher appraisal and feedback: Improving performance*. Grattan Institute.

Kraft, M. A., & Christian, A. (2022). Can teacher evaluation systems produce high-quality feedback? An administrator training field experiment. *American Educational Research Journal*, 59(3), 500–537.

Kutaka, T. S., Smith, W. M., Albano, A. D., Edwards, C. P., Ren, L., Beattie, H. L., ... & Stroup, W. W. (2017). Connecting teacher professional development and student mathematics achievement: A 4-year study of an elementary mathematics specialist program. *Journal of Teacher Education*, 68(2), 140–154.

Mbua, P., & Sarisar, J. O. (2013). Challenges in the implementation of performance contracting initiative in Kenya. *Public Policy and Administration Research*, 3(2), 44–61.

Morara, G. N. (2018). Influence of teacher performance on learning achievement in public secondary schools in Kisii County, Kenya. *International Journal of Education*, 10(2), 21–31.

Mutahaba, G. (2011). Report on the adoption and use of performance management systems including measurement, monitoring and evaluation in Africa. University of Dar es Salaam.

Nguyen, T. T. H., Darsono, S. N. A. C., Phan, G. Q., Pham, T. H. V., Bach Thi, H., & Johari, S. M. (2023). The nexus between corporate performance and state ownership in Vietnam: Evidence of state ownership's inverted U-shape and provincial business environment influences. *Journal of Risk and Financial Management*, 16(12), 499.

Omondi, J. D. (2015). A study on effects of performance contracting implementation on service delivery at Kenya Ports Authority. *Public Policy and Administration Research*, 4(6), 34–45.

Perry, T., Findon, M., & Cordingley, P. (2021). Remote and blended teacher education: A rapid review. *Education Sciences*, 11(8), 453.

Popova, A., Evans, D. K., Breeding, M. E., & Arancibia, V. (2022). Teacher professional development around the world: The gap between evidence and practice. *The World Bank Research Observer*, 37(1), 107–136.

Singh, N., & Loh, S. C. (2024). Role of professional learning communities in improving teachers' job satisfaction: Why does trust in colleagues and emotional intelligence matter? *International Journal of Leadership in Education*, 1–24.

Skaalvik, E. M., & Skaalvik, S. (2020). Teacher burnout: Relations between dimensions of burnout, perceived school context, job satisfaction and motivation for teaching. A longitudinal study. *Teachers and Teaching*, 26(7–8), 602–616.

Teachers Service Commission - TSC Unit, Kakamega County. (2019). KCPE performance in Kakamega primary schools.

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Teachers Service Commission - TSC Unit, Kakamega County. (2019). The distribution of schools in Kakamega sub-counties.

Teachers Service Commission (TSC). (2017). A report on the implementation of the PC/TPAD, by CSOs & CDs KTIC/TPAD/V.1/6(62).

Teachers Service Commission (TSC). (2017). Strengthening of PC & TPAD at institutional level (Circular No. 14/ADM/192A/Vol.IX).

Teachers Service Commission (TSC). (2018). The era of transformative change: Teacher appraisals and PCs the new reform drivers (K. Kamotho, Ed.). *Teachers' Image*, (21), 66.

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Association between blood group, CD4, Viral load and opportunistic infections among patients attending Kericho county referral comprehensive care clinic, Kenya

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ABSTRACT

Erythrocyte antigens bringing about blood groups are considered pathogen receptor sites, including Human Immunodeficiency Virus (HIV), affecting approximately 39.9 million people worldwide, with 3.31% and 3.3% prevalence in Kenya and Kericho County, respectively. Limited studies showing inconsistent results and unpublished perceptions suggest a possible role of blood groups in Human Immunodeficiency Virus disease surveilled by changes in CD4 counts, viral load and opportunistic infections among infected. This study determined the ABO-Rhesus blood group distribution and association with CD4 counts, viral load and opportunistic infections at the Kericho County Referral Hospital Comprehensive Care Clinic in the year 2020. This cross-sectional, retrospective study comprised randomly sampled adults (≥18 years) without bone marrow transplant or transfusion history, with the sample size (n=285) calculated using the Yamane Taro formula. ABO-Rhesus typing was done on venous ethylenediaminetetraacetic acid blood using commercial antisera. Viral load and CD4 counts, determined using Abbott m2000sp/rt and FacsCalibur, respectively, and opportunistic infection data were documented in the data extraction form. Statistical Package for Social Sciences SPSS® version 26 was used to analyse and summarise data as means, standard deviation and prevalence ratios. Z-test, analysis of variance, regression, and chi-square were used to contrast, compare means, assess outcomes among variables, and determine relationships, respectively. Ethical principles were observed during specimens' and participants' information handling. Females were the majority, 174 (61.1%), and the mean age was 42.8 (12.8) years. Blood group O was most prevalent at 138 (48.4%), followed by A at 78 (27.4%), B at 59 (20.7%), and the least was AB. The Analysis of Variance showed a statistically non-significant association between blood groups on both viral load (p=0.74) and CD4 counts (p=0.84). Predictors for viral load change on regression analysis found increased viral load improvement in blood group AB-positive compared to blood group A-positive (OR=6.77, 95% CI [1.82-14.33], p=0.01). Most of the participants did not develop opportunistic infections, n=209 (73.3%). Tuberculosis was more prevalent among blood groups on chi-square: A-positive (16.2%), B-positive (16.4%), O-positive (17.7%), O-negative (12.5%) and B-negative. Blood groups A-negative and AB-negative developed no opportunistic infections. The differences were, however, not significant at the 95% level of significance (p=0.91). The study showed a non-significant association between the ABO blood groups and HIV infection based on CD4 counts, viral load and opportunistic infections. However, group AB-positive and those with good adherence were associated with viral load improvement. Increased CD4 count and body mass index were associated with reduced opportunistic infections. Viral load increase was associated with likelihood of opportunistic infection. Further studies need to be conducted for comparison.

Keywords: ABO-Rhesus Blood Groups, CD4 Count, HIV Infection, Opportunistic Infections, Viral Load

I. INTRODUCTION

Antigens of blood group are found in the surface of red blood cells (RBCs) and they consist of polysaccharides and proteins. The antigenic factors present on the surface of the RBCs determine ABO/Rhesus blood group systems. The presence of antibodies is common to the serum of a person who does not have the antigens in question, which is also the key principle of the ABO and the Rhesus blood group systems (Lendabo et al., 2024). ABO system is identified by three alleles (A, B and O) whereas Rhesus system is regulated by the RHD gene, and the status of Rhesus is

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determined by the presence or absence of the antigen RhD. Blood group distribution varies with population, and the differences are believed to be the influence of evolutionary pressures especially the ones associated with resistance to diseases (Dean, 2005). These variations in frequencies have resulted in different prevalence rates in different regions (Anstee, 2010). In the previous years, scholars have investigated the interplay between ABO and Rhesus blood groups and disease outcomes (Liumbruno & Franchini, 2013). Some phenotypes seem to increase susceptibility to some conditions like malaria and anemia, which is an indication that blood group antigens have a role in determining disease susceptibility. An example is a Scottish outbreak in 1996, which disclosed that Escherichia coli O157 affected people with blood type O disproportionately, and the fatality rate was 87.5% (Blackwell et al., 2002). More recently, Yeda et al. (2022) were able to conclude that B-positive individuals had a higher probability of having high Plasmodium falciparum parasitemia as compared to their O-positive counterparts. There is also a genetic factor: CCR5 32 mutation, which provides resistance to Human Immunodeficiency Virus type 1(HIV-1) was historically associated with resistance to smallpox and the Black Death, what explains how infectious disease has influenced the allele frequency over time (Duncan et al., 2005).

Such associations are further brought out in malaria studies. Opi et al. (2023) provided evidence that people with non-O genotypes are particularly vulnerable to severe malaria, whereas Wolofsky et al. (2012) found blood group A as an indicator of more severe P. falciparum infections. Interestingly, Jeremiah et al. (2010) discovered that blood group O as well as RhD-negative were both positively related to the severity of malaria. Other than malaria, the blood group phenotype has been linked with a multiplicity of conditions: ulcers (Edgren et al., 2010), Chagas disease (Teixeira et al., 1987), dengue fever (Kalayanarooj et al., 2007), and even type 2 diabetes, with blood group B found guilty (Sharjeel et al., 2021). The effects of the blood groups spread even into the non-infectious diseases. The non-O types of blood, such as those, have been associated with an almost three-fold higher cardiovascular risk than the type O (Capuzzo et al., 2016). Non-O blood types put individuals who have familial hypercholesterolemia at a twofold risk of cardiovascular events (Paquette et al., 2018). These conclusions indicate the health consequences of ABO systems on a wider scale.

Mechanistically, the antigens themselves may explain these associations. ABO antigens are complex carbohydrate molecules on red blood cells, and their presence or absence can either facilitate or hinder pathogen binding (Kato & Ishiwa, 2015). Secreted A and B antigens may act as decoys, offering some protection, whereas non-secretors who lack soluble antigens may be more vulnerable due to exposed polysaccharides that enhance pathogen attachment (Naeini et al., 2010; Dotz & Wuhrer, 2016). The Rhesus system also plays a critical role in immune responses, most notably in hemolytic disease of the newborn, where Rh-negative mothers develop antibodies against Rh-positive fetal cells, endangering subsequent pregnancies (Anstee, 2010). Given this background, it is reasonable to consider whether blood group antigens influence the course of HIV infection. Since its first identification in 1981 in the United States (Landers et al., 2021), HIV has remained a global health crisis. United Nations programme on HIV/AIDS (UNAIDS) estimates that nearly 40 million people are currently living with HIV, and more than 42 million have died since the epidemic began (Manalu et al., 2025). In 2023 alone, approximately 630,000 HIV-related deaths were reported, with Sub-Saharan Africa accounting for almost 70% new infections (World Health Organization, 2024).

Kenya reflects these global patterns, approximately 1.6 million people are living with HIV, with women disproportionately affected with more cases compared to men. National prevalence remains higher among women (5.2%) than men (4.5%) (Ministry of Health, 2018). In Kericho County, where this study was conducted, the disparity is even more pronounced: prevalence among women (19.1%) is nearly double that of men (11.3%) (Foglia et al., 2008). HIV remains a chronic, life-threatening condition, transmitted primarily through the exchange of infected body fluids.

Interestingly, Rhesus D-positive individuals have been shown to have a weak association with HIV susceptibility in Sub-Saharan Africa (Jacobs et al., 2023). This study aimed to investigate the role of ABO and Rhesus blood groups in HIV progression, focusing on their impact on cluster of differentiation 4 (CD4) counts, viral load, and the occurrence of opportunistic infections in individuals attending the Kericho County Referral Hospital Comprehensive Care Clinic.

1.1 Statement of the Problem

The antigens of the red blood cells lead to the attachment of the viral particles of HIV and subsequent transfer of the viral complexes into the immune cells thereby inducing the infection (Neil et al., 2005). This is believed to cause disparity in HIV infection vulnerability due to the variation of antigen expression among blood groups. Such differences can affect blood group distribution and prevalence across populations. Although there is some evidence suggesting association with immunity and susceptibility, the contribution of ABO-Rhesus blood groups to HIV disease is not well researched and is controversial. Blood group O was found to play some role in preventing blood borne infection compared to Blood Group A individuals who were found to be susceptible to Hepatitis B and HIV infection by Batool et al., (2017). A different study by Noori et al., (2022) revealed that AB carriers were more prone to HIV infection. Within the framework of blood groups in HIV, there is limited literature that can be referred to (Motswaledi et al., 2013)

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and no study of such has been conducted in Kericho County. The key issues that this study tries to put across are the differential susceptibility and protectiveness of blood groups, as demonstrated in some studies, and through the sense that is not published. Particularly, there is limited research on the reconstitution of HIV biomarkers including CD4+ T-cell counts and viral load in dissimilar ABO-Rhesus blood groups. This study also addressed the need for understanding on the role of blood groups in occurrence of opportunistic infections following immune system damage in HIV infection.

1.2 Research Objective

i. To examine the distribution of ABO and Rhesus blood groups among HIV-positive individuals attending the Kericho County Referral Comprehensive Care Clinic
ii. To assess their association with key HIV disease markers, including CD4+ T-cell counts, viral load, and the prevalence of opportunistic infections.

II. LITERATURE REVIEW

2.1 Theoretical Review

Erythrocyte surface antigens particularly those governing blood group system are known to act as receptors for various etiologic agents. The following theories support the possible association of blood groups with CD4 counts viral load and opportunistic infections.

2.1.1 Host Susceptibility and genetic determinants theory

Blood groups are genetically determined traits with known polymorphic expression among individuals and populations. Carbohydrate moieties of the ABO blood antigens facilitate adhesion and entry of pathogens into the host cells. The blood group antigens are therefore, receptors for toxins, parasites, and bacteria, and can facilitate colonization or invasion or evade host clearance mechanisms. Blood groups can also serve as false receptors, preventing binding to target tissue (Cooling, 2015). Alternatively, certain pathogens may not bind onto the red blood cells due to absence of blood group antigen carrier, causing the individual to be less vulnerable to that infection.

2.1.2 Immunological theory of HIV pathogenesis

The red blood cell antigen has been shown to bind free viral particles and viral immune complexes and facilitate transmission to the T cells. Blood group antigens allow pathogenesis by viral binding thereby either providing protection or increasing risk of infection. HIV targets and eventually deplete CD4+T cells leading to immune function decline and progression to Acquired Immune Deficiency Syndrome (AIDS)

2.2 Empirical Review

2.2.1 ABO and Rhesus blood groups among HIV infected patients

The ABO and Rhesus blood group have been linked to disease susceptibility including viral diseases (Cooling, 2015). Neil et al. (2005) showed that HIV-1 infected cells have ABO blood group antigens on their cell surface that allow integration into the viral envelop during budding and viral replication. Additionally, the naturally occurring antibodies in human sera do neutralize corresponding ABO antigens carried by the HIV virus by complement activation. In a study by Purna et al. (2024) it appeared that blood group B individuals were more prone to HIV infection with blood group AB being least affected. HIV is classified as the genus Lentivirus in the family of Retroviridae, subfamily Orthoretrovirinae. HIV pandemic affects approximately 39.9 million people worldwide with a prevalence of approximately 3.31% and 3.3% in Kenya and Kericho County respectively. The female and male prevalence in Kenya is 4.46 % and 2.16 % respectively (National Syndemic Disease Control Council (NSDCC), 2024) Kericho County ranks 18 nationwide in the HIV epidemic, with approximately 26,639 individuals living with the virus as per the NSDCC, 2024.The Kericho County percent prevalence in female population is similar to the nationwide prevalence and leads at 4.3% while the male prevalence is 2.3% which also upholds the national prevalence for males in a close proportion.

The HIV virus enters the cell by the surface assimilation of glycoproteins on its surface and fusion facilitated by the cellular receptors. This is followed by combination of the viral envelope with the cell membrane of the target cell and the let out of the HIV capsid into the cell. This process is then followed by; replication, transcription and recombination of the viral proteins before release of virions to infect other cells. There are two types of HIV; HIV-1 and HIV-2 and both have the same mode of transmission. HIV transmission occurs through contact with infected body fluids or tissues. HIV virus causes immune system damage (Raska & Novak, 2010). Literature has few articles describing associations between HIV infection and blood groups. Susceptibility to HIV infection was attributed to having blood group AB (Noori et al., 2022) However, limited studies have been done on HIV in relation to ABO and Rhesus blood groups (Motswaledi et al., 2013). Therefore, this study establishes the prevalence of ABO and Rhesus blood groups among HIV infected patients. With these findings, blood group distribution data in HIV seropositive adults was made

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to ascertain the prevalence of various ABO/Rhesus blood groups in adult population at the study site. The data created forms baseline data in the region to be referenced during ABO-Rhesus blood group and HIV disease research not only in the region but nationwide and within the east Africa community.

2.2.2 HIV disease progression by assessing viral load and CD4 T-Cell counts.

Studies carried out in Asia particularly in India revealed that the inheritance of blood groups and the consequent inheritance of certain immunological features may affect the development of the HIV infection (Sayal et al., 1996). This could impact the immune response during HIV infection. Studies have suggested that the HIV virion do acquire host ABO antigens. This could make the virus possibly more infectious or exposed eliciting complement activation. In a study by Motswaledi et.al, 2013, genetic factors were cited as contributors to HIV susceptibility and resistance. Chanzu et al. (2015) concluded that non-secretor phenotype may confer certain degree of protection against HIV. Immune recognition of HIV-1 virion carrying acquired blood group antigens from the host might be neutralized by antibodies in a person with incompatible blood types (Fang et al., 2025) This could impact viral load changes in HIV disease.

The CD4 cell count has been an important component of HIV treatment and care programs since HIV was identified as an infection compromising the immune system. In a study by Neil et al. (2005), it was observed that HIV target cells that express antibody and complement receptors. In the process of opsonization of virions, infection of these cells is enhanced. This requires further investigations into the mechanisms surrounding HIV infection with consideration of the host blood group.

For healthcare providers, the CD4 cell count has guided key clinical decisions ranging from when to start antiretroviral therapy (ART) to whether or not to screen for or provide prophylaxis against opportunistic infections (World Health Organization, 2014). CD4 testing is evolving to be an essential baseline test in the assessment of HIV disease progression and in monitoring advanced HIV disease (Ford et al., 2017). During HIV disease progression the HIV viral burden leads to $CD4^{+}$T cell destruction; the mature cell, progenitor cells and the cell in the central nervous system are all affected. This results in failure of T cell production and immune suppression (Tsukamoto, 2019). In a study by Cassenote et al. (2018) on $CD4^{+}$ T cell count and viral load data, it was observed that $CD4^{+}$ T cell count, and viral load data are the laboratory biomarkers for management and monitoring of HIV disease progression. Therefore, viral load is a very useful marker of early and sustained response in HIV treatment. Limited information is currently available on the relationship between HIV viral load and ABO-Rhesus blood groups whereas for CD4 cell counts there are some studies that have found significant association to ABO blood groups. In one study, a significant association was observed where blood group A and AB had highest CD4 counts with a conclusion that blood group antigens are involved in immune protection thus confer slow disease progression (Bamisaye et al., 2017) Association of these biomarkers with the ABO-Rhesus blood groups in this study contributes to available data and informs future studies thus may inform disease management strategies.

2.2.3 ABO-Rhesus Blood Groups and Disease

Genetic factors, including ABO and Rhesus blood groups, play a crucial role in the development of HIV disease. Studies have suggested that blood group phenotypes could influence susceptibility to viral diseases (Lell et al., 1999). Rhesus blood groups and ABO are the generational hereditary factors influenced by the selection pressure and play a significant role in the blood transfusion and transplantation medicine. These blood groups are relevant in terms of immune reactions particularly rejection and incompatibility as well as have been attributed to negative disorders such as Rhesus disease and abortion (Hassanzandeh et al., 2012). Blood group antigens act as pathogen receptors which enable pathogen colonization, invasion or escape of host immune clearance (Spear et al., 1992). The genetic connection of HIV-related disease, including HIV-Tuberculosis (TB) -associated Immune Reconstitution Syndrome (IRIS), has been examined, although insufficient attention has been given to the importance of blood group differences (Ma et al., 2018). As an example, Botswana study reported that the Rhesus Antigens C and E were correlated with HIV-negative status, whereas the blood group Jka, P1, and Lub was correlated with HIV-positive status indicating that blood group antigens are determinants of HIV disease state.

Immunological responses linked to the occurrence, course, and severity of diseases are linked to blood group antigens (Cooling, 2015). In addition to transfusion medicine, ABO blood groups have been implicated with cardiovascular diseases and cancer among others. Studies on infectious diseases, like malaria, have shown that group O is more prevalent in endemic regions, supporting the hypothesis of evolutionary advantages tied to blood group distribution (Zerihun et al., 2011). Furthermore, blood type O has been observed to have a higher incidence of HIV infection, necessitating further research to explore the role of ABO antigens in HIV disease progression (Siransy et al., 2015). In summary the following ABO blood group antigen mechanisms have been shown to influence HIV disease state; ABO incompatibility where the ABO-expressing virions are neutralized by naturally occurring antibodies (Jacobs et al., 2023), secretor status where incidence of HIV was increased in blood group A secretors in comparison to B, AB and O (Chanzu et al., 2015) and HIV binding made easy by certain ABO antigens (Davison et al., 2018).

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2.2.4 Opportunistic infection prevalence per blood group among HIV infected

HIV infected patients develop a clinical latent period between HIV infection and clinical signs and symptoms of AIDs (Clinical stage 1). Minor signs and symptoms begin to appear in clinical stage 2. Life threatening infections begin to develop in clinical stage 3, with wasting and development of opportunistic infections. Patients develop advanced HIV disease or AIDs in clinical stage 4 (Weinberg & Kovarik, 2010).

Enzymes bring about biochemical reactions that are critical in human disease. Enzyme alterations and lack causes variability in glycan expression, thus affecting normalcy or directly contributing to disease causation. Enzyme deficiencies in humans form the basis of blood groups that impact fundamental areas in medicine, including the possibility of infection and severity of infectious disease, bleeding risk, transfusion medicine, and tissue/organ transplantation. (Jajosky et al., 2022). A study by Shahapur and Bidri (2014) shows that pulmonary tuberculosis was the most prevalent opportunistic infection (OI) with 43.6% of all cases. Other OI prevalence was as follows; Candidiasis (30.9%), cryptosporidium diarrhea (21.8%), herpes zoster (16.3%), cryptococcal meningitis (3.63%), *Pneumocystis jirovecii* pneumonia (1.81%), and other miscellaneous diseases (23.6%). One patient was found in HIV infection stage I while 13 patients each were in stage II or stage III. Due to the varying patterns of OIs that differ widely, it is necessary to correlate spectrum of OIs among HIV infected individuals in their specific blood groups (Shahapur & Bidri, 2014).

In another study the overall prevalence of most OIs reduces especially after the introduction of Highly Active Antiretroviral Therapy (HAART). However significant differences exist in the trends of different OIs in different geographical areas (Rubaihayo et al., 2015). The ABO blood group association with opportunistic infections that were nosocomial as per Zhong et al. (2023) found that blood group B and AB were susceptible to *Staphylococcus aureus*, AB was susceptible to urinary tract infections, B was susceptible to skin and soft tissue infection while B and AB were susceptible to deep incision infection. This study was therefore seeking to establish the existing prevalence of opportunistic infections across the different blood groups among HIV infected participants. This is because there is a need for specific factors including genetic factors, in this case the ABO and Rhesus phenotypes to be properly identified to enable the development and implementation of targeted disease management strategies.

III. METHODOLOGY

3.1 Study Design

The current study was cross-sectional and retrospective in nature as it aimed at examining ABO and Rhesus blood groups with respect to HIV-positive patients who were on care at the Kericho County Referral Comprehensive Care Clinic. In addition to mapping these distributions, the study examined the relationship between individual blood group phenotypes and particular HIV disease variables, namely CD4+ T-cells counts, viral load, and the prevalence of opportunistic infections. The cross-sectional design provided a representation of blood group trends at a particular time in this population, which could be utilized in future epidemiological and clinical studies in the area.

3.2 Study Population and Sampling

The subjects were the adult individuals (18 years and above) with HIV who attended the Kericho County Referral Comprehensive Care Clinic in 2020. Patients who had received bone marrow transplants or blood transfusion were excluded because they would confound the study due to the changes of blood group antigens. The total number of participants was calculated to be 285 using the Yamane Taro formula of computing the sample size.

3.3 Data Collection

Data sampling was done by reviewing patient records and direct testing. Blood typing was performed using venous blood samples in ethylenediaminetetraacetic (EDTA) tubes. The ABO and Rhesus blood groups were determined using commercially available antisera. The FACSCalibur flow cytometer, was used to count the CD4 + T-cells, and the viral load were done using the Abbott m2000sp/rt system. Information about opportunistic infections was extracted out of the patient records that had data about the diagnosis and the clinical stage of opportunistic infection based on the World Health Organization (WHO) HIV staging system (Weinberg & Kovarik, 2010).

3.4 Data Analysis

Data analysis was performed in SPSS version 26. The characteristics of the study population were summarized using descriptive statistics (mean, standard deviation, and prevalence). The Chi-square test was used to examine the links between ABO and Rhesus blood groups and the occurrence of opportunistic infections. The statistical test (ANOVA) was employed to establish the presence of significant differences in CD4+ T-cell counts and viral load across the types of blood groups. Regression was performed to assess the predictive potential of blood group on HIV progression indices (CD4 counts and viral load).

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3.5 Ethical Considerations

This study was ethically approved by the institutional management of Kericho County Referral Comprehensive Care Clinic. The informed consent of all participants was obtained, and all personal data were de-anonymized to ensure the protection of confidentiality. Every data process was ethically designed to guarantee the privacy and security of patient information.

IV. FINDINGS & DISCUSSIONS

4.1 Demographic Profile of the Study Participants

As presented in Table 1, there were more female (61%), than male study participants (39%) in this study. The majority n= 199 (70%) were married. The ages ranged from 18 to 87 years, with a mean ±SD of 43±13 years. The Nilotic ethnic group constituted the largest proportion, n=248 (87%) The mean weight before ART was 57.85(15.28) after ART was 66.44(14.71). The mean clinical stage before ART (1.68(0.95)) and after ART 1.75(0.99). Mean duration on ART treatment was 6.35(8.15) and mean baseline CD4 was 278.4(265.5). Gender, age and marital status had a statistically insignificant association with CD4 count (>0.05). The differences in blood group distribution across the ethnic groups was however not statistically significant at 5% level of significance (p=0.99) However, there was as significant mean difference between weight before ART and Weight after ART (p<0.05). Across all the three time points in which VL was recorded, the majority, (>80%) had viral loads below the detection limit (LDL). The mean viral load measured six months after initiating ART was 5299.4±4271.1. The mean viral load at an annual routine test was 2797.1±25293.1.

Table 1

Demographic Profile of the Study Participants

Variable	**N (285), Min-Max**	**n (%), mean (SD)**	**p-value**
Gender			
Female	174	61.1	0.146
Male	111	38.9	
Marital status			
Not married	86	30.2	0.591
Married	199	69.8	
Age (years)			
18-24	27	9.5	
25-29	18	6.3	
30-34	34	11.9	
>35	206	72.3	
	18-87	42.8(12.8)	0.486
Ethnicity			
Nilotic	248	87.0	0.99
Bantu	36	12.6	
Cushite	1	0.35	
Clinical			
Weight Before ART (kg)		57.85(15.28)	0.00
Weight After ART (kg)		66.44(14.71)	
Clinical Stage Before ART		1.68(0.95)	
Clinical Stage After ART		1.75(0.99)	
Duration on ART (years)		6.35(8.15)	
CD4+Tcell counts (count/µl)		278.4(265.5)	
Viral Load at six months (copies/ml)		5299.4(4271.1)	
Total LDL at six months		245(86)	
Viral Load at one Year (copies/ml)		1416.1(7714.6)	
Total LDL at one year		243(85.3)	
Annual Routine Viral Load (copies/ml)		2797.1(25293.1)	
Total LDL at annual routine visit		223(78.2)	

4.2 The Distribution of ABO-Rhesus Blood Groups

The first objective was to determine the distribution of ABO-Rhesus blood groups among HIV infected study participants. Most of the study participants were found to have O-positive blood 45.6% (n=130). The A-positive blood group was the second most common at 26.0% (n=74), while AB-negative was the least common, n= 2 (0.7%). The

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proportions did not vary significantly from the distribution in the general population. The differences were not statistically significant at 5% level of significance with; p=0.73, p=0.83, p=0.71, p=0.62, p=0.95 and p=0.56 for A+ve, B+ve, AB+ve, O+ve, A-ve, B-ve, O-ve respectively, Table 2 details the results.

Table 2
ABO-Rhesus Blood Groups Distribution

Blood group	Frequency (n)	Percent (%)	General population (percent %) *	Z(p-value)
A +ve	74	26.0	24.0	0.35(0.73)
B +ve	55	19.3	18.0	0.22(0.83)
AB +ve	8	2.8	6.0	0.37(0.71)
O +ve	130	45.6	48.0	0.49(0.62)
A -ve	4	1.4	1.0	0.06(0.95)
B -ve	4	1.4	1.0	0.06(0.95)
AB -ve	2	0.7	0.0	NA
O -ve	8	2.8	4.0	0.57(0.56)

***** Based on analysis of the distribution patterns of ABO and RH D phenotypes in Kenya (Githiomi, et al., 2017)

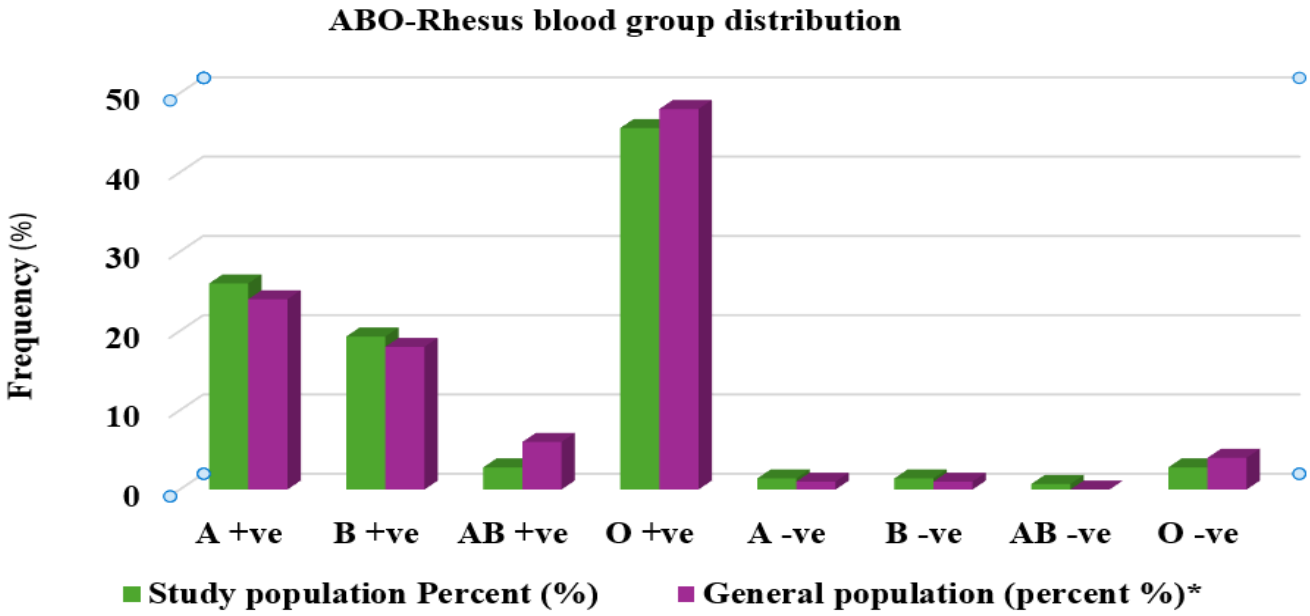

Figure 1
Shows the Overall Frequency of ABO-Rhesus Blood Groups

Based on analysis of the distribution patterns of ABO and RH D phenotypes in Kenya (Githiomi, et al., 2017). Figure 1 shows the overall frequency of ABO-Rhesus blood groups across the study population (study population and the general population) Columns shaded green indicate the study population while the columns shaded purple indicate the general population.

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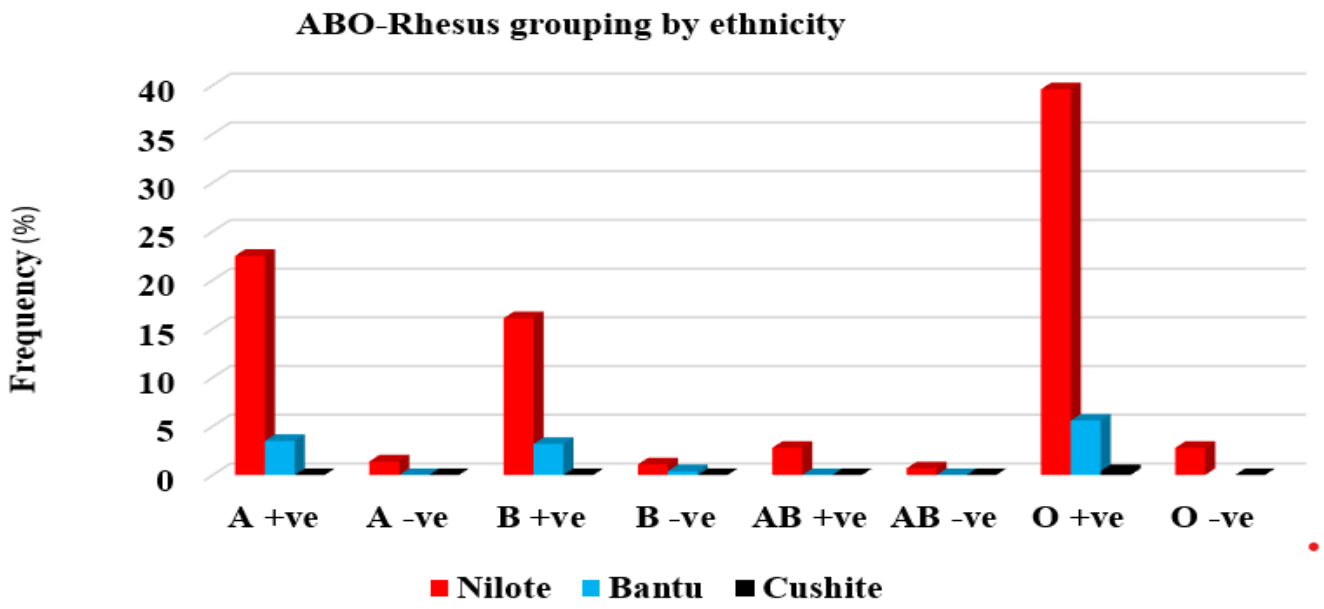

Figure 2
Shows the Overall Frequency of ABO-Rhesus Blood Groups

Figure 2 shows the overall distribution of ABO-Rhesus blood groups across the study population based on ethnicity. Columns shaded red indicate Nilotic population, (22.5%,1.4%,16.1%,1.1%,2.8%,0.7%,39.6% and 2.8%) while the columns shaded blue indicate the Bantu (3.5%,0%,3.2%,0.4%,0%,0%,5.6% and 0%) respectively while the Cushite population were 0.4% blood group O +ve only.

4.3 The Association between ABO-Rhesus Blood Groups and Viral Load, CD4+T-Cell Counts.

The second objective was to assess the association between ABO-Rhesus blood groups and viral load, as well as the $CD4^{+}$T-Cell counts among HIV infected study participants.

4.3.1 Effect of ABO-Rhesus Blood Groups on Annual Routine Viral Load

A one-way ANOVA was conducted to examine the effect of blood group on the annual routine viral load. The results showed that blood group had no significant effect on the annual routine viral load, $F(7,267) = 0.62$, $p = 0.74$, $\eta^2 = 0.02$, as presented in Table 3.

Table 3
ANOVA Results for VL by Blood Group

VL Annual Routine	Sum of Squares	df	Mean Square	F	p value	η^2
Between groups	2780403057.34	7	397200436.763	0.62	0.74	0.02
Within groups	172508768426.20	267	646100256.278			
Total	175289171483.54	274				

4.3.2 Effect of ABO-Rhesus Blood Groups on CD4+Tcell Counts

A one-way ANOVA conducted to examine the effect of blood group on the baseline CD4+T cell count. The results showed that blood group had no significant effect on CD4+Tcell counts, $F(7,194) = 0.49$, $p = 0.84$, $\eta^2 = 0.02$, as presented in Table 4.

Table 4
ANOVA Results for CD4 by Blood Group

Baseline CD4	Sum of Squares	df	Mean Square	F	p value	η^2
Between Groups	245625.54	7	35089.363	0.49	0.84	0.02
Within Groups	13923259.35	194	71769.378			
Total	14168884.89	201				

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4.3.3 Viral Load Changes

Changes in viral load were calculated as the difference between the measurement at 6 months after ART initiation (used as the baseline) and the annual routine viral load measurement. Most of the study participants, 75.6% (n=214) had no change in their viral loads between the two times, 12.7% had higher viral loads at the annual routine viral load measurements compared to the baseline, whereas n=33 (11.7%) had reduced viral loads at the annual routine viral load time. Figure 3 illustrates the results.

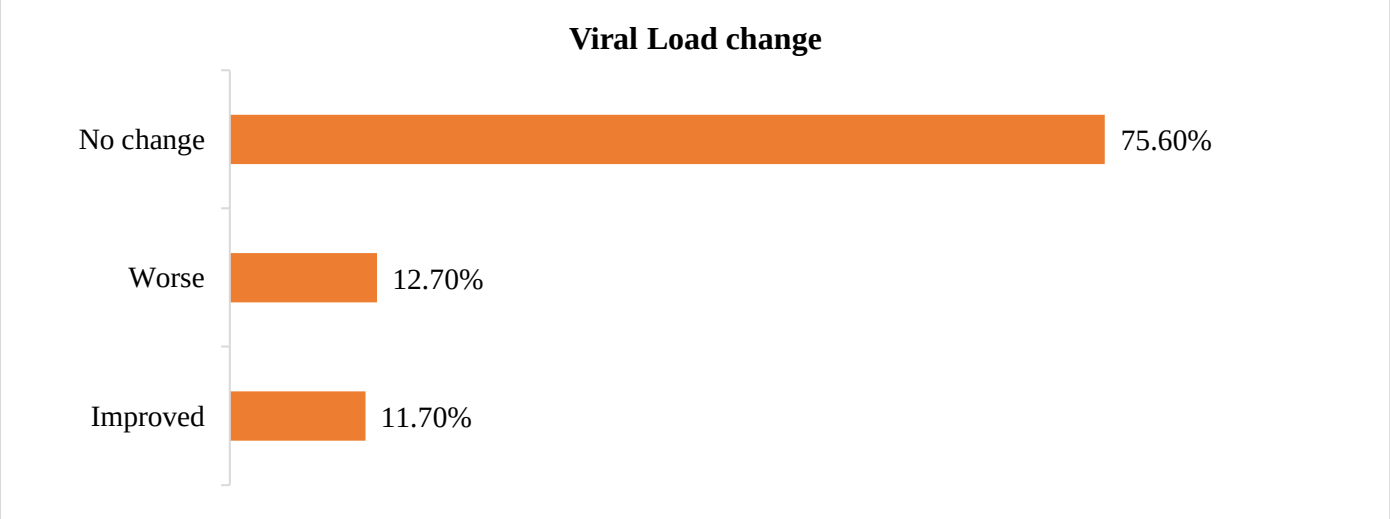

Figure 3
Viral Load Change

4.3.4 Other Predictors for Viral Load Change

To determine the other predictors of VL change, an ordinal logistic regression was used. Study participants with blood group AB-positive were found to be 6.77 times more likely to have an improvement in their viral loads compared to those with A-positive blood group (OR= 6.77, 95% c.i. [1.82-14.33], p= 0.01). Further, those with good adherence to ARV regimen were 4.4 times as likely to have reductions in their viral loads compared to the poorly adherent study participants (OR= 4.38, 95% ci [1.80-13.62], p= 0.04). Table 5 details the results.

Table 5
Predictors of VL Change

Factor	Category	OR (95% c.i)	p value
Blood group and Rhesus	O -ve	1.19(0.19-7.31)	0.85
	AB -ve	0.8(0.38-1.71)	0.57
	B -ve	1.3(0.01-190.11)	0.92
	A -ve	0.54(0.17-1.79)	0.32
	O +ve	1.23(0.62-2.43)	0.55
	AB +ve	6.77(1.82-14.33)	**0.01***
	B +ve	1.62(0.77-3.44)	0.20
	A +ve	REF	
ARV adherence	Good	4.38(1.80-13.62)	**0.04***
	Poor	REF	
WHO clinical staging pretherapy	4	1.26(0.11-14.79)	0.85
	3	1.19(0.58-2.43)	0.63
	2	1.61(0.62-4.18)	0.33
	1	REF	
Age		1.02(0.99-1.04)	0.21
BMI baseline		0.97(0.92-1.03)	1.03(0.97-1.09)

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4.4 Opportunistic Infection Prevalence in Relation to Blood Group

Most of the study participants did not develop any opportunistic infection n= 209 (73.3%) Figure 4. Of those who had opportunistic infections, pulmonary tuberculosis was the most prevalent (n=42, 15%), followed by oral candidiasis (n= 13, 4.7%) as shown in Table 6.

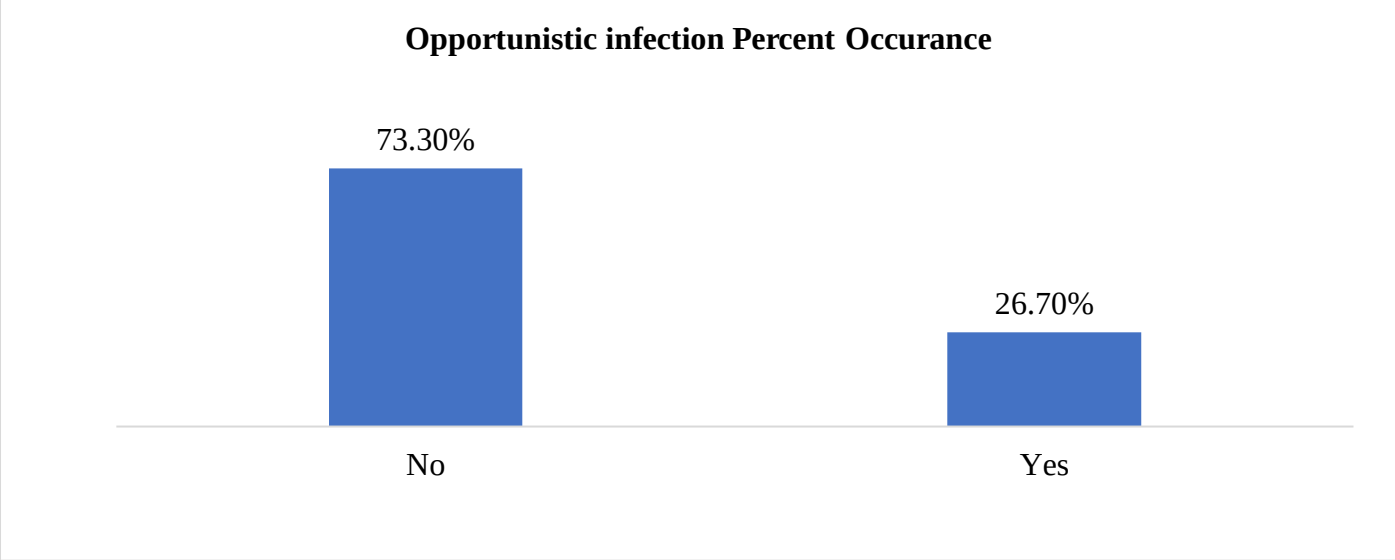

Figure 4
Opportunistic Infections Occurrence

Table 6
Distribution of Opportunistic Infections Prevalence

Infection	Frequency(n)	Percent (%)
None	209	73.3
Pulmonary Tuberculosis	42	14.7
Oral candidiasis	13	4.6
Cryptococcal Meningitis	5	1.8
Extrapulmonary Tuberculosis	7	2.5
Pneumonia	5	1.8
Herpes Zoster	2	0.7
Cancer Cervix	1	0.4
Kaposi Sarcoma	1	0.4

Analyzed by blood group, tuberculosis (both pulmonary and extrapulmonary) was the most prevalent among A-positive blood group (16.2%), B positive (16.4%), O-positive (17.7%), and B-negative. All of those with blood group A-negative, and AB-negative developed no opportunistic infections. These differences were, however, not statistically significant at the 95% level of significance (p= 0.91) as presented in Table 7.

Table 7
Opportunistic Infection Prevalence between Blood Groups

Blood group	Opportunistic Infection					Chi (p value)
	None n (%)	Tuberculosis n (%)	Oral candidiasis n (%)	Cryptococcal meningitis n (%)	Others n (%)	
A +ve	51(68.9)	12(16.2)	5(6.8)	3(4.1)	3(4.1)	18.70(0.91)
B +ve	43(78.2)	9(16.4)	0(0)	0(0)	3(5.5)	
AB +ve	6(75)	1(12.5)	0(0)	1(12.5)	0(0)	
O +ve	94(72.3)	23(17.7)	7(5.4)	1(0.8)	5(3.8)	
A -ve	4(100)	0(0)	0(0)	0(0)	0(0)	
B -ve	3(75)	1(25)	0(0)	0(0)	0(0)	
AB -ve	2(100)	0(0)	0(0)	0(0)	0(0)	
O -ve	6(75)	1(12.5)	1(12.5)	0(0)	0(0)	

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As detailed in Table 8, a binary logistic regression was used to determine the predictors of the occurrence of opportunistic infections among the study participants. Both pre-therapy and the routine after therapy clinical staging were found to be significant determinants of opportunistic infection occurrence. Study participants presented at stage 4 pretherapy were 6 times more likely to suffer the infections compared to stage 1 study participants (OR= 6.23, 95% c.i [1.05-12.49]), while those presented with stage 2 were 3 times as likely (OR= 3.36, 95% c.i [1.04-8.67]) as stage 1 pretherapy study participants.

Study participants at stage 4 were determined to be almost thrice as likely as those in stage 1 to develop opportunistic infections (OR= 2.93, 95% c.i [1.74-6.97]), whereas stage 3 study participants were 4% less likely compared to the reference group (OR=0.96, 95% c.i [0.2-4.61]) Every unit increase in the baseline $CD4^{+}$T-Cell count was associated with a 1% reduction in the likelihood of opportunistic infections, while every unit increase in body mass index (BMI) at the baseline was associated with a 13% lower likelihood of opportunistic infections. Additionally, every unit increase in the viral load at six months post initiation was linked with a 1% increase in the likelihood of developing an opportunistic infection (OR= 1.01, 95% c.i [0.99-1.80])

Table 8

Determinants of Opportunistic Infection Occurrence

Factor	Category	OR (95% CI)	P value
Blood group & Rhesus	O -ve	0.11(0.35-3.6)	0.22
	AB -ve	0.96(0.59-1.58)	0.56
	B -ve	0.69(0.39-7.37l)	0.76
	A -ve	0.89(0.64-1.24)	0.53
	O +ve	0.68(0.31-4.74)	0.70
	AB +ve	0.58(0.19-0.83)	
	B +ve	0.47(0.45-4.92)	0.53
	A +ve	REF	
Clinical staging pre-therapy	4	6.23(1.05-12.49)	**0.01***
	3	0.83(2.68-4.28)	0.35
	2	3.36(1.04-8.67)	**0.05***
	1	REF	
Routine after therapy clinical staging	4	2.93(1.74-6.97)	**<0.01***
	3	0.96(0.2-4.61)	**0.04***
	2	1.96(0.82-3.84)	0.13
	1	REF	
Duration on ART		0.9(0.75-1.09)	0.29
Baseline CD4		0.99(0.97-1.01)	**0.03***
BMI baseline		0.87(0.77-0.99)	**0.03***
Routine after therapy BMI		1.04(0.94-1.15)	0.40
VL 6/12		1.01(0.99-1.80)	**0.01***
VL annual routine		1.00(0.99-1.06)	0.20

4.5 Discussion

4.5.1 Demographic Profile of HIV Patients

The demographic data about the study participants indicated that a greater number of individuals were females (61) than males (39), congruent with the National Syndemic Disease Control Council (NSDCC, 2024) report of a greater female prevalence (4.5) relative to males (2.2) in HIV infection. This observation is in line with the results of other researchers who found that the HIV prevalence is also greater in females (Mercy et al., 2020). The average age of the respondents stood at 43 years, which falls under the age group of 35-44 years of age which is reported to be the most affected by HIV (Enquselassie & Girma, 2009). Majority of the participants were married as well, as Foglia et al. (2008) suggested in the Kericho region. This could suggest socio-economic and behavioural predictors of HIV transmission as the marital status could be the determinant of sexual behaviour and access to HIV-related medical care, as well as the relevance of region-specific research. The fact that the study sample is predominantly Nilotic (87%), is suggestive of the ethnic diversity of the Kericho County, but it also shows why region-specific studies are important. It was also established that clinical measures do change significantly with the introduction of ART, including weight gain, which is in line with the effectiveness of ART in improving the nutritional status and overall health.

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4.5.2 Distribution of ABO-Rhesus Blood Groups among HIV-Infected Patients

Analysis of the HIV-positive participants revealed that blood group O-positive was the most common (45.6%), followed by A-positive (26%) and B-positive (19.3%). This distribution closely mirrors findings from Gabon (Ngassaki et al., 2018) and Nigeria (Aliyu et al., 2025), where blood group O also predominated. Statistical comparisons indicated no significant deviation from expected patterns, with p-values ranging from 0.73 to 0.95 across the different blood groups. The predominance of Rhesus-positive individuals in this cohort (93.7%) is consistent with broader trends reported in Africa, where Rhesus-positive status is overwhelmingly common (Doku et al., 2022). Establishing this background is important, as it provides a genetic and epidemiological context for interpreting how ABO and Rhesus blood groups may influence the progression of HIV within the Kericho County population.

4.5.3 Association between ABO-Rhesus Blood Groups and Viral Load, CD4+ T-Cell Counts

The results of the One-Way ANOVA indicated no significant difference in the blood group on annual routine viral load ($p = 0.74$) or CD4+T cells ($p = 0.84$) count. This is also in line with the results of Motswaledi et al. (2013), who did not determine any significant association between HIV progression markers and blood group. This implies that, although blood group might play a role in determining the vulnerability to HIV, it did not play any significant role in determining the markers of disease progression such as CD4 + T-cell count or the viral load. However, blood group AB-positive was more likely to have an improvement in viral loads compared to A-positive blood group ($p = 0.01$). This pattern indicates that the blood group AB could also contribute to the inhibition of the viral load and additional investigation is required to establish these results and to identify the mechanisms. This could also be explained by the high adherence to ART by the participants, indicating that, ART compliance as opposed to genetic influences such as blood group may be the more important variable in this cohort in terms of its effects on viral load reduction and restoration of T-cell CD4+.

4.5.4 Opportunistic Infections in Relation to Blood Group

The rates of opportunistic infections (OIs) in the present research were relatively low, as 73.3 percent of the participants did not acquire any OIs. The most frequent OI was pulmonary tuberculosis (TB) (14.7%), and oral candidiasis (4.6%). This discovery that TB was the most common OI is similar to findings as indicated in other case studies held in sub-Saharan Africa e.g. Vajpayee et al. (2003) which indicated that TB is the most prevalent OI among HIV-positives. Nevertheless, no difference was observed in this research between the blood group and the incidence of OIs ($p = 0.91$). This implies that, although blood group can contribute to its disposition to disease, other factors including immune performance, compliance to ART and other co-infections like TB might be more influential in the occurrence of OIs. The results are consistent with those of Bamisaye et al. (2017), who discovered no significant correlation between ABO blood groups and the prevalence of OIs in people with HIV. However, the paper did note that blood group A-negative and AB-negative individuals did not develop any OIs although it was not significant.

4.5.5 Predictors of Opportunistic Infections

The binary logistic regression indicated that pre-therapy and routine clinical staging, baseline CD4+ T-cell count, BMI, and viral load are significant predictors of the presence of opportunistic infection. Those with presentation at clinical stage 4 before therapy were 6 times likely to develop OIs than their counterparts at stage 1 ($p = 0.01$). Correspondingly, individuals in stage 2 were found to be 3 times more prone to OIs ($p = 0.05$). These results highlight the significance of clinical staging with regard to predicting the risk of opportunistic infections, which supports the importance of disease progression in the occurrence of opportunistic infections. It was also found that each unit increment in viral load at six months after the onset of ART was linked to a 1 percent increment in the probability of acquiring an OI ($p = 0.01$). This helps to justify the idea that the constant replication of viruses helps to worsen the state of the immune system, exposing a patient to opportunistic infections.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined the distribution of ABO and Rhesus blood groups among HIV-positive individuals attending the Kericho County Referral Comprehensive Care Clinic, with a particular focus on their relationship to key HIV disease markers such as CD4+ T-cell counts, viral load, and the occurrence of opportunistic infections. The blood group distribution did not differ significantly from that of the general population, with blood group O being the most prevalent and blood group AB the least. The analysis did not reveal any significant association between blood group and either viral load or CD4+ counts. This suggests that, although blood group antigens may play a role in susceptibility to HIV infection, they appear to have little influence on the subsequent course of disease progression. An interesting observation was the marginal association between the AB-positive blood group and improved viral load suppression,

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though this finding remains tentative and warrants further investigation in larger cohorts. Opportunistic infections were relatively rare in the study population, with tuberculosis emerging as the most common. However, no clear relationship was established between blood group type and the prevalence of these infections. Taken together, these findings underscore the central importance of antiretroviral therapy adherence and clinical staging in the management of HIV progression and related complications, rather than genetic factors such as ABO or Rhesus blood group status.

5.2 Recommendations

According to the results of this study, it is suggested that more studies should be carried out to identify more genetic markers and how they may affect the progression of HIV especially in sub-Saharan Africa. Research into these issues may provide more insight into how genetic characteristics other than ABO and Rhesus blood groups may affect the outcomes of HIV. Moreover, it is important to reinforce ART adherence interventions since adherence is one of the most important interventions that can help enhance the outcomes of treatment and avoid opportunistic infections. The healthcare providers must focus on raising patient awareness on the need for consistent ART use to ensure viral control and improved immune functioning. Moreover, the most appropriate management of HIV should be associated with regular and thorough clinical surveillance, which is necessary and concerned with such important biomarkers as CD4+ T-cell counts, viral load, and clinical staging. This will make it possible to use more individualized treatment methods and interventions. Since there were no substantial results on the blood group relationship with the disease progression in this study, more localized studies in various regions of Kenya are required. These studies may assist in clarifying the role of genetic factors, including those of blood group, in making progression of HIV more noticeable in particular populations. Additionally, genetic factors and adherence to ART should be strengthened as parts of the public health policy included in HIV care programs. Lastly tuberculosis infection surveillance needs to be heightened given the increased chances over other opportunistic infections. This would improve patient outcomes and make HIV management policies more responsive to the needs of diverse populations. With this also, the healthcare systems will be able to enhance the quality of care they offer to people with HIV, especially in areas with similar HIV prevalence rates to that of Kericho County.

REFERENCES

Aliyu, S., Gatuwa, A., & Dimas, Y. (2025). Assessment of ABO and Rh D blood groups in patients attending HIV/AIDS clinic Federal Teaching Hospital Gombe. *Bayero Journal of Medical Laboratory Science, 4*(1), 71–75. https://www.ajol.info/index.php/bjmls/article/view/296074

Anstee, D. J. (2010). The relationship between blood groups and disease. *Blood, 115*(23), 4635–4643. https://doi.org/10.1182/blood-2010-01-261859

Bamisaye, E. O., et al. (2017). Association between blood group antigens, CD4 cell count and haemoglobin electrophoretic pattern in HIV infection. *International Journal of Life Sciences Scientific Research, 3*(5), 1300-1304. https://doi.org/10.21276/ijlssr.2017.3.5.6

Batool, Z., Durrani, S. H., & Tariq, S. (2017). Association of ABO and Rh blood group types to hepatitis B, hepatitis C, HIV and syphilis infection, a five year' experience in healthy blood donors in a tertiary care hospital. *Journal of Ayub Medical College, Abbottabad: JAMC, 29*(1), 90–92. https://pubmed.ncbi.nlm.nih.gov/28712183/

Blackwell, C. C., Dundas, S., James, V. S., Mackenzie, D. A., Braun, J. M., Alkout, A. M., Todd, W. T., Elton, R. A., & Weir, D. M. (2002). Blood group and susceptibility to disease caused by *Escherichia coli* O157. *The Journal of Infectious Diseases, 185*(3), 393–396. https://doi.org/10.1086/338343

Capuzzo, E., Bonfanti, C., Frattini, F., Montorsi, P., Turdo, R., Previdi, M. G., Turrini, E., & Franchini, M. (2016). The relationship between ABO blood group and cardiovascular disease: Results from the Cardiorisk program. *Annals of Translational Medicine, 4*(10), 189. https://doi.org/10.21037/atm.2016.03.58

Cassenote, A. J. F., Grangeiro, A., Escuder, M. M., Abe, J. M., & Segurado, A. A. C. (2018). Validation of CD4+ T-cell and viral load data from the HIV-Brazil Cohort Study using secondary system data. *BMC Infectious Diseases, 18*(1), 617. https://doi.org/10.1186/s12879-018-3536-4

Chanzu, N. M., Mwanda, W., Oyugi, J., & Anzala, O. (2015). Mucosal blood group antigen expression profiles and HIV infections: A study among female sex workers in Kenya. *PLoS One, 10*(7), e0133049. https://doi.org/10.1371/journal.pone.0133049

Cooling, L. (2015). Blood groups in infection and host susceptibility. *Clinical Microbiology Reviews, 28*(3), 801–870. https://doi.org/10.1128/CMR.00109-14

Davison, G. M., Hendrickse, H. L., & Matsha, T. E. (2018). The relationship between immunogenic red blood cell antigens and human immunodeficiency virus infection. *Transfusion and Apheresis Science, 57*(1), 58–62. https://doi.org/10.1016/j.transci.2017.11.033

Licensed Under Creative Commons Attribution (CC BY-NC)

Dean, L. (2005). Blood groups and red cell antigens. In *The ABO blood group* (Chapter 5). National Center for Biotechnology Information (US). https://www.ncbi.nlm.nih.gov/books/NBK2267/

Doku, G. N., Agbozo, W. K., Annor, R. A., Mawudzro, P. E., & Agbeli, E. E. (2022). Frequencies and ethnic distribution of ABO and RhD blood groups in the Volta region of Ghana, towards effective blood bank services. *African Health Sciences, 22*(1), 641–647. https://doi.org/10.4314/ahs.v22i1.74

Dotz, V., & Wuhrer, M. (2016). Histo-blood group glycans in the context of personalized medicine. *Biochimica et Biophysica Acta, 1860*(8), 1596–1607. https://doi.org/10.1016/j.bbagen.2015.12.026

Duncan, S. R., Scott, S., & Duncan, C. J. (2005). Reappraisal of the historical selective pressures for the CCR5-Delta32 mutation. *Journal of Medical Genetics, 42*(3), 205–208. https://doi.org/10.1136/jmg.2004.025346

Edgren, G., Hjalgrim, H., Rostgaard, K., Norda, R., Wikman, A., Melbye, M., & Nyrén, O. (2010). Risk of gastric cancer and peptic ulcers in relation to ABO blood type: A cohort study. *American Journal of Epidemiology, 172*(11), 1280–1285. https://doi.org/10.1093/aje/kwq299

Enquselassie, F., & Girma, S. (2009). HIV prevalence among clients with possible clinical signs of HIV infection: Using the provider initiated testing and counseling approach. *Ethiopian Medical Journal, 47*(3), 187–194. https://pubmed.ncbi.nlm.nih.gov/19954121/

Fang, Z., Jiang, W., Liu, P., Xia, N., Li, S., & Gu, Y. (2025). Targeting HIV-1 immune escape mechanisms: Key advances and challenges in HIV-1 vaccine design. *Microbiological Research, 299*, 128229. https://doi.org/10.1016/j.micres.2025.128229

Foglia, G., Sateren, W. B., Renzullo, P. O., Bautista, C. T., Langat, L., Wasunna, M. K., Singer, D. E., Scott, P. T., Robb, M. L., & Birx, D. L. (2008). High prevalence of HIV infection among rural tea plantation residents in Kericho, Kenya. *Epidemiology and Infection, 136*(5), 694–702. https://doi.org/10.1017/S0950268807009028

Ford, N., Meintjes, G., Vitoria, M., Greene, G., & Chiller, T. (2017). The evolving role of CD4 cell counts in HIV care. *Current Opinion in HIV and AIDS, 12*(2), 123–128.

Githiomi, R., Waiganjo, N., & Muna, K. (2017). The heterogeneity and distribution patterns of ABO and RH D phenotypes in the voluntary blood donors of Kenya. *Journal of Clinical Immunology and Immunopathology Research, 8*, 1–7. https://doi.org/10.5897/JCIIR2017.0082

Hassanzadeh-Nazarabadi, M., Shekouhi, S., & Seif, N. (2012). The incidence of spontaneous abortion in mothers with blood group O compared with other blood types. *International Journal of Molecular and Cellular Medicine, 1*(2), 99–104. https://pmc.ncbi.nlm.nih.gov/articles/PMC3920496/

Jacobs, G., Van den Berg, K., Vermeulen, M., Swanevelder, R., Custer, B., & Murphy, E. L. (2023). Association of ABO and RhD blood groups with the risk of HIV infection. *PLoS One, 18*(4), e0284975. https://doi.org/10.1371/journal.pone.0284975

Jajosky, R. P., Wu, S. C., Zheng, L., Jajosky, A. N., Jajosky, P. G., Josephson, C. D., Hollenhorst, M. A., Sackstein, R., Cummings, R. D., Arthur, C. M., & Stowell, S. R. (2022). ABO blood group antigens and differential glycan expression: Perspective on the evolution of common human enzyme deficiencies. *iScience, 26*(1), 105798. https://doi.org/10.1016/j.isci.2022.105798

Jeremiah, Z. A., Jeremiah, T. A., & Emelike, (2010). Frequencies of some human genetic markers and their association with *Plasmodium falciparum* malaria in the Niger Delta, Nigeria. *Journal of Vector Borne Diseases, 47*(1), 11–16. https://pubmed.ncbi.nlm.nih.gov/20231768/

Kalayanarooj, S., Rimal, H. S., Andjaparidze, A., Vatcharasaevee, V., Nisalak, A., Jarman, R. G., & Gibbons, R. V. (2007). Clinical intervention and molecular characteristics of a dengue hemorrhagic fever outbreak in Timor Leste, 2005. *The American Journal of Tropical Medicine and Hygiene, 77*(3), 534–537. https://pubmed.ncbi.nlm.nih.gov/17827374/

Kato, K., & Ishiwa, A. (2015). The role of carbohydrates in infection strategies of enteric pathogens. *Tropical Medicine and Health, 43*(1), 41–52. https://doi.org/10.2149/tmh.2014-25

Landers, S., Kapadia, F., & Bowleg, L. (2021). 1981–2021: HIV and our world. *American Journal of Public Health, 111*(7), 1180–1182. https://pubmed.ncbi.nlm.nih.gov/34191532/

Lell, B., May, J., Schmidt-Ott, R. J., Lehman, L. G., Luckner, D., Greve, B., Matousek, P., Schmid, D., Herbich, K., Mockenhaupt, F. P., Meyer, C. G., Bienzle, U., & Kremsner, P. G. (1999). The role of red blood cell polymorphisms in resistance and susceptibility to malaria. *Clinical Infectious Diseases, 28*(4), 794–799. https://doi.org/10.1086/515193

Lendabo, F., Srinivasan, V., & Rather, R. A. (2024). Prevalence of ABO and Rhesus (D) blood group and allelic frequency at blood bank of Nigist Eleni Mohammed Hospital, Ethiopia. *BioMed Research International, 2024*, 5353528. https://doi.org/10.1155/2024/5353528

Liumbruno, G. M., & Franchini, M. (2013). Beyond immunohaematology: The role of the ABO blood group in human diseases. *Blood Transfusion, 11*(4), 491–499. https://doi.org/10.2450/2013.0152-13

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Ma, J., Zhao, F., Su, W., Li, Q., Li, J., Ji, J., Deng, Y., Zhou, Y., Wang, X., Yang, H., Saksena, N. K., Kristiansen, K., Wang, H., & Liu, Y. (2018). Zinc finger and interferon-stimulated genes play a vital role in TB-IRIS following HAART in AIDS. *Personalized Medicine, 15*(4), 251–269. https://doi.org/10.2217/pme-2017-0084

Manalu, S. B. P. S., Perez Navarro, A., Fairhead, C., & Hill, A. (2025). Safety and efficacy of long-acting cabotegravir/rilpivirine versus standard oral antiretroviral therapy: A systematic review and meta-analysis. *The Journal of Antimicrobial Chemotherapy, 80*(3), 624–632. https://doi.org/10.1093/jac/dkae480

Mercy, O. H., Ifeanyi, O. E., Vincent, C. C. N., & Prayer, N. (2020). Association of ABO blood group with HIV infection. *Journal of Infectious Diseases and Microbiology, 1*(1), 1–7. https://doi.org/10.37191/Mapsci-JIDM-1(1)-001

Ministry of Health Kenya. (2018). *HIV estimates report Kenya 2018*. https://nsdcc.go.ke/wp-content/uploads/2018/11/HIV-estimates-report-Kenya-20182.pdf

Motswaledi, M. S., Kasvosve, I., & Oguntibeju, O. O. (2013). The role of red blood cells in enhancing or preventing HIV infection and other diseases. *BioMed Research International, 2013*, 758682. https://doi.org/10.1155/2013/758682

Naeini, A. E., Rostami, M., & Naeini, S. E. (2010). Chronic viral hepatitis and their relation to ABO blood groups and rhesus (Rh) factor. *Medical Case Studies, 1*(1), 5–7. https://doi.org/10.5897/MCS.9000003

National Syndemic Disease Control Council. (2024). *Epidemic Appraisal Toolkit*. https://nsdcc.go.ke/epidemic-appraisal-toolkit/

Neil, S. J., McKnight, A., Gustafsson, K., & Weiss, R. A. (2005). HIV-1 incorporates ABO histo-blood group antigens that sensitize virions to complement-mediated inactivation. *Blood, 105*(12), 4693–4699. https://doi.org/10.1182/blood-2004-11-4267

Ngassaki-Yoka, C.-D., Ndong, J. M. N., & Bisseye, C. (2018). ABO, Rhesus blood groups and transfusion-transmitted infections among blood donors in Gabon. *Sudan Journal of Medical Sciences, 13*(1), 12–21. https://doi.org/10.18502/sjms.v13i1.1685

Noori, M., Shokri, P., Nejadghaderi, S. A., Golmohammadi, S., Carson-Chahhoud, K., Bragazzi, N. L., Ansarin, K., Kolahi, A. A., Arshi, S., & Safiri, S. (2022). ABO blood groups and risk of human immunodeficiency virus infection: A systematic review and meta-analysis. *Reviews in Medical Virology, 32*(3), e2298. https://doi.org/10.1002/rmv.2298

Opi, D. H., Ndila, C. M., Uyoga, S., Macharia, A. W., Fennell, C., Ochola, L. B., Nyutu, G., Siddondo, B. R., Ojal, J., Shebe, M., Awuondo, K. O., Mturi, N., Peshu, N., Tsofa, B., Band, G., Maitland, K., Kwiatkowski, D. P., Rockett, K. A., Williams, T. N., & Rowe, J. A. (2023). Non-O ABO blood group genotypes differ in their associations with *Plasmodium falciparum* rosetting and severe malaria. *PLoS Genetics, 19*(9), e1010910. https://doi.org/10.1371/journal.pgen.1010910

Paquette, M., Dufour, R., & Baass, A. (2018). ABO blood group is a cardiovascular risk factor in patients with familial hypercholesterolemia. *Journal of Clinical Lipidology, 12*(2), 383–389.e1. https://doi.org/10.1016/j.jacl.2017.12.001

Purna, A. S., Bagavathiammal, P., Rajput, S. A. K., Kiran, S., Seralathan, G., Thamizhvanan, P., Nallasivam, P., & Panneerselvam, P. (2024). Frequency of ABO blood groups in HIV infected individuals in Khammam-Telangana. *International Journal of Pharmaceutical and Clinical Research, 16*(3), 1038-1042. http://www.ijpcr.com/

Raska, M., & Novak, J. (2010). Involvement of envelope-glycoprotein glycans in HIV-1 biology and infection. *Archivum Immunologiae et Therapiae Experimentalis, 58*(3), 191–208. https://doi.org/10.1007/s00005-010-0072-3

Rubaihayo, J., Tumwesigye, N. M., & Konde-Lule, J. (2015). Trends in prevalence of selected opportunistic infections associated with HIV/AIDS in Uganda. *BMC Infectious Diseases, 15*, 187. https://doi.org/10.1186/s12879-015-0927-7

Sayal, S. K., Das, A. L., & Nema, S. K. (1996). Study of blood groups in HIV seropositive patients. *Indian Journal of Dermatology, Venereology and Leprology, 62*(5), 295–297. https://pubmed.ncbi.nlm.nih.gov/20948093/

Shahapur, P. R., & Bidri, R. C. (2014). Recent trends in the spectrum of opportunistic infections in human immunodeficiency virus infected individuals on antiretroviral therapy in South India. *Journal of Natural Science, Biology, and Medicine, 5*(2), 392–396. https://doi.org/10.4103/0976-9668.136200

Sharjeel, S., Wasi, M., Jafri, A., Raza, F. A., Tariq, Z., Shamim, K., Abbas, K., & Ahmed, M. (2021). The correlation between blood group type and diabetes mellitus type II: A case-control observational study from Pakistan. *Cureus, 13*(11), e19898. https://doi.org/10.7759/cureus.19898

Siransy, L. K., Nanga, Z. Y., Zaba, F. S., Tufa, N. Y., & Dasse, S. R. (2015). ABO/Rh blood groups and risk of HIV infection and hepatitis B among blood donors of Abidjan, Côte D'ivoire. *European Journal of Microbiology & Immunology, 5*(3), 205–209. https://doi.org/10.1556/1886.2015.00029

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Spear, P. G., Shieh, M. T., Herold, B. C., WuDunn, D., & Koshy, T. I. (1992). Heparan sulfate glycosaminoglycans as primary cell surface receptors for herpes simplex virus. *Advances in Experimental Medicine and Biology, 313*, 341–353. https://doi.org/10.1007/978-1-4899-2444-5_33

Teixeira, V. de P., Martins, E., Almeida, H. de O., Soares, S., de Souza, H. M., & de Morais, C. A. (1987). Sistema ABO e formas anatomoclínicas da doença de Chagas crônica [The ABO system and anatomoclinical forms of chronic Chagas disease]. *Revista da Sociedade Brasileira de Medicina Tropical, 20*(3), 163–167. https://doi.org/10.1590/s0037-86821987000300007

Tsukamoto, T. (2019). HIV impacts CD34+ progenitors involved in T-cell differentiation during coculture with mouse stromal OP9-DL1 cells. *Frontiers in Immunology, 10*, 81. https://doi.org/10.3389/fimmu.2019.00081

Vajpayee, M., Kanswal, S., Seth, P., & Wig, N. (2003). Spectrum of opportunistic infections and profile of CD4+ counts among AIDS patients in North India. *Infection, 31*(5), 336–340. https://doi.org/10.1007/s15010-003-3198-y

Weinberg, J. L., & Kovarik, C. L. (2010). The WHO clinical staging system for HIV/AIDS. *The Virtual Mentor: VM, 12*(3), 202–206. https://doi.org/10.1001/virtualmentor.2010.12.3.cprl1-1003

Wolofsky, K. T., Ayi, K., Branch, D. R., Hult, A. K., Olsson, M. L., Liles, W. C., Cserti-Gazdewich, C. M., & Kain, K. C. (2012). ABO blood groups influence macrophage-mediated phagocytosis of *Plasmodium falciparum*-infected erythrocytes. *PLoS Pathogens, 8*(10), e1002942. https://doi.org/10.1371/journal.ppat.1002942

World Health Organization. (2014). *HIV/AIDS cure research glossary & resource guide*.

World Health Organization. (2024). *The Global Health Observatory*. https://www.who.int/data/gho/data/themes/hiv-aids

Yeda, R., Okudo, C., & Owiti, E. (2022). Burden of malaria infection among individuals of varied blood groups in Kenya. *Malaria Journal, 21*, 251. https://doi.org/10.1186/s12936-022-04251-1

Zerihun, T., Degarege, A., & Erko, B. (2011). Association of ABO blood group and *Plasmodium falciparum* malaria in Dore Bafeno Area, Southern Ethiopia. *Asian Pacific Journal of Tropical Biomedicine, 1*(4), 289–294. https://doi.org/10.1016/S2221-1691(11)60045-2

Zhong, X., Wang, D. L., Xiao, L. H., Mo, L. F., & Luo, X. F. (2023). ABO blood groups and nosocomial infection. *Epidemiology and Infection, 151*, e64. https://doi.org/10.1017/S0950268823000432

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Estimation du stock de carbone et potentiel de la biodiversite ligneuse à sequestrer le carbone en milieux urbains: Cas de la ville de Bunia en province de l'Ituri (RDC)

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RESUME

La biodiversité ligneuse joue un important rôle écosystémique de réduction de dioxyde de carbone à travers le processus de la photosynthèse pour le bien être de l'homme et pour certains autres êtres vivants. Malheureusement ce processus est souvent négligé ou mal connu en milieux urbains. Cette étude réalisée en ville de Bunia (RDC) a permis de développer, grâce aux mesures dendrométriques, les modèles spécifiques des équations allométriques pour estimer le stock de carbone séquestré par la biodiversité ligneuse des milieux urbains, cas de la ville de Bunia (RDC). 21 parcelles de 100mx100m chacune ont été installées pour les inventaires des arbres à la hauteur de la poitrine (Dhp ≥ 10 cm), soit à 1,30 m au-dessus du niveau de sol en raison de 7 parcelles par commune dans les trois communes (Mbunya, Nyakasanza et Shari) que compose la ville de Bunia. Les résultats obtenus grâce à la méthode non destructive de la biomasse aérienne ont montré que 2311 arbres ont été inventoriés. La biomasse aérienne totale obtenue pour les arbres inventoriés dans le milieu d'étude est estimée à 1 759 055,50 kg (1 759,06 tonnes), ce qui correspond à un stock de carbone estimé à 879 527,75 kg (8 795,27 tonnes) de carbone. L'Equivalent CO2 est de 237 472,49 kg (2 374,72 tonnes). L'équivalent CO2 par arbre est estimé à 124,39 kg de CO2. La quantité estimée de carbone séquestré pour une moyenne de 110,05 arbres/ha de la ville de Bunia est estimée à (47 658,53 ± 27 275,93) /ha. La quantité estimée de carbone absorbée par un arbre dans le milieu d'étude est de (380,58 kg) de carbone/arbre. Un constat fait observer une variabilité des stocks de carbone dans toutes les parcelles et/ou des communes. La valeur statistique F (183,99) est également très élevée et très statistiquement significative (p-value < 0,001). Cela signifie qu'il y a une différence très significative des quantités du stock de carbone estimée dans les trois différentes communes. Cinq espèces ligneuses contribuent efficacement au stockage de carbone dans cette ville. L'espèce d'*Eucalyptus globulus* absorbe plus le carbone estimée à (61%) par rapport aux autres espèces; *Mangifera indica* contribue au stockage de carbone à (14%), *Persea americana* absorbe à (9%), *Grevillea robusta* absorbe le carbone à la hauteur de (7%) et *Senna siamea* stocke le carbone estimé à 5%. Cela justifie que la quantité de carbone séquestré par la biodiversité ligneuse varie d'une espèce à une autre. Six espèces possèdent les bois qui stockent plus le carbone que les autres, il s'agit de: *Eucalyptus globulus* qui stocke 30 021,18 kg de carbone; *Mangifera indica* suit avec 5 028,44 kg; *Pinus montana* a stocké 3 938,54 kg de carbone; *Grevillea robusta* (1 718,16 kg); *Albizia chinensis* (1 718,76 kg) et *Persea americana* (1 347,77 kg de carbone). Le constat est que la quantité du stock de carbone est fonction de la qualité du bois de l'arbre bien que certaines espèces ont la même densité du bois numérique. Ces résultats obtenus dans ce travail contribuent à l'effort d'une gestion durable des écosystèmes urbains enfin de réduire les gaz carboniques (CO2) et aussi pour atténuer les impacts environnementaux dus au changement climatique. Nous suggérons que les études futures, devraient envisager le développement d'équations allométriques localement calibrées, par des méthodes destructives ou des techniques non destructives avancées telles que le LiDAR terrestre pour compléter les résultats de ce travail. La collecte de données primaires sur la densité du bois des espèces locales, ou la collaboration avec des laboratoires d'anatomie du bois, permettrait d'améliorer la précision des estimations de carbone.

Mots-Cles : Biodiversité, Boisés, Environnements Estimation, Ituri, Potentiel, Province, RDC, Séquestration, Stock de Carbone, Urbains, Ville de Bunia

ABSTRACT

Woody biodiversity plays a significant ecosystem role in reducing carbon dioxide through photosynthesis for the well-being of humans and other living things. Unfortunately, this process is often neglected or poorly understood in urban environments. This study, conducted in Bunia (DRC), utilized dendrometric measurements to develop specific allometric equations to estimate the carbon stock sequestered by woody biodiversity in urban environments, specifically in the city of Bunia (DRC). 21 plots, each 100m x 100m, were established for tree inventories at breast height (DBH ≥ 10 cm), which is 1.30 m above ground level, with seven plots per commune in the three communes (Mbunya, Nyakasanza, and Shari) that make up the city of Bunia. The results from the non-destructive aboveground biomass method showed that 2,311 trees were inventoried. The total aboveground biomass for the

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inventoried trees in the study area is estimated at 1,759,055.50 kg (1,759.06 tons), which corresponds to an estimated carbon stock of 879,527.75 kg (8,795.27 tons) of carbon. The CO2 equivalent is 237,472.49 kg (2,374.72 tons). The CO2 equivalent per tree is estimated at 124.39 kg of CO2. The estimated quantity of sequestered carbon for an average of 110.05 trees/ha in Bunia is estimated at (47,658.53 ± 27,275.93.)/ha. The estimated quantity of carbon absorbed per tree in the study area is (380.58 kg) of carbon/tree. An observation was made of the variability of carbon stocks across all plots and/or communes. The statistical F-value (183.99) is also very high and statistically significant (p-value < 0.001). This means there is a very significant difference in the estimated carbon stock quantities in the three different communes. Five woody species effectively contribute to carbon storage in this city. The species *Eucalyptus globulus* absorbs the most carbon, estimated at (61%) compared to other species; *Mangifera indica* contributes to carbon storage at (14%), *Persea americana* absorbs (9%), *Grevillea robusta* absorbs carbon at (7%), and *Senna siamea* stores an estimated 5% of carbon. This justifies that the quantity of carbon sequestered by woody biodiversity varies from one species to another. Six species have wood that stores more carbon than others: *Eucalyptus globulus*, which stores 30,021.18 kg of carbon; *Mangifera indica* follows with 5,028.44 kg; *Pinus montana* has stored 3,938.54 kg of carbon; *Grevillea robusta* (1,718.16 kg); *Albizia chinensis* (1,718.76 kg); and *Persea americana* (1,347.77 kg of carbon). The finding is that the quantity of carbon stock is a function of the quality of the tree's wood, although some species have the same numerical wood density. The results obtained in this work contribute to the effort of sustainable management of urban ecosystems to reduce carbon gases (CO2) and also to mitigate the environmental impacts of climate change. We suggest that future studies should consider developing locally calibrated allometric equations using destructive methods or advanced non-destructive techniques such as terrestrial LiDAR to complement the results of this work. The collection of primary data on the wood density of local species, or collaboration with wood anatomy laboratories, would improve the accuracy of carbon estimates.

Keywords: Biodiversity, Carbon Stock, City of Bunia, Estimation, Ituri, and DRC, Potential, Province, Sequester, Urban Environments, Woody

I. INTRODUCTION

Les composants atmosphériques tels que, l'azote (78,1%), l'oxygène (20,9%), un certain nombre de gaz à l'état de trace dont l'argon (0,93%), l'hélium et les gaz à effet de serre (GES) (Ramarson, 2009) contribuent grandement au changement climatique. l'effet de serre qui n'est qu'un processus qui permet à l'atmosphère de se maintenir à une température de +15°C, condition indispensable à la vie sur terre. Les gaz à effet de serre sont les constituants gazeux de l'atmosphère tant naturels qu'anthropiques, qui absorbent et émettent un rayonnement à des longueurs d'ondes données du spectre du rayonnement infrarouge thermique émis par la surface de la terre, l'atmosphère et les nuages. La vapeur d'eau (H_20), le dioxyde de carbone (CO_2), l'Oxyde nitreux (N_2O), le méthane (CH_4) et l'Ozone (O_2) sont les principaux gaz à effet de serre présents dans l'atmosphère. Parmi ces gaz, le dioxyde de carbone (CO_2) est le gaz le plus abondant dans l'atmosphère. L'augmentations des émissions du gaz carbonique (CO_2) au niveau mondial, avec l'urbanisation croissante d'ici 2030, provenant du milieu urbain devraient atteindre 76% (Laïlle, et *al*., 2013 ; Vroh et *al*., 2014).

Toutefois, les plantes utilisent le processus de la photosynthèse pour absorber le CO_2 et rejeter de l'O_2 utilisable par les autres êtres vivants pour la respiration. Le CO_2 est converti en différents composés organiques qui constituent le matériel végétal contenu dans le bois, l'écorce et dans les feuilles. Cela contribue donc à la diminution du CO_2 dans l'atmosphère. Dans les milieux urbains ce processus est souvent négligé ou mal connu. Compte tenu de l'ampleur des émissions de CO_2, si les villes et leurs autorités ne prennent pas des mesures pour atténuer le changement climatique, la situation risque d'être inquiétante. Les conséquences des activités anthropiques sur les écosystèmes urbains peuvent être difficiles à cerner.

Les types des plantes en particulier les vieux arbres ou vieilles forêts ont une capacité de stocker une quantité supérieure de carbone que les jeunes plantes et cela d'une espèce à une autre. Le taux de séquestration de carbone ralentisse avec l'âge de l'arbre et leur masse déjà existante constitue un réservoir important de carbone accumulé pendant les décennies. Une grande densité de la végétation augmente généralement le stock de carbone. Quant à la séquestration de carbone (absorption), les jeunes plantes et les jeunes forêts sont très efficaces pour séquestrer le carbone de l'atmosphère. Leur croissance rapide nécessite une grande quantité de carbone qu'elles absorbent par la photosynthèse pour construire leur biomasse (tronc, branches, feuilles, écorces et racines). Plus la croissance est rapide, plus le taux d'absorption de CO_2 est élevé.

La biodiversité arborescente en milieux urbains joue un rôle crucial dans la séquestration de carbone. Toutefois sa dégradation due aux activités anthropiques fait que le CO_2 atmosphérique augmente avec comme conséquence principale le changement climatique. La vitesse moyenne du réchauffement climatique est observée au cours des cinquante dernières années et varie de 0,10 à 1,16 °C par décennie, elle est environ le double de la vitesse moyenne observée pendant les cent dernières années (GIEC, 2007).

La mise en œuvre des stratégies d'atténuation et de lutte contre le changement climatique nécessite les estimations précises de la biomasse aérienne, des stocks de carbone (Gibbs et *al.*, 2007) et le choix d'un modèle allométrique approprié (Fayolle et *al*., 2018). Les prédictions du modèle pantropical pour les forêts humides ont toutefois été jugées impartiales et précises au Cameroun (Fayolle et *al*., 2013) mais ont montré une surestimation de 40% au

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Gabon (Ngomanda et *al.*, 2014), bien que dans ce dernier site, l'équation de la forêt humide soit appropriée. La sélection du modèle allométrique approprié parmi un ensemble de modèles existants n'est donc pas simple, comme l'a également montré en Colombie (Alvarez et *al.*, 2012). Les équations allométriques pantropicales ont été récemment révisées (Chave et *al.*, 2014).

En République Démocratique du Congo (RDC) en général et en particulier dans la ville de Bunia, on observe actuellement une croissance démographique galopante qui fait pression sur les espaces verts en milieux urbains, à la recherche des espaces pour la construction des infrastructures routières, des maisons d'habitation, l'installation des camps des déplacés des guerres dans la ville de Bunia et des espaces des loisirs, exploitation des bois de chauffage pour l'énergie et l'agriculture périurbaine. Cela a comme conséquences; la dégradation des écosystèmes urbains et l'augmentation des pollutions atmosphériques en particulier le CO_2 due à ces activités anthropiques. Cette dégradation de la biodiversité végétale qui joue le rôle d'atténuer les impacts dus au changement climatique par l'absorption des gaz carbonique (CO_2).entraine ainsi une perte d'important stock de carbone. Le manque des données chiffrées en terme d'estimation du stock de carbone séquestré par la biodiversité végétale, en particulier ligneuse en milieu urbain et une connaissance limitée de leur importance constituent un défi de taille pour contribuer à l'atténuation des impacts environnementaux dus au changement climatique.

Pour contribuer à l'effort d'atténuation du réchauffement climatique par la réduction des émissions de dioxyde de carbone (CO_2) par la biodiversité ligneuse, la présente étude se démarque d'une part, à développer les équations allométriques spécifiques pour combler le manque des données quantitatives sur le stock de carbone (C) des milieux urbains et d'autre part, à utiliser une nouvelle approche non destructive et identifier les espèces les plus adaptées qui contribuent le plus au stock de carbone séquestré dans les milieux urbains; cas de la ville de Bunia et en particulier dans ses trois communes (Mbunya, Nyakasanza et Shari) en province de l'Ituri (RDC).

1.1 Objectif de la Recherche

i. Développer, grâce aux mesures dendrométriques, les modèles spécifiques des équations allométriques pour estimer le stock de carbone séquestré par la biodiversité ligneuse des milieux urbains, cas de la ville de Bunia.
ii. Déterminer le potentiel des espèces ligneuses du milieu urbain de Bunia à séquestrer le carbone

1.2 Hypothèses de Recherche

Ho_1 : Différents modèles des équations allométriques spécifiques des milieux urbains sont développés pour estimer le stock de carbone séquestré par la biodiversité ligneuse.

Ho_2 : Le potentiel des espèces ligneuses à séquestrer le stock de carbone en milieu urbain de Bunia varie d'une espèce à l'autre au sein de ses trois communes.

II. MÉTHODOLOGIE

2.1 Milieu d'étude

Le présent travail s'est déroulé dans les trois communes (Mbunya, Nyakasanza et Shari) de la ville de Bunia, chef-lieu de la province de l'Ituri en République Démocratique du Congo (RDC). Elle est située au Nord-est du pays aux environs du lac Albert (Mobutu) qui constitue en partie la frontière avec l'Ouganda. Dans sa partie Est, elle se situe en dessous des chaines des montagnes des Monts bleus qui forment le flanc occidental du rift albertin du lac Albert au Nord à l'extrémité septentrionale du lac Kivu en passant par le lac Edouard (Robyns, 1948). Cette ville est située sur la latitude : 30° 15'00'' Est, la longitude : 1° 34'00'' Nord et sur l'altitude moyenne de 1250 m. Elle s'étend sur une superficie de 5 760 ha = 57,6 km^2 (Figure 1) (Tshinyama et *al.*, 2023).

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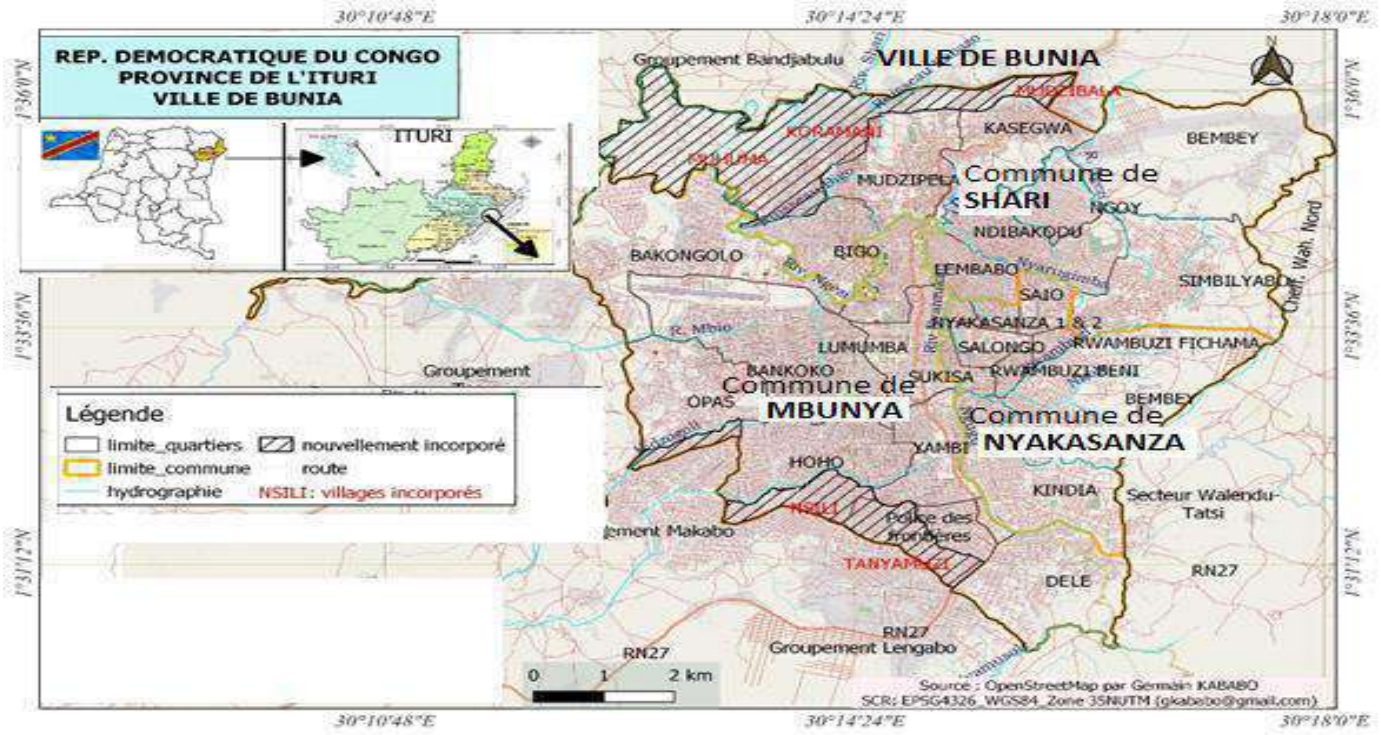

Figure 1
Carte Administrative de la Province de l'Ituri à l'aide de QGIS 3.22 (Source ; présent travail).

2.2 Méthodes

2.2.1 Méthodes de collecte des données

Pour atteindre les objectifs de cette étude qui se veut proposer les modèles spécifiques d'équations allométriques grâce aux mesures dendrométriques pour estimer le stock de carbone séquestré par la biodiversité ligneuse en milieu urbain de Bunia spécifiquement dans ses trois communes (Mbunya, Nyakasanza et Shari), les inventaires des arbres et des arbustes à la hauteur de la poitrine (Dhp ≥ 10 cm), soit à 1,30 m au-dessus du niveau de sol, ont été effectués pour collecter les données en vue de comparer le stock de carbone séquestré par les arbres au sein de ces différentes communes de la ville de Bunia. Dans chaque commune, 7 parcelles d'inventaire dont chacune avait une superficie d'un hectare, soit 100m x 100 m de côté, ont été installées en tenant compte de la densité possible des arbres observés dans les différents quartiers que compose la ville de Bunia. Ces parcelles étaient installées suivant les protocoles de Dallmeier et *al.*, (1992) et de Picard et *al.*, (2008) a boussole du GPS nous a servi pour l'orientation et le pentamètre pour la mesure de la distance d'une parcelle d'inventaire. Le Vertex IV laser a servi à mesurer la longueur de l'arbre inventorié, le mètre ruban était utile pour prendre les mesures de circonférences des arbres inventoriés enfin de calculer les diamètres. Le choix de ce dispositif d'une manière aléatoire dans les différents quartiers de la ville de Bunia a permis d'inventorier tous les arbres et arbustes à Dhp ≥ 10 cm en parcourant les distances (25m) entre les layons au sein de la parcelle pour éviter d'oublier et/ou de répéter l'inventaire d'un arbre déjà inventorié.

2.2.2 Méthodes d'analyse des données

L'allométrie est la relation entre une mesure d'arbres (généralement sa biomasse) et une autre mesure, plus facilement mesurable sur le terrain, c'est-à-dire le diamètre et/ou la hauteur de l'arbre (Picard et *al.*, 2012). Une équation allométrique est une expression mathématique qui formalise cette relation de manière quantitative (Fayolle et *al.*, 2018).

Les équations allométriques sont des outils précieux pour estimer la biomasse et, par extension, le stock de carbone dans les arbres urbains. Elles établissent une relation mathématique entre une variable facile à mesurer (comme le diamètre à hauteur de poitrine, DHP) et une variable plus difficile à mesurer directement comme la biomasse aérienne. Elles permettent également d'évaluer le stock de carbone d'un grand nombre d'arbres sans les abattre. Bien que moins précises que les méthodes destructives, elles offrent une bonne estimation du stock de carbone.

En raison des lacunes constatées en matière des équations allométriques spécifiques qui peuvent changer d'une zone géographique à une autre (Nowak et *al*, 1996; Jo, 2002; Kouadio et *al*, 2016), nous avons utilisé les équations allométriques relatives à la biodiversité ligneuse des zones urbaines pour cette étude. Les équations adaptées aux arbres en milieu urbain, car leur croissance peut être différente de celles des forêts naturelles en raison des contraintes d'espace, de la gestion (taille, élagage) et des conditions du sol. Il est crucial d'utiliser la densité du bois appropriée pour chaque espèce d'arbre urbain de savane. Les densités du bois des espèces des savanes peuvent varier significativement

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de celles des espèces des forêts denses humides. Les arbres des savanes (et encore plus en milieu urbain) ont souvent une structure plus trapue, des cimes plus larges et des troncs plus courts que leurs homologues des forêts denses.

Les équations développées pour les forêts denses peuvent sous-estimer ou surestimer la biomasse de ces arbres à cause de ces différences structurales. Pour cette étude, une méthode non destructive de la biomasse a été utilisée pour estimer la biomasse aérienne (AGB) qui correspond au stock de carbone séquestré par la biodiversité ligneuse. Les modèles d'équations allométriques spécifiques des milieux urbains sont développés pour calculer les stocks de carbone en utilisant les paramètres dendrométriques notamment; le diamètre à la hauteur de poitrine (Dhp) et la hauteur de l'arbre inventorié (Brown et *al*., 1989; Brown, 1997 et Kouadio et *al*., 2016). Nous avons estimé le stock de carbone séquestré par la biodiversité ligneuse de la ville de Bunia en utilisant quatre équations allométriques spécifiques de formes générales pour les arbres des milieux urbains comme suite ;

(1) $AGB = Biom_t$ (Arbres urbains) = 0,16155 x $DHP^{2,310647}$

Où : -AGB = Biomasse aérienne (en kg/tige).

DBH= Diamètre à la hauteur de la poitrine en cm.

Une fois que la biomasse totale de l'arbre est estimée, le stock de carbone est calculé en appliquant un facteur de conversion. La recommandation générale de GIEC (2007) est d'utiliser un facteur de conversion de 0,5 (50%) pour le carbone.

(2) Stock de Carbone (kg) = Biomasse aérienne (kg) × 0,5.

En incluant la hauteur (m), une excellente équation allométrique plus performante qui est spécifique en milieux urbains et aux zones boisées qui incluent les savanes urbaines africaines a été retenue (Kuyah et *al*., 2012; Aabeyir, R et *al*, 2020). Étant donné que la spécificité des régions des savanes (arbres plus épars, structures différentes, espèces adaptées à l'aridité), il est préférable d'utiliser les équations allométriques développées pour ces écosystèmes, notamment l'équation ci-après (3):

(3) $AGB=0,0580\times\rho\times (DBH^2\times H)^{0,999}$

Où : - H = Hauteur totale de l'arbre (en m) mesurée à l'aide d'un vertex IV Laser;

DBH (D) = Diamètre à la hauteur de poitrine (en cm);

(ρ)= Densité spécifique du bois (en g/cm³) qui varie d'une espèce à une autre. L'inclusion de la densité du bois (ρ) de l'espèce dans l'équation allométrique améliore grandement la précision du stock de carbone. Il est noté que la densité du bois (ρ) spécifique aux espèces locales présentes dans la zone d'étude est déterminée par les bases des données fiables (www.wood-database.com). Si l'espèce n'est pas dans une base de données, une moyenne pour le genre ou la famille, ou une valeur moyenne pour les espèces de savane de la région est prise en compte (*Global Wood Density Database ;* Tropix (Cirad). les valeurs de la densité sont souvent données pour un bois séché à l'air (environ 12 % d'humidité).

Pour calculer la masse molaire du CO_2, la masse du carbone est additionné avec celle des deux oxygènes de la manière suivante; masse molaire du CO_2 = masse de C + (2 * masse de l'O). La masse atomique du carbone (C) est d'environ 12,01 g/mol. La masse atomique de l'oxygène (O) est d'environ 16,00 g/mol. Ainsi, la masse molaire du CO_2 = 12,01 + (2 * 16,00) = 12,01 + 32,00 = 44,01 g/mol. Le facteur de conversion est calculé par la proportion de carbone dans le CO_2 en divisant la masse atomique du carbone par la masse molaire du CO_2: Le facteur de conversion = masse de C / masse molaire du CO_2 = 12,01 / 44,01 ≈ 0,2728, souvent arrondi à 0,2727 ou. 0,27.

(4) Un équivalent CO_2 (kg) absorbé = Stock de carbone (kg) × 0,27.

Un kg de CO_2 est multiplié par 0,27 (ou 0,2727) pour trouver le nombre de kg de carbone pur qui sont contenues dans cette masse de CO_2. En milieux urbains, pour obtenir l'équivalent en CO_2 absorbé. le stock de carbone est multiplié par un facteur de 0,27 (Brown & Lugo, 1982 ; Baker et *al*., 2004 ; GIEC, 2007).

III. RÉSULTATS ET DISCUSSIONS

3.1 Estimation du Stock de Carbone Séquestré par la Biodiversité Ligneuse dans la ville de Bunia

Pour estimer le stock de carbone contenu dans la biodiversité ligneuse du milieu urbain de Bunia, un certain nombre des relations allométriques spécifiques a été déterminé. Le stock de carbone obtenu dans la biomasse aérienne montre une variabilité spatiale entre les communes (Tableau 1). Légende: Parcelles d'inventaire (P1, P2, P3, P4, P5, P6 et P7) pour les communes de Mbunya, de Nyakasanza et de Shari; AGB=Biomasse aérienne (kg/ha), (F)=Test statistique, EQ.CO2 =équivalent carbone (kg/ha), Arbre/ha/com.= arbre par hectare pour chaque commune et Moy./ha/Com.(kg)= moyenne à l'hectare par commune en kg.

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Tableau 1

Biomasse Aérienne et Stock de Carbone Séquestré dans les Parcelles Pour Chaque Commune

COMMUNES									
	MBUNYA			**NYAKASANZA**			**SHARI**		
PARCELLES	**AGB (Kg/ha)**	**Stock de carbone (Kg/ha)**	**EQ. CO_2 (Kg/ha)**	**AGB (Kg/ha)**	**Stock de carbone (Kg/ha)**	**EQ. CO_2 (Kg/ha)**	**AGB (Kg/ha)**	**Stock de carbone (Kg/ha)**	**EQ.CO_2 (Kg/ha)**
P1	211 024,37	105 512,18	28 488,29	170 046,85	85 023,42	22 956,32	31 090,66	15 545,33	4 197,24
P2	116 460,84	58 230,42	15 722,21	139 200,68	69 600,34	18 792,09	89 867,23	44 933,62	12 132,08
P3	71 742,65	35 871,32	9 685,26	55 790,70	27 895,35	7 531,74	27 043,48	13 521,74	3 650,87
P4	67 303,35	33 651,68	9 085,95	60 964,81	30 482,40	8 230,25	59 449,35	29 724,67	8 025,66
P5	73 820,35	36 910,18	9 965,75	41 708,44	20 854,22	5 630,64	68 021,15	34 010,57	9 182,86
P6	73 038,53	36 519,26	9 860,20	77 889,91	38 944,96	10 515,14	94 588,17	47 294,09	12 769,40
P7	53 829,35	26 914,67	7 266,96	59 499,97	29 749,98	8 032,50	116 674,66	58 337,33	15 751,08
Total/commune	667 219,44 kg	333 609,72 kg	90 074,62 kg	605 101,36 kg	302 550,68 kg	81 688,68 kg	486 734,71 kg	243 367,35 kg	65 709,19 kg
Arbre/ha/com.	941,07kg	470,53 kg	127,04 kg	673,83kg	336,91 kg	90,97 kg	691,38 kg	345,69 kg	93,33 kg
TOTAL GENERAL	AGB (Kg)=1759055,50kg (761,17kg/arbre); Stock de Carbone (kg)=879527,75kg (380,58kg/arbre) et Eq.CO_2 (kg)=237472,49 kg (124,39kg/arbre).								
Moy./ha/Com. + Ecart-type (kg)	95317,06 ± 54551,86	47658,53 ± 27275,93	12867,80 ± 7364,50	86443,05 ± 48583,16	43221,53 ± 24291,58	11669,81 ± 6558,72	69533,53 ± 33293,43	34766,76 ± 16646,71	9387,03 ± 4494,61
Moyenne totale +Ecart -type	AGB (Kg/ha)=586351,84 ± 91691,56; Stock de Carbone (kg/ha)=293175,92 ± 45845,78; Eq. CO_2 (kg/ha)=79157,50 ±12378,35								
TEST (F)	5,50	16,50	0,55	4,7253	22,1609	16,883	9486,87	183,99	3,472
P-value	0,009	0,001	0,76	0,010778	0,000094	0,0003	0,001	0,001	0,024

L'analyse des résultats obtenus dans cette étude montre que, sur un total de 2311 arbres inventoriés dans les 21 parcelles de trois communes (Mbunya, Nyakasanza et Shari) de la ville de Bunia, la biomasse aérienne varie d'une parcelle d'inventaire à une autre et d'une commune à l'autre. Elle varie également selon la densité observée des individus et des espèces inventoriées dans chaque parcelle et/ou chaque commune.

La quantité totale de biomasse aérienne des arbres inventoriés dans la ville de Bunia est estimée à 1759 055,50kg (1 759,06 tonnes). Ce qui correspond à un stock de carbone estimé à 879527,75kg (8795,27 tonnes). L'Equivalent CO_2 total est de 237472,49kg (2374,72 tonnes). La commune de Mbunya a enregistré plus de biomasses aériennes, soit 667219,44 kg (667, 21 tonnes). La faible quantité de biomasse aérienne est obtenue dans la commune de Shari (486 734,71 kg) soit 486,73 tonnes. La quantité moyenne de carbone séquestré pour une moyenne de 110,05 arbres/ha de la ville de Bunia est estimée à (47658,53 ± 27275,93 kg/ha). La quantité de carbone absorbée par un arbre dans le milieu d'étude est estimée à (380,58 kg)/arbre.

Les arbres de la commune de Mbunya ont produit plus de biomasses aériennes (941,07 kg/arbre) contre une faible quantité de biomasses aériennes enregistrée dans la commune de Shari (691,38 kg/arbre). La valeur F (9486.87) est extrêmement élevée et très statistiquement significative (*p-value* < 0.001). Cela indique qu'il y a une différence très significative entre les biomasses aériennes obtenues dans les trois communes. Les moyennes calculées de ces biomasses aériennes le confirment visuellement à savoir; 95317,06 ± 54551,86 kg à la commune de Mbunya; 86443,05 ± 48583,16 kg à Nyakasanza contre une moyenne de 69533,53 ± 33293,43 kg pour la commune de Shari. Cette variabilité des biomasses aériennes s'observe aussi au sein des parcelles d'inventaire où la parcelle CMP1 de la commune de Mbunya a obtenu plus de biomasses aériennes (211024,37 kg/ha) soit 211,02 tonnes/ha et contre une faible quantité de biomasses aériennes enregistrée dans la parcelle CSP3 (27 043,48 kg/ha) soit (27,04 tonnes/ha) dans la commune de Shari.

La quantité totale estimée du stock de carbone pour les arbres inventoriés dans la ville de Bunia varie d'une commune à l'autre et d'une parcelle à l'autre. Les arbres de la commune de Mbunya ont séquestré une quantité de stock de carbone estimée à 333 609,72 kg (333,60 tonnes). La parcelle CMP1 de la même commune a stocké plus de carbone estimé à 105512,18 kg/ha (105,51tonnes/ha) que la commune de Shari qui a séquestré une faible quantité de carbone estimée à (243 367,35 kg) soit (243,36 tonnes). La parcelle CSP3 n'a obtenu qu'une très faible quantité estimée à 13521,74 kg/ha (13,52 tonnes/ha) dans cette commune.

Les arbres de la commune de Mbunya stockent plus de carbone soit (470,53kg/arbre), tandis que la commune de Shari a stocké une faible quantité de carbone (345,69 kg/arbre). Cette variabilité de la quantité du stock de carbone absorbée par la biodiversité ligneuse de la ville de Bunia se confirme par la valeur statistique F (183.99) qui est très élevée et très statistiquement significative (p < 0.001). Cela signifie qu'il y a une différence très significative des

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quantités du stock de carbone estimée dans les trois différentes communes. Pour l'équivalent carbone (CO_2), les arbres de la commune de Mbunya se distinguent avec 90 074,62 kg (90,07 tonnes) de CO_2 atmosphériques absorbés. La parcelle CMP1 de la même commune a enregistré une quantité supérieure de CO_2 estimée à 28 488,29 kg/ha (28,48 tonnes/ha). Les arbres de la commune de Shari où le CO_2 est faiblement absorbé (65709,19kg) soit (65,70 tonnes). Les arbres de la parcelle CSP3 de la même commune ont absorbé une très faible quantité de CO_2 atmosphérique (3 650,87 kg/ha) soit 3,65 tonnes/ha. L'Eq.CO2 est de 124,39 kg de CO_2 /arbre dans toutes les communes où il est supérieur (127,39 kg/arbre) dans la commune de Mbunya, tandis qu'à Shari, il est inférieur (93,33 kg/arbre).

3.2 Relation entre le Stock de Carbone et les Diamètres des Arbres Etudiés

L'analyse du stock de carbone absorbé en fonction des structures diamétriques groupées par classes des arbres inventoriés à la hauteur de la poitrine (DBH ≥10cm) mesuré à 1,30 m du pied de l'arbre est indispensable pour comprendre la quelle des tranches des diamètres stocke plus le carbone (Figure 2).

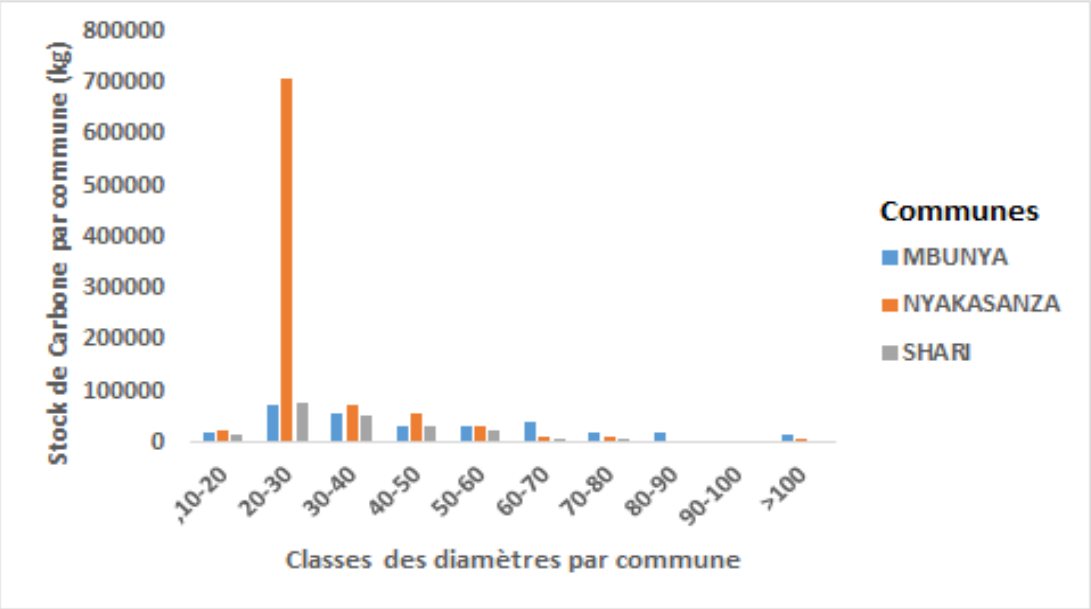

Figure 2

Illustration du Stock de Carbone en Fonction des classes des Diamètres de l'arbre par Commune.

L'analyse de cette figure (2) indique que les arbres des petites tailles surtout situés dans la classe des diamètres compris entre (20-30 cm) ont stocké plus de carbone dans la commune de Nyakasanza que dans d'autres classes où le stock de carbone diminue au fur et à mesure que les structures diamétriques des arbres augmentent.

3.3 Stock de Carbone et la Hauteur de l'arbre Inventorié

La hauteur de l'arbre est l'un des paramètres dendrométriques utilisé en méthode non destructive pour calculer la biomasse aérienne d'un arbre, le stock de carbone en fonction de la hauteur (m) des arbres inventoriés se présente dans la figue 3 ci-après ;

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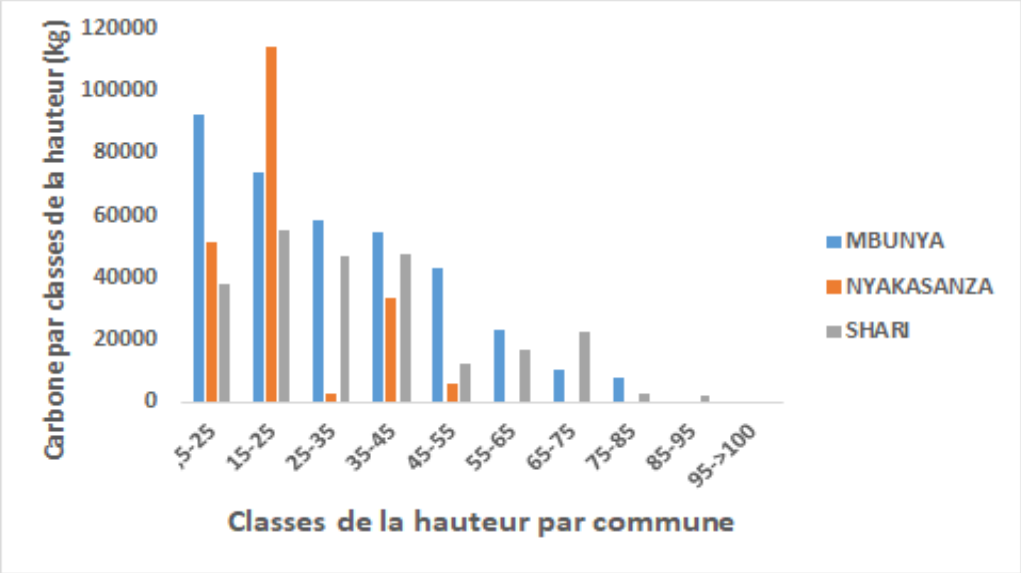

Figure 3
Présentation du Stock de Carbone en Fonction de la Hauteur des Arbres Inventoriés par Commune

Nous constatons que le stock de carbone est élevé pour les arbres des petites tailles situés entre la classe (15-25 m) des hauteurs dans la commune de Nyakasanza et diminue au fur et à mesure que la hauteur des arbres augmentent dans toutes les communes (classe ≥100 m).

3.4 Potentiel des Espèces Ligneuses et Stock de Carbone Séquestré dans les Milieux Urbains de Bunia

3.4.1 Stock de Carbone en Fonction des Espèces Recensées

Compte tenu de l'importance écologique et socio-économique des espèces ligneuses en milieu urbain, la connaissance de leur potentiel à stocker le carbone ainsi que la compréhension de leur fonction écologique est fondamentale en milieu urbain comme celui de Bunia. Le couvert végétal de cette ville est dégradé suite aux activités anthropiques, en particulier les espèces ligneuses avec comme conséquence la perte des différentes espèces végétales et l'augmentation de CO_2 dans l'atmosphère qui est la cause principale du changement climatique. Le carbone stocké dans la biomasse aérienne des arbres varie en fonction des espèces (Figure 4).



Figure 4
Illustration Du Stock de Carbone en Fonction des Espèces Recensées dans les Trois Communes

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Les résultats obtenus dans la figure 4 font observer que la quantité du stock de carbone séquestrée par la biodiversité ligneuse en milieux urbains de Bunia se diffère d'une espèce à l'autre. Cinq espèces ligneuses contribuent efficacement au stock de carbone dans la ville de Bunia. Il est important de noter que l'espèce *Eucalyptus globulus* présente des valeurs exceptionnellement élevées par rapport aux autres espèces. Ces valeurs extrêmes peuvent fortement influencer les résultats et les moyennes globales du stock de carbone du milieu d'étude.

L'*Eucalyptus globulus* vient en tête avec une contribution du stock de carbone à (61%); *Mangifera indica* enregistre un stock de carbone de (14%)*; Persea americana* contribue à l'effort de stockage de carbone à (9%); *Grevillea robusta* absorbe le carbone à la hauteur de (7%) et *Senna siamea* stocke le carbone estimé à 5%. La valeur statistique (F=10,26, *p-value* = 0,0001). Puisque la *p-valeur* est inférieure à 0.05, cela signifie qu'il existe une différence statistiquement significative entre les moyennes des différentes espèces des plantes de la ville de Bunia. D'autres espèces participent très faiblement à l'effort du stockage de carbone avec (4%), entre autres ; *Terminalia catappa, Vernonia amygdalina, Ricinus communis et Annona muricata.*

3.5 Corrélation Entre le Stock de Carbone et les Espèces Recensées

L'analyse factorielle des données mixtes (AFDM) révèle que le stock de carbone varie significativement d'une parcelle à l'autre en fonction de l'espèce telle qu'illustré par deux figures (Figure 27 A&B). De plus, la plupart d'individus et d'espèces contribuent significativement au stockage de carbone dans les parcelles, et très peu d'espèces et d'individus avaient une contribution qui s'écartait de la moyenne. Le test statistique (**F=** 69.25, *p-value*=0,10001) indique que les valeurs de carbone stocké par les espèces de la ville de Bunia sont significativement différentes les unes des autres.

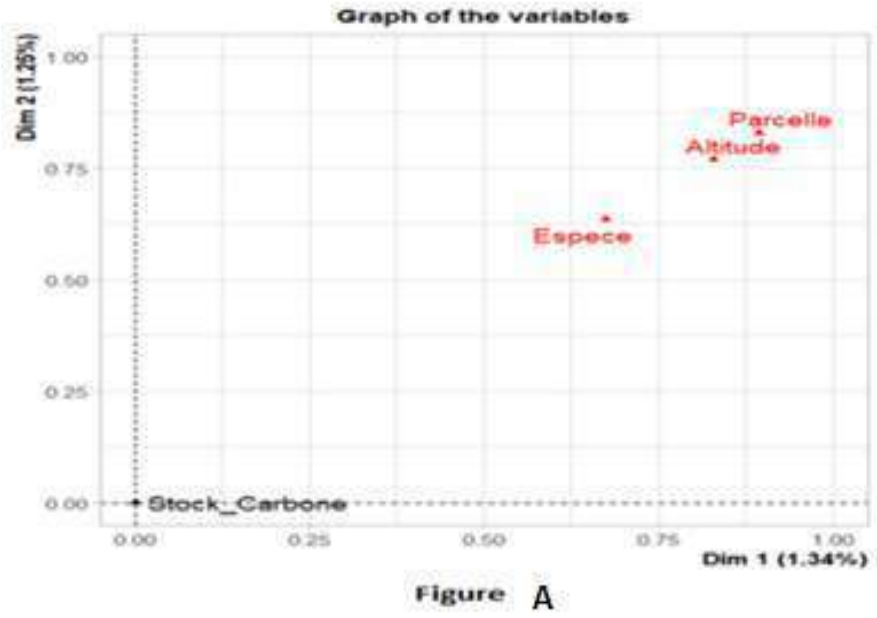

Figure 5 *A*
Poids des différentes variables dans les composantes

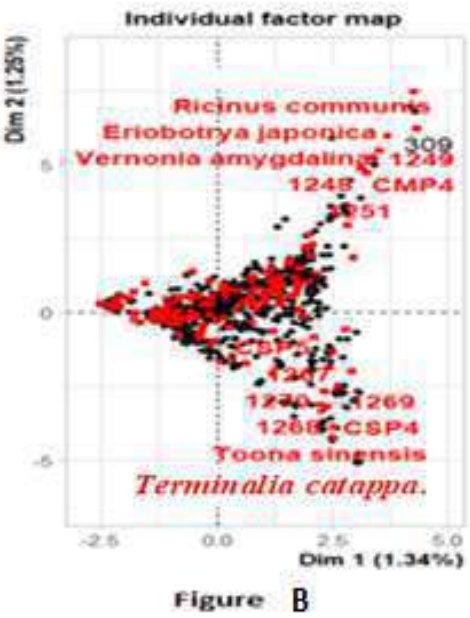

Figure 5 B
Projection des individus (points en noir) et des espèces (points en rouge) sur les composantes.

3.5.1 Relation Entre le Stock de Carbone et la Densité du bois des Espèces Recensées dans le Milieu d'étude

Les données fournies sur la densité du bois pour ce travail sont des estimations générales basées sur des informations compilées à partir de diverses sources de référence sur les propriétés du bois (www.wood-database.com). Il n'y a pas une source unique et exhaustive qui contient la densité de toutes les espèces des bois du monde, en particulier celles qui ne sont pas couramment exploitées commercialement (*Global Wood Density Database;* Tropix (Cirad)). Pour être précis, les densités données sont des moyennes ou des plages typiques car la densité d'un bois n'est pas une valeur fixe absolue, elles varient d'une espèce à l'autre, même pour une même espèce donnée, la densité du bois peut varier en fonction du taux de croissance, des conditions des sols du milieu, de l'âge de l'arbre, du type de bois et de la partie de l'arbre d'où provient le bois (Tableau 2). Légende: AGB (Biom.)=Biomasse aérienne (kg/tige);Stock de carbone (kg/tige)=Stock de carbone (kg/tige); EQ.CO2 =équivalent carbone (kg/tige) et p (g/m³)=densité du bois en (g/m³) et par espèces.

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Tableau 2

Densité du Bois et Carbone Stocké par les Espèces Recensées

ESPECES	*p* (g/m³)	AGB (Biom.) (kg/tige)	Stock de carbone (kg/tige)	EQ CO_2 (kg/tige)
Eucalyptus globulus	0,67	60 042,36	30 021,18	8 105,72
Mangifera indica	0,56	10 056,88	5 028,44	1 357,68
Pinus montana	0,45	7 877,07	3 938,54	1 063,40
Grevillea robusta	0,54	3 436,32	1 718,16	463,9
Albizia chinensis	0,32	3 437,51	1 718,76	464,06
Persea americana	0,50	2 695,54	1 347,77	363,9
Aleurites molucanus	0,14	39,18	19,59	5,29
Annona muricata	0,4	4,96	2,48	0,67
Annona reticulata	0,4	115,2	57,6	15,55
Annona squamosa	0,4	397,56	198,78	53,67
Averrhoa carambola	0,58	174,94	87,47	23,62
Clematis vitalba	0,14	479,8	239,9	64,77
Croton megalocarpus	0,70	349,99	174,99	47,25
Cupressus lucitanica	0,38	526,23	263,11	71,04
Eriobotrya japonica	0,70	671,47	335,73	90,65
Erytrina abyssinica	0,70	1 671,71	835,86	225,68
Euphorbia cotinifolia	0,2	272,65	136,32	36,81
Ficus etrangleur	0,4	575,58	287,79	77,7
Ficus mucuso	0,5	212,2	106,1	28,65
Hibiscus elatus	0,62	99,65	49,83	13,45
Leucaena glauca	0,69	2 054,69	1 027,34	277,38
Mespilus germanica	0,70	682,36	341,18	92,12
Moringa oleifera	0,25	74,08	37,04	10
Psidium guajava	0,70	2 488,96	1 244,48	336,01
Ricinus communis	0,24	46,9	23,45	6,33
Senna siamea	0,88	1 781,71	890,85	240,53
Tamarandus indica	0,80	3 131,75	1 565,87	422,79
Terminalia catappa	0,55	957,17	478,58	129,22
Toona sinensis	0,50	338,36	969,18	420,68
Ura crepitens	0,24	136,98	68,49	18,49
Vernonia amygdalina	0,70	146,23	73,11	19,74
TOTAL		**104 975,99**	**53 287,97**	**14 546,75**

L'analyse de ce tableau montre une variabilité du stock de carbone en fonction de la densité du bois et de l'espèce. Un total de 104975,99 kg de biomasses aériennes qui correspond à 53287,97 kg de carbone et à un équivalent CO_2 de 14546,75 kg ont été enregistrés pour toutes les espèces recensées dans les trois communes (Mbunya, Nyakasanza et Shari) du milieu d'étude parmi lesquelles, six espèces possèdent les bois qui stockent plus le carbone que les autres, il s'agit de: *Eucalyptus globulus* qui se distingue avec un stock de carbone séquestré *(*30 021,18 kg); *Mangifera indica (*5028,44 kg); *Pinus montana (*3938,54 kg)*; Grevillea robusta (*1718,16 kg)*; Albizia chinensis (*1718,76 kg) *et Persea americana* avec 1347,77 kg de carbone. Le constat est que la quantité du stock de carbone est fonction de la qualité du bois de l'arbre bien que certaines espèces ont la même densité du bois numérique.

3.6 Discussion

3.6.1 Estimation du Stock de Carbone Séquestré par la Biodiversité Ligneuse à Bunia

Au total 2311 arbres inventoriés dans les 21 parcelles de trois communes en raison de 7 parcelles par commune (Mbunya, Nyakasanza et Shari) que compose la ville de Bunia, la biomasse aérienne totale obtenue est estimée à 1759055,50 kg (1759,06 tonnes), ce qui correspond à un stock de carbone estimé à 879527,75 kg (8795,27tonnes) de carbone. L'Equivalent total de CO_2 est de 237472,49kg (2374,72 tonnes). La quantité estimée de carbone séquestré pour une moyenne de 110,05 arbres/ha de la ville de Bunia est de (47658,53 ± 27275,93.)/ha. La quantité de carbone absorbée par un arbre est estimée à (380,58 kg)/arbre dans le milieu d'étude. Cependant, les arbres de la commune de Mbunya stockent plus de carbone soit (470,53kg/arbre), tandis que la commune de Shari stocke à son tour une faible quantité de carbone 345,69 kg/arbre.

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Une variabilité des biomasses aériennes et des stocks de carbone est observée au sein de chaque commune. Cette variabilité de la quantité du stock de carbone absorbée par la biodiversité ligneuse de la ville de Bunia est due à la variabilité de la densité des individus, de la hauteur des arbres et aux différentes structures diamétriques des arbres inventoriés dans chaque commune. Ces arbres jouent un rôle important dans la production de biomasse aérienne qui est aussi un facteur déterminant dans le calcul du stock de carbone. La valeur statistique F (183.99) est également très élevée et très statistiquement significative (*p -value*< 0.001). Cela signifie qu'il y a une différence très significative des quantités du stock de carbone estimée dans les trois différentes communes. Vroh et *al.* (2014) ont montré que la biomasse aérienne augmente avec l'aire basale qui est liée à la grosseur des arbres. Ces résultats ont été soutenus par les études de Novak et Crane en 2002, qui ont trouvé que le stockage du carbone est influencé par le diamètre de l'arbre à maturité. Ces résultats corroborent avec ceux obtenus dans ce travail.

3.6.2 Stock de Carbone en Fonction des Espèces Recensées

Les résultats obtenus (figure 4) montrent que la quantité estimée du stock de carbone séquestré par la biodiversité ligneuse en ville de Bunia, varie d'une espèce à l'autre. L'analyse de ces résultats fait observer cinq espèces ligneuses qui contribuent grandement au stockage de carbone dans cette ville. L'espèce d'*Eucalyptus globulus* absorbe plus de carbone estimée à (61%) par rapport aux autres espèces; *Mangifera indica* contribue au stockage de carbone à (14%), *Persea americana* absorbe le carbone à (9%), *Grevillea robusta* contribue au stock de carbone à la hauteur de (7%) et *Senna siamea* stocke le carbone estimé à 5%.

La valeur statistique (F=10,26, *p-value* = 0,0001). Comme la *p-valeur* est inférieure à 0.05, cela signifie qu'il existe une différence statistiquement significative entre les moyennes des différentes espèces des plantes ligneuses. D'où l'importance de reboiser les espaces dégradés de la biodiversité ligneuse par les espèces à croissance rapide ayant un potentiel à séquestrer efficacement le carbone enfin de bien jouer le rôle compensatoire des émissions du CO_2 provenant des activités humaines.

Les résultats obtenus dans une étude au Madagascar ont montré que les plantations d'*Eucalyptus* permettent le stockage important de carbone, ces résultats peuvent être utilisés, d'après l'auteur, dans d'autres zones pour valoriser les nouvelles plantations d*'Eucalyptus* sur le marché du carbone (Ramarson, 2009).

Home et *al.*, 2009; Vroh et *al*, 2014; définissent les espèces emblématiques ou « flagship species » comme des espèces (animales ou végétales) célèbres et attrayantes qui permettent d'éveiller la prise de conscience sur la protection de l'environnement. Vroh et *al*, 2014; ont fait observer que certaines espèces jouent un rôle très important dans la reconstruction et la conservation des écosystèmes. Six espèces possèdent les bois qui leurs permettent de stocker plus le carbone que les autres, il s'agit de: *Eucalyptus globulus (*30021,18 kg); *Mangifera indica (*5 028,44 kg); *Pinus montana (*3938,54 kg)*; Grevillea robusta (*1718,16 kg)*; Albizia chinensis (*1718,76 kg) *et Persea americana (*1347,77 kg). La participation des arbres à la réduction des gaz à effet de serre dont le dioxyde de carbone (CO_2) qui contribue le plus au changement climatique est énorme (GIEC, 2001). Selon les données de la Banque mondiale en 2010 sur les émissions des gaz à effet de serre, chaque habitant émet environs 300 kg de CO_2 au niveau mondiale et varie d'un pays à un autre en fonction du mode de vie (Transport, alimentation, consommation énergétique). D'après les données du PNUD, La moyenne d'émission du CO2 par personne en RDC est plus faible (0,04 tonnes/an et 0,11 kg/jour) et varie d'une personne à l'autre. La quantité de carbone séquestré par arbre pour notre travail est estimée à 380,58 kg de carbone/arbre. Cela témoigne un caractère compensatoire des espèces arborescentes de la ville de Bunia dans la réduction des émissions de CO_2. D'où l'importance de planter les arbres dans cette ville pour réduire les gaz carbonique et contribuer à l'effort d'atténuer les impacts environnementaux dus au changement climatique.

IV. CONCLUSION & RECOMMANDATIONS

4.1 Conclusion

A l'issue de cette étude, les rôles joués par certaines espèces à stocker le carbone en milieu urbains, cas de la ville de Bunia sont mis en évidence. Parmi ces espèces appelées emblématiques qui contribuent plus au stockage de carbone que les autres espèces recensées, on note: L'*Eucalyptus globulus* contribue à 61% au stockage de carbone*; Mangifera indica* à 14%; *Persea americana* stocke 9% de carbone; *Grevillea robusta* contribue à la hauteur de 7% et *Senna siamea* avec 5% de stockage de carbone. Les résultats de ce travail indiquent aussi que la biomasse aérienne totale obtenue est estimée à 1759055,50 kg (1759,06 tonnes), ce qui correspond à un stock de carbone estimé à 879527,75 kg (8795,27tonnes) de carbone. L'Equivalent CO_2 est de 237472,49 kg (2374,72 tonnes).

La quantité de carbone séquestré pour une moyenne de 110,05 arbres/ha de la ville de Bunia est estimée à (47658,53 ± 27275,93.)/ha. L'équivalent CO_2 par arbre est estimé à 124,39 kg de CO_2. La quantité estimée de carbone absorbée par un arbre est connue (380,58 kg)/arbre dans le milieu d'étude.

Nous retenons en définitif que la biodiversité ligneuse en milieu urbain contribue efficacement à l'effort de stockage de carbone et à la réduction des gaz carbonique (CO_2) atmosphérique qui est la cause principale du changement

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climatique. La plantation des arbres en ville contribuerait également à produire des services nécessaires au bien être des citadins. Ces résultats permettront aux utilisateurs une gestion durable des écosystèmes urbains enfin de contribuer à l'effort de réduction des gaz carboniques (CO_2) et pour ainsi atténuer les impacts environnementaux dus au changement climatique.

4.2 Recommandations

Nous suggérons que les études futures devraient envisager le développement d'équations allométriques localement calibrées, par des méthodes destructives ou des techniques non destructives avancées telles que le LiDAR terrestre. La collecte de données primaires sur la densité du bois des espèces locales, ou la collaboration avec des laboratoires d'anatomie du bois, permettrait d'améliorer la précision des estimations pour compléter les résultats obtenus dans ce travail. L'analyse au laboratoire des sols échantillonnés du milieu d'étude pourrait aussi estimer avec précision la quantité du stock de carbone organique fixée par les plantes. Il est également conseillé de mettre à jour et de valider régulièrement les bases de données existantes avec des informations spécifiques à la région.

REFERENCES

Aabeyir, R., Adu-Bredu, S., Agyare, W. A., & Weir, M. J. C. (2020). Allometric models for estimating aboveground biomass in the tropical woodlands of Ghana, West Africa. *Forest Ecosystems, 7*(1), 1–23.

Alvarez, E., Duque, A., Saldarriaga, J., Cabrera, K., de las Salas, G., Del Valle, J., & Rodriguez, L. (2012). Tree above-ground biomass allometries for carbon stock estimation in the natural forests of Colombia. *Forest Ecology and Management, 267*, 297–308.

Baker, T. R., Phillips, O. L., Malhi, Y., Almeida, S., Arroyo, L., Di Fiore, A., Erwin, T., Higuchi, N., Killeen, T. J., Laurance, S. G., Laurance, W. F., Lewis, S. L., Monteagudo, A., Neill, D. A., Vargas, P. N., Pitman, N. C., Silva, J. N., & Martínez, R. V. (2004). Increasing biomass in Amazonian forest plots. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 359*(1443), 353–365. https://doi.org/10.1098/rstb.2003.1422

Brown, S. (1997). *Estimating biomass and biomass change of tropical forests: A primer*. (FAO Forestry Paper 134). Rome: Food and Agriculture Organization.

Brown, S., & Lugo, A. E. (1982). The storage and production of organic matter in tropical forests and their role in the global carbon cycle. *Biotropica, 14*, 161–187.

Brown, S., Gillespie, A. J. R., & Lugo, A. E. (1989). Biomass methods for tropical forest with applications to forest inventory data. *Forest Science, 35*, 881–902.

Chave, J., Réjou-Méchain, M., Búrquez, A., Chidumayo, E., Colgan, M. S., Delitti, W. B. C., Duque, A., Eid, T., Fearnside, P. M., Goodman, R. C., Henry, M., Martínez-Yrízar, A., Mugasha, W. A., Muller-Landau, H. C., Mencuccini, M., Nelson, B. W., Ngomanda, A., Nogueira, E. M., Ortiz-Malavassi, E., ... Vieilledent, G. (2014). Improved allometric models to estimate the aboveground biomass of tropical trees. *Global Change Biology, 20*, 3177–3190.

Dallmeier, F., Kabel, M., & Rice, R. (1992). Methods for long-term biodiversity inventory plots in protected tropical forest. In F. Dallmeier (Ed.), *Long-term monitoring of biological diversity in tropical forest areas: Methods for establishment and inventory of permanent plots* (MAB Digest 11, pp. 11–46). Paris: UNESCO.

Fayolle, A., Doucet, J. L., Gillet, J. F., Bourland, N., & Lejeune, P. (2013). Tree allometry in Central Africa: Testing the validity of pantropical multi-species allometric equations for estimating biomass and carbon stocks. *Forest Ecology and Management, 305*, 29–37.

Fayolle, A., Ngomanda, A., Mbasi, M., Barbier, N., Bocko, Y., Oyemba, F., Couteron, P., Fonton, N., Kamdem, N., Katembo, J., Kondaoule, H. J., Loumeto, J., Maïdou, H. M., Mankou, G., Mengui, T., Mofack, G. II, Moundounga, C., Moundounga, Q., Nguimbous, L., ... Medjibe, V. P. (2018). A regional allometry for the Congo basin forests based on the largest ever destructive sampling. *Forest Ecology and Management, 417*, 228–240. https://doi.org/10.1016/j.foreco.2018.07.030

Gibbs, H. K., Brown, S., Niles, J. O., & Foley, J. A. (2007). Monitoring and estimating tropical forest carbon stocks: Making REDD a reality. *Environmental Research Letters, 2*, 045023.

GIEC. (2001). *Good practice guidance for land use, land-use change and forestry*. Hayama, Japan: Intergovernmental Panel on Climate Change National Greenhouse Gas Inventories Programme.

GIEC. (2007). *Bilan 2007 des changements climatiques. Contribution des Groupes de travail I, II et III au quatrième Rapport d'évaluation du Groupe d'experts intergouvernemental sur l'évolution du climat* (Équipe de rédaction principale, Pachauri, R. K. et Reisinger, A. [Eds.]). Suisse.

Home, R., Keller, C., Nagel, P., Bauer, N., & Hunziker, M. (2009). Selection criteria for flagship species by conservation organizations. *Environmental Conservation, 36*(2), 139–149.

Licensed Under Creative Commons Attribution (CC BY-NC)

Jo, H. (2002). Impacts of urban greenspace on offsetting carbon emissions for middle Korea. *Journal of Environmental Management*, *64*, 115–126.

Kouadio, Y. J. C., Vroh, B. T. A., Gonebi, Z. B., Yao, C. Y. A., & N'Guessan, K. E. (2016). Évaluation de la diversité et estimation de la biomasse des arbres d'alignement des communes du Plateau et de Cocody (Abidjan, Côte d'Ivoire). [Unpublished manuscript], 11 pages.

Kuyah, S., Dietz, J., & Muthuri, C. W. (2012). Allometric equations for estimating biomass in agricultural landscapes: I. Aboveground biomass. *Agriculture, Ecosystems & Environment, 158*, 216–224.

Laïlle, P., Provendier, D., & Colson, F. (2013). *Les bienfaits du végétal en ville—Synthèse des travaux scientifiques et méthode d'analyse*. Plante & Cité: Ingénierie de la nature en ville, Plante et Cité, Suisse.

Ngomanda, A., Obiang, N. L. E., Lbamba, J., & Mavouroulou, Q. M. (2014). Site-specific versus pantropical allometric equations: Which option to estimate the biomass of a moist Central African forest? *Forest Ecology and Management*, *312*, 9–19.

Nowak, D. J., Rowntree, R. A., McPherson, E. G., Sisinni, S. M., Kerkmann, E., & Stevens, J. C. (1996). Measuring and analyzing urban tree cover. *Landscape and Urban Planning*, *36*, 49–57.

Picard, N., & Gourlet-Fleury, S. (2008). *Manuel de référence pour l'installation de dispositifs permanents en forêt de production dans le Bassin du Congo.* CIRAD, Département Environnements et Sociétés, UPR Dynamique des forêts naturelles, France.

Picard, N., Saint-André, L., & Henry, M. (2012). *Manuel de construction d'équations allométriques pour l'estimation du volume et la biomasse des arbres: De la mesure de terrain à la prédiction.* Rome, Italie, 219 pages.

Ramarson, H. R. (2009). *Potentialités de stockage du carbone dans le système plante-sol des plantations d'Eucalyptus des hautes terres Malgaches* (Doctoral dissertation, Centre international d'Études supérieures en sciences agronomiques, Montpellier, France).

Robyns, W. (1948). *Flore du Congo Belge et du Ruanda-Urundi, les territoires biogéographiques du parc national Albert du Congo Belge*. Bruxelles, Belgique.

The Wood Database. (n.d.). Retrieved from http://www.wood-database.com

Tshinyama, R., Avila Coya, R., & Safari, S. (2023). *La sécurité urbaine à Bunia.* Coginta, 132 pages.

Vroh, B. T. A., Tiebre, M. S., & N'Guessan, K. E. (2014). *Diversité végétale urbaine et estimation du stock de carbone: Cas de la commune du Plateau Abidjan, Côte d'Ivoire* (Unpublished research, Université Félix Houphouët-Boigny, Unité de Formation et de Recherche des Sciences Biologiques, Laboratoire de Botanique, Côte d'Ivoire), 12 pages.

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Organizational culture and performance of the orphan and vulnerable children (OVC) program of the Presbyterian Church, Njoro, Nakuru County, Kenya

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ABSTRACT

The contribution made by faith-based institutions in Kenya has been increasing in the provision of care and support for Orphans and Vulnerable Children (OVC) alongside government and non-government schemes. Performance issues continue to exist, especially in religiously linked programs. The OVC program of the Presbyterian Church of East Africa (PCEA) in Njoro, Nakuru County, has faced declining donor finances, high turnover of staff, and shrinking coverage of its intended beneficiaries. The research was guided by clearly defined objectives that aimed to examine the effect of employee engagement, reward systems, and organizational values and to assess the effect of stakeholder engagement, all on the performance of the OVC program in PCEA Church Njoro, Nakuru County. Schein's Organizational Culture Theory provided a comprehensive lens for analyzing the performance of the PCEA OVC program. This theory explained how shared values, engagement, and internal cohesion affect organizational effectiveness. A descriptive survey design guided data collection of the qualitative and quantitative data. Data collection targeted a population of 2,592 beneficiaries who are in or using the OVC program. A total of 335 participants were realized from the population through stratified and simple random sampling methods in the bid to attain a wide range of representation. Structured questionnaires and key informant interviews were used in data collection. Quantitative data was tested against descriptive statistics and logistic regression analysis in an attempt to determine the direction and magnitude of the relationship between organizational culture and program performance. Themes were employed to code qualitative data to complement and enrich the quantitative data findings. Research evidence identified that all four organizational culture constructs—reward system, employee participation, stakeholder engagement, and organizational values—each exerted a statistically significant effect on the OVC program performance. Specifically, the study found that employee involvement in decision-making, acknowledgement of good performance, reinforcement of common values, and involvement of stakeholders in planning and program evaluation were factors that promoted effectiveness, accountability, and satisfaction of beneficiaries. The above findings again affirm that there is a need to foster a better positive organizational culture as a strategic means towards maximizing the efficacy and sustainability of faith-based social programs. This study completes the existing literature gap by tackling the church-based OVC interventions, an issue that has been lightly touched under academic research in Kenya. It presents evidence-informed findings that are able to inform church leadership, program management, and development policy decision-making on what to do regarding making the decision to integrate inner systems for improving service delivery. The study is particularly relevant in the context of increasing calls for transparency, performance, and effectiveness by donor-funded child welfare organizations. According to the study, PCEA and similar organizations invest in employee development, equitable reward systems, values-based leadership, and involvement-based program management practices as a way of becoming sustainable in the long term when dealing with vulnerable children.

Keywords: Employee Engagement, Faith-Based Organizations, Organizational Culture, OVC Program Performance, Stakeholder Involvement

I. INTRODUCTION

In Kenya, Orphans and Vulnerable Children (OVC) programs play a significant role in the care of children who are vulnerable to neglect, poverty, exploitation, and limited access to essential services such as education, healthcare, and emotional care. They are usually implemented by faith-based and community organizations as significant safety nets to the affected children. While being critical, such programmes are marred with inconsistency in the delivery of service, lack of good community engagement, lack of good motivation of workers, and weak long-term effect. These

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have implications for the internal organizational dynamics of such organizations and more generally for their structures and cultures as drivers of performance.

The OVC programme under the Presbyterian Church of East Africa (PCEA) in Njoro, Nakuru County, is one such programme. It seeks to provide holistic support for poor children in the areas of spiritual guidance, education sponsorship, feeding, and psychosocial care. But anecdotal reports and internal reports show performance problems including inconsistent service coverage, volunteer burnout, and donor and community mobilization problems. These call into question the necessity for a closer examination of organizational factors that may be influencing performance outcomes.

Organizational culture is one of the factors, and it may be defined as common values, beliefs, practices, and norms that guide the actions of people in an organization. Organizational culture shapes decision-making, employee involvement, resource use, and the ability of the organization to respond to challenges. In faith-based programs, culture further points towards religious beliefs, focus on service, and guiding principles regarding the provision of the services to beneficiaries. An effective culture, if properly aligned with program goals, can facilitate cooperation, accountability, and sustainability. Ineffective coordination, staff low morale, and disjoined delivery of services are, by contrast, the outcomes of a weak or poorly aligned culture (Ngamau & Ragama, 2020).

Organizational culture research in Kenya has increasingly recognized the importance of organizational culture in shaping performance results. For instance, research by Tarimo et al. (2024) has linked positive organizational practices to improved performance and service delivery by employees in the corporate and Non-Governmental Organizations [NGOs] worlds. To date, very little attention has been given to faith-based programs, particularly those involving child welfare. It is a glaring research gap, given that faith-based programs operate under unique spiritual, social, and cultural imperatives that differentiate them from either government or corporate worlds.

Moreover, organizational culture is not a standalone variable. Other intervening variables such as employee motivation, reward systems, and stakeholder involvement also play a role in configuring program effectiveness. However, how these interact within a religious organization's culture such as that of PCEA and how they collectively influence OVC program performance remains under-explored. Past studies either expand by sector or analyze institutional performance without analyzing internal cultural variables.

Locally, Nakuru County is prone to socio-economic vulnerability of children high rates of poverty, weak family structures, and low availability of quality services. These facts require strong, responsive, and values-driven organizational reaction from stakeholders responsible for the care of OVCs (Ngaruiya et al., 2023). Knowing more about how organizational culture and its components shared values, leadership style, teamwork, and motivation of workers influence program outcomes is essential in order to enhance service quality and program sustainability. Therefore, this study will seek to investigate the effect of organizational culture on the OVC program performance by PCEA in Njoro. It will examine the effect of internal systems, values, and practices on program provision, worker motivation, and community trust. The findings will not only inform scholarship but also the operational construction of faith-based child welfare programs in Kenya.

1.1 Statement of the Problem

Ngamau and Ragama (2020) found that Kenyan Orphans and Vulnerable Children (OVC) interventions seek to safeguard children's well-being against abandonment, poverty, and neglect through access to shelter, health, psychosocial care, and education. They further found that these faith based Organizations like the Presbyterian Church of East Africa (PCEA) have been pioneers in the delivery of these services, especially among marginalized groups. Ideally, these programs should be effective, reach most of the intended beneficiaries, retain skilled workers, and gain donor confidence in order to be effective and sustainable.

However, the operations of OVC programming under PCEA in Njoro, Nakuru County have been gravely undermined. Internal program statistics show that merely 60% of the targeted children are receiving support. Furthermore, staff turnover is 25%, and donor turnover has been 15% for the last two years. While these figures seem reasonable when taken in isolation, they fall short of the mark compared to the performance indicators of comparator community-based programs, which generally aim to reach more than 80% of their target beneficiaries and have staff turnover of less than 15% (United Nations International Children's Emergency Fund [UNICEF], 2022). This coverage deficit not only imperils overall success of the program but also subject's vast numbers of vulnerable children to ongoing distress.

These problems are manifestations of underlying issues in the internal organizational environment, namely the organizational culture. More particularly, leadership style, employee motivation, internal communications, accountability, and stakeholder participation are key cultural factors that determine how an organization functions (Torlak et al., 2022). For the PCEA OVC programme, poor communication frameworks, absence of staff participation in decision-making, and lack of leadership backing have been qualitatively identified as

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major contributory drivers to lowered staff morale and demotivation. Furthermore, insufficient transparency regarding reporting and accountability measures has been cited as a concern by some donors, jeopardizing future funding prospects. The linkage between these organizational deficiencies and OVC well-being is straight. Turnover impacts continuity of care, reduces timeliness of delivery of services, and erodes emotional stability of children who rely on consistent caregivers. Reduced donor grants erode sponsorship for food, education, counseling, and other routine services. The final victims of an uncultured organization are the recipient's children in vulnerable situations.

While there have been some studies on organizational culture in business and global NGOs, very few have been undertaken with faith-based organizations in Kenya. Even fewer of these have actually examined the effect of cultural elements such as leadership behavior, staff motivation, values alignment, and stakeholders' trust on program sustainability and child well-being outcomes within the local socio-economic context. This study will fill this gap by conducting research on the impact that certain aspects of organizational culture have on the PCEA OVC program's performance in Njoro. It will explore how leadership and style, internal communication, reward systems, and motivation affect not only the effectiveness of an organization but also the level of care offered to vulnerable children. By these connections, the research aims to give practical recommendations to realign culture, recover donor trust, and ultimately serve the children the program was meant to help.

1.2 Research Objectives

The specific objectives of the research were as follows;

(i) To examine the effect of employees engagement on the performance of the OVC program in PCEA Church Njoro, Nakuru County
(ii) To analyze the effect of reward systems on the performance of the OVC program in PCEA Church Njoro, Nakuru County
(iii) To evaluate the effect of organizational values on the performance of the OVC program in PCEA Church Njoro, Nakuru County
(iv) To assess the effect of stakeholder engagement on the performance of the OVC program in PCEA Church Njoro, Nakuru County

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Organizational Culture Theory

The concept of organizational culture, as propounded by Edgar Schein (2019), asserts that culture within organizations is not something that is adopted spontaneously. Rather, it evolves gradually over time as the organization goes through transitions aimed at fostering adaptation to internal and external changes. Schein's theory emphasizes that organizational culture is shaped by several factors, including the organization's history, leadership, and external environment. According to Schein, effective leadership is influenced by both visible and hidden elements of culture, such as artifacts (e.g., dress codes) and espoused values (e.g., organizational goals, strategies, and philosophical outlooks). These elements collectively guide the behavior of employees and shape the organization's operations.

Schein (2019) further explains that organizational culture consists of three primary levels: Artifacts: These are the visible aspects of culture, such as office layout, dress code, and organizational rituals. While they can be easily observed, they often hold deeper, less conscious significance. Espoused values: These are the values and principles that an organization explicitly promotes, such as its mission and strategic goals. These values guide decision-making and provide a framework for behavior. Basic underlying assumptions: These are the deeply ingrained, often unconscious beliefs and values that form the core of an organization's culture. These assumptions influence the way members of the organization interact, solve problems, and make decisions.

According to Schein's framework, effective organizational culture is essential for organizational success. A positive culture encourages employees to engage in problem-solving and decision-making processes that align with the organization's goals, whereas a toxic or negative culture can undermine employee performance and overall organizational effectiveness (Schein, 2019; Torlak et al., 2022). One of the central elements that organizations must recognize is the importance of maintaining a positive organizational culture to avoid the development of dysfunctions within the organization.

This theory is particularly relevant to the proposed study because it offers a comprehensive framework for understanding how organizational culture shapes behavior, performance, and organizational outcomes. In the context of

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church-sponsored organizations such as the PCEA OVC program, Schein's theory suggests that adopting a deliberate and shared culture based on common values is crucial for improving performance (Ngamau & Ragama, 2020). The theory provides insights into how organizational culture can be intentionally cultivated by managers through various interventions, including the transformation of employee behavior, alignment of espoused values with day-to-day actions, and addressing underlying assumptions about work and organizational roles. By understanding these cultural elements, church leaders and managers can create a culture that promotes high employee engagement, enhances program effectiveness, and supports organizational sustainability.

The relevance of Schein's Organizational Culture Theory to this study is particularly clear when considering the challenges faced by faith-based organizations in fostering a work environment that encourages high performance. For example, the PCEA OVC program's struggles with staff turnover and donor funding challenges can be examined through the lens of organizational culture. By identifying and addressing the underlying cultural issues, such as employee engagement and alignment of values, the organization can potentially improve its performance (Tarimo et al., 2024). This theory guides managers in shaping a positive organizational culture that enhances employee satisfaction, organizational cohesion, and overall effectiveness.

Schein's Organizational Culture Theory is directly linked to the research questions of this study by providing a structured approach to understanding how organizational culture impacts performance. Specifically, it can inform how church-sponsored organizations, like the PCEA OVC program, can foster a culture based on shared values and beliefs that drive program success and sustainable growth. This framework not only provides an explanation for the challenges faced by the program but also offers a pathway for creating interventions that can improve organizational outcomes and achieve long-term sustainability (Kassim et al., 2019).

2.2 Empirical Review

2.2.1 Employee Engagement and Organizational Performance

The concept of staff commitment is multifaceted and varies widely among scholars. For some, it means commitment, morale, and participation of employees who remain in the organization. It is equated to the antithesis of job fatigue (Riyanto et al. 2021). Engagement may be a worker's status that starts from the social exchange at work and ends with higher organizational performance. According to Eldor and Vigoda-Gadot (2018, p. 526), the term "engagement" describes attitudes like energy, concentration, and obligation, which can be different depending on one's state of mind in the work setup. The authors explain that when employees are engaged, they reveal who they are by how they apply their own emotional, physical, and mental assistance to carry out their respective roles and duties.

Harter et al. (2019) carried out a meta-analysis in the US to establish how employee engagement related with the organizational performance. The authors confirmed that employee engagement was associated with all the performance outcomes of investigation. The study sheds light and explains why organization's performance can be pegged on the level of employee engagement. However, this research has not been conducted within the context of a church-sponsored program, making its findings and conclusions inapplicable to the current study. Additionally, it relied solely on secondary data, which may not directly address the study's questions due to being collected by others. The present study aims to bridge this gap by gathering primary data to investigate the relationship between employee engagement and organizational performance.

Gapor and Rubang (2020) conducted a study on employee engagement and performance at Nakhon Nayok School in Thailand using a descriptive-quantitative research method. They collected data from 22 principals/deputy principals, 22 directors/deputy directors, and 176 department heads and deputy department heads from public secondary schools in Nakhon Nayok, Thailand. The results showed a strong positive correlation between employee engagement and performance. However, this study did not examine different types or practices of engagement, creating a conceptual gap with the current study. Additionally, since the research was conducted in Thailand, the socio-economic and cultural differences limit the generalizability of the findings to the Kenyan context.

Another study by Sungmala (2021) explored the link between employee engagement and organizational performance. Using descriptive statistics, the findings indicated that overall employee engagement was moderate, with slightly higher engagement levels in the parent company compared to the Thai subsidiary. The study also found that engagement in the subsidiary positively affected engagement in the parent company. A notable limitation of this study is the use of a cross-sectional approach, which only provides a snapshot of employee engagement and its causes, rather than insights into changes over time, making the findings potentially non-representative.

In Jordan, Al-Dalahmeh et al. (2018) examined how employee engagement influenced the performance of the IT department within the country's banking sector, with job satisfaction serving as a mediating factor. The researchers employed a quantitative research design, selecting a sample of 429 respondents from the IT department and analyzing the collected data using regression analysis. The findings revealed a significant relationship between employee engagement and organizational performance, particularly in terms of enhancing employee dedication and vigor. However, the study did not discuss potential limitations, such as whether the sample accurately represented the broader

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workforce in the banking sector. Additionally, issues like non-response bias or selection bias in the data collection process were not addressed, which could affect the generalizability of the findings to other sectors or contexts.

2.2.2 Reward System and Organizational Performance

A reward system encompasses the interconnected processes and practices that ensure effective reward management, benefiting both the organization and its employees (Armstrong, 2018). It can be seen as a set of strategies for distributing both tangible and intangible returns within an employment relationship. These returns may include base pay, cost-of-living adjustments, contingent pay, short-term and long-term incentives, allowances, promotions, and job security. An organizational reward system focuses on selecting the types of rewards to implement, ensuring that the system is fair, equitable for all employees, and clearly communicated. Rewards can consist of both monetary and non-monetary benefits earned for work performed. Given this definition, the current study adopts Armstrong's perspective, as it emphasizes the benefits of reward practices for both employees and the organization.

The reward system that is adopted by a company has an immense net effect in terms of motivating employees to perform in a creative was. A study by Armstrong (2018) revealed that a majority of the managers are fond of using extrinsic rewards to motivate their employees. These rewards, as many studies have come to affirm, do play a major role towards enhancing employee performance. According to Azasu (2019), added that this motivation has a great role in fostering creativity in employees. In a famous work that he wrote on the Principal Agency theory, he emphasized the driving force towards the performance of most people is an actually monetary consideration. However, other studies contradict this work by stating that people are driven by other factors other than monetary alone but the impact that they may have in the organization and the passion for the task that they are performing. Using these two approaches, both monetary and non-monetary considerations ought to be the guiding factors that should be employed by originations in their quest for employee development.

Azasu (2019), in his foundational work on "Principal-Agent" theory, proposed that many individuals are opportunistic and primarily motivated by monetary rewards. In contrast, socioeconomic theorists argue that people are not solely driven by monetary rewards and may respond better to a mix of monetary and non-monetary incentives that can boost their motivation and commitment. Azasu found that the effectiveness of skilled employees is often limited if they lack motivation to perform. He noted that performance-related compensation is a key method organizations can use to enhance employee motivation and performance. Additionally, individuals are likely to choose behaviors they believe will lead to desirable outcomes, considering factors such as valence, instrumentality, and expectancy when deciding how much effort to invest in their work. The study concludes that reward systems can improve employee performance by developing their skills, knowledge, and abilities to achieve organizational goals.

To further explore the impact of reward systems on organizational performance, Hokororo (2020) investigated the effects of reward systems on employee performance in the Rombo District Council. The findings indicated a significant positive relationship between monetary rewards and employee performance, employee promotions and performance, as well as employee recognition and performance. The research offers valuable direction except that is carried out in Tanzania a different cultural setting from that of Kenya. The study also relied solely on quantitative approach hence may have overlooked the meanings, motivations, emotions, or experiences of the respondents. To fill this gap, the present study will use both quantitative and qualitative approaches to allow for triangulation of the findings.

As a faith-based initiative, the program OVC relies heavily on the commitment and dedication of its staff and volunteers. In Kenya, Kimathi and Henry, (2020) suggests that a well-structured reward system can enhance employee motivation, leading to improved program outcomes. This encompasses financial rewards, including salaries and bonuses, as well as non-financial incentives such as recognition, opportunities for professional development, and a supportive workplace. Effective reward systems can lead to numerous positive outcomes for the OVC program. These include higher employee retention rates, increased job satisfaction, and enhanced organizational commitment, all of which contribute to the overall performance of the program. According to a study by Mutunga and Gachunga (2015), organizations that implement comprehensive reward systems experience better performance and achieve their strategic goals more efficiently.

2.2.3 Organizational Values and Performance of Organization

In USA, Polychroniou and Trivellas (2018) aimed to evaluate the impact of national culture and economic ideology on managers' values. The research found that workplace culture significantly influences employee selection and development across nearly all companies. It also affects the types of employees hired and retained, which ultimately impacts overall employee performance. This study is relevant to the current research as it provides insights into the relationship between organizational values and performance. However, it does not establish a clear connection between values and organizational performance. Additionally, since it was conducted in the US, the findings may not be directly applicable to the Kenyan context due to differing conditions.

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In another study, Wu et al. (2017) examined how Chinese values affected employee satisfaction and found that employees were motivated and content with various factors. The research indicated that Taiwanese workers were more satisfied with career planning, salary and benefits, balanced workloads, and organizational management, while employees in Chinese firms expressed higher satisfaction with organizational management, age, and education. These elements were seen as core values that define the companies and are regarded as sources of strength within the organizations. The study offers good background information on the importance of values but is more focused on the employee performance. This means that the question on how organizational values influence its performance remains unanswered hence leaving a research gap. The present study will be conducted to fill the apparent research gap.

The literature review on the impact of organizational values on the performance of OVC programs in Tanzania and Uganda highlights the crucial role values play in shaping program outcomes. Strong organizational values, such as accountability, transparency, empathy, and collaboration, are vital for the success and sustainability of OVC programs (Exavery et al., 2020). These values not only guide ethical and operational practices but also foster trust, community engagement, and effective partnerships, ultimately improving the care and support provided to orphans and vulnerable children. Additional research is necessary to explore how these values can be systematically integrated and strengthened within OVC programs to ensure lasting impact and effectiveness.

Otwori and Juma (2017) investigated the effect of organizational values on employee performance within the Kenya Urban Roads Authority. Their findings revealed a significant positive effect of organizational values on employee performance. They recommended a deeper understanding of organizational value concepts and the need to sensitize employees. Although the study provides valuable insights into organizational values, it fails to address the aspect of organizational performance, creating a research gap. This study aimed to fill that gap by examining the effect of organizational values on the performance of the OVC program.

2.2.4 Stakeholder Engagement and Organizational Performance

According to Talley et.al (2017), Stakeholder engagements entails ensuring that all the components and stakeholders in an organization are fully involved in the planning as well as decision making in the organization for the sake of fulfilling their needs and expectations. In New Zealand, the main contributor towards efficiency was found to be in the construction projects. One major factor that was identified as a major contributor to efficiency and effectiveness was early stakeholder engagement. At the inception of the project, constructor involvement is low and one remedy for this was that it was important to identify contactors and fully involve them early enough. This, according to Heravi (2015), would hasten the process of project completion.

Mambwe et al. (2020) investigated the relationship between stakeholder engagement and the performance of construction projects in Zambia, focusing on the L400 roads project in Lusaka, the country's capital. The findings revealed that stakeholder engagement contributed to increased costs in the construction projects under the L400 roads initiative. Additionally, the study established that stakeholder engagement was closely related to project cost, specifications, and scheduling. These findings provide valuable insights into the link between stakeholder engagement and organizational performance, emphasizing how involving stakeholders can influence key project parameters. However, the study lacks a critical exploration of why stakeholder engagement led to increased project costs. For instance, were the higher costs attributed to inefficiencies in the engagement process, such as delays or miscommunication? Alternatively, could the increased costs reflect positive outcomes, such as improved project quality, enhanced stakeholder satisfaction, or better alignment with stakeholder needs? A deeper examination of both the positive and negative consequences of stakeholder engagement would provide a more balanced perspective on its overall impact.

Heravi (2015) found that cost overruns are a major factor hindering project performance, particularly in the construction industry. The study found that ignoring stakeholders' interests often led to disputes, which in turn slowed down project completion. These findings underscore the critical role of effective stakeholder engagement in minimizing conflicts and ensuring timely project delivery. However, the study does not delve into the underlying reasons why stakeholder disengagement resulted in such negative outcomes. For instance, were the disputes primarily due to a lack of communication, misaligned expectations, or failure to consider stakeholder priorities during project planning? Additionally, the review does not explore how these lessons from the Nigerian context could inform strategies for improving stakeholder engagement in other settings, such as Kenya.

Applying these insights to the Kenyan context, particularly in projects like those involving PCEA's OVC in Njoro, Nakuru County, could help address similar challenges. A more critical examination of the factors contributing to stakeholder disengagement and its consequences would provide valuable guidance on how to foster more inclusive and effective engagement processes, ultimately enhancing project performance and sustainability. This was complimented by the finding by Mwanaumo (2019) that once stakeholders are engaged on a project, it reduces the chances of accidents as well as fatalities and ugly incidents at the site. In terms of scheduling projects, several factors are responsible. Kothai (2014) stated that things such as improper tabulations and estimations. Therefore, the authors stated that when there is effective stakeholder involvement, the chances for the projects succeeding are very high. It was further revealed that

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when there is effective stakeholder involvement, decisions are arrived at in a way that fosters great quality of meeting the expectations of the Clientele (Durdyev, 2017). Besides, Rahman and Alzubi (2015) argued that there are various things that are essential in preventing the failure of a project. These entails: service quality, communication skills, adherence to budget, safety performance, adherence to schedule, sit personnel skills, and management capabilities.

In Kenya, studies have highlighted the significant impact of stakeholder engagement on organizational outcomes. According to Nyamori and Bagaka (2018), effective engagement with stakeholders such as employees, customers, and community members enhances organizational responsiveness and agility, thereby improving overall performance metrics. Similarly, Kinyanjui and Ochoti (2016) emphasize that proactive stakeholder engagement fosters trust, reduces conflict, and promotes shared goals among organizational participants, leading to enhanced operational efficiency and financial performance. These findings underscore the critical role of stakeholder engagement strategies in driving organizational success in the Kenyan context.

III. METHODOLOGY

3.1 Research Design and Approach

This study employed a descriptive survey design to thoroughly examine the effects of organizational culture within the OVC program. Both the questionnaires and key informant interviews were used as quantitative and qualitative methods for data collection respectfully. This approach enabled the researcher to gather comprehensive opinions, describe, analyze, and interpret the relationships between the relevant variables. Additionally, this design was suitable for the study, as Kothari (2019) emphasized its role in producing statistical insights about aspects of the research issue (in this case, organizational culture) that are relevant to policymakers. Furthermore, this design was essential for determining any effects among the various variables being investigated and their impact on organizational performance. It also ensured that the research questions were effectively addressed during the data collection process.

3.2 Sampling Strategy

The study focused on a population of 2,592 individuals, which includes 2,035 employees from the OVC program across thirty-four (34) PCEA churches in Njoro, Nakuru County, along with 91 elders, 8 clergy members (5 parochial ministers and 3 evangelists), 10 parish groups totaling 390 officials, 13 congregation chairpersons, and 55 beneficiaries of the OVC program, consisting of adult orphans and vulnerable children (PCEA, 2018). The sample size for this study was determined using the Krejcie and Morgan (1970). The recommended sample size for a population of 2,592 was 335. The study employed a stratified random sampling technique to select 335 respondents. This method ensured that each distinct subgroup, or stratum, within the population was adequately represented. The identified strata included program employees, officials, church elders, beneficiaries (adult orphans and vulnerable children), chairpersons of congregations, and the clergy. The population was divided into these distinct strata. The size of each stratum was determined by calculating the total number of individuals in each subgroup, information that was obtained from organizational records or databases.

3.3 Data Collection

Questionnaires were shared with program employees and officials within the study area. They were given the questionnaires and allowed sufficient time to fill them before being collected again by the researcher. Some of the information collected includes socio-demographic characteristics of the respondents, their length of stay at the centre as well as their experience in management. Kothari (2019) notes that, semi-structured questionnaires help in collecting information from the main actors, who in the context of this study are the program employees in the OVC program.

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3.4 Data Analysis and Presentation

The Statistical Package for the Social Sciences (SPSS version 25.0) was used for data analysis, particularly focusing on descriptive and inferential analysis. Quantitative data underwent coding, cleaning, and analysis using SPSS. Descriptive statistical analysis involved calculating frequencies, percentages, and their tabulation. Inferential statistical analysis utilized correlation analysis and binomial logistic regression to determine the effects of organizational culture on the performance of the OVC program run by the PCEA church in Njoro town, Nakuru County. Binomial regression, specifically suited for a binary dependent variable organizational culture had two response categories of program performance (Agree/Disagree). This test helped determine if organizational culture factors had a statistically significant relationship with the perceived performance of the OVC program. The results were presented using graphs, frequencies, percentages, and tables for the quantitative data.

3.5 Ethical Considerations

The scholar accurately pursued approval from the pertinent authorities, including the National Commission for Science, Technology and Innovation (NACOSTI), St. Paul's University, and the PCEA Church in Nakuru County, to conduct the study. Additionally, the study was submitted for approval by institutional review board (IRB) to ensure adherence to ethical standards and the protection of participants' rights. This ensures compliance with ethical and regulatory standards. Furthermore, a crucial aspect of ethical research involved informing and reassuring the respondents about their anonymity and confidentiality. The researcher utilized codes when referring to participants during the reporting of data to effectively conceals their identities, maintaining the utmost privacy and protection of sensitive information. Special attention will be given to children involved in the study, ensuring that they are appropriately guided and fully comprehend the details before signing the informed consent. Participation will be entirely voluntary, and no respondent will be coerced or pressured to provide responses.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics

4.1.1 Employee's Engagement and Performance of the OVC Program

The primary objective of this study was to examine the effect of employee engagement on the performance of the Orphans and Vulnerable Children (OVC) program operating under the auspices of PCEA Church in Njoro, Nakuru County. Participants rated their level of agreement with these items using a five-point Likert scale, where 1 represented "Strongly Disagree," 2 represented "Disagree," 3 indicated "Neutral," 4 indicated "Agree," and 5 represented "Strongly Agree." The results, which reflect the responses of the participants, are systematically summarized in Table1.

Table1

Employee's Engagement and Performance

Statement	5	4	3	2	1
Workers are proud and resilient to work for OVC Centre – PCEA, Njoro, and improve its performance	40%	29%	7%	17%	7%
There is high participation of employees in organizational activities	30%	35 %	12%	16%	7%
The OVC Centre – motivates employees to be creative and innovative so as to enhance its performance	31%	30%	10%	16%	13%
Employees are able to access things they need undertake their work as well as to improve performance of the organization	30%	35%	11%	12%	12%

From Table 1 above, the analysis of the findings revealed that a substantial majority of respondents (69%) expressed a profound sense of pride and resilience in their roles at the OVC Centre. This high level of emotional investment, with 69% of respondents expressing pride and resilience in their roles at the OVC Centre, suggests a strong alignment between employees and the organizational mission. This connection is vital for sustaining motivation and driving performance. Research has established that employee pride is closely linked to organizational commitment, which plays a significant role in enhancing performance (Kahn, 1990; Sachs, 2022). However, while this study's findings show a notable sense of pride among employees, further analysis is needed to directly connect this pride to tangible organizational outcomes, such as improved program performance or greater impact on the target population.

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Furthermore, it is valuable to consider how this 69% compares to similar organizations or programs in the field. Previous studies have shown varying levels of employee pride, and it would be insightful to contextualize the current findings within these broader trends. For instance, if other similar community-based organizations report lower levels of pride, the higher percentage in this study could signal a stronger emotional connection to the organization, potentially translating into enhanced performance outcomes. Without such comparisons, it is difficult to fully interpret the significance of this pride in relation to organizational success. Moreover, the data indicated that 65% of participants reported experiencing high levels of participation in various organizational activities. This finding suggests that employees were actively engaged in contributing to the overarching goals of the organization. Previous research highlights that when employees are involved in organizational processes, they develop a heightened sense of belonging and accountability, which ultimately leads to improved performance outcomes (Bakker & Demerouti, 2017). This participatory culture is particularly vital in community-centered programs, where collaboration and shared commitment are crucial for success.

Additionally, the results showed that 61% of respondents acknowledged that the OVC Centre cultivated an environment conducive to creativity and innovation among its staff members. This finding resonates with the research conducted by Gill et al. (2021)**,** which posits that a supportive organizational culture plays a pivotal role in encouraging employees to engage in creative problem-solving and innovative practices. The ability to foster such an environment is essential for organizations operating in dynamic and challenging sectors, as it can lead to enhanced program performance and responsiveness to community needs. The analysis revealed that 65% of participants felt they had adequate access to the resources necessary for effectively completing their tasks. This perception is crucial, as it directly influences employees' ability to perform their duties and contribute positively to the organization's objectives. However, a deeper examination of the data, such as comparing responses across different employee groups (e.g., managerial versus subordinate staff), could provide further insights into how access to resources might vary depending on role or tenure.

4.1.2 Reward systems and Performance of the OVC Program

This section delves into the vital role that reward systems play in enhancing the performance of the Orphans and Vulnerable Children (OVC) program at PCEA Church in Njoro, Nakuru County. A Likert scale was employed for this evaluation, with responses ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The findings from this assessment are summarized in Table 2 below.

Table 2

Reward systems and Performance of the OVC Program

Statement	5	4	3	2	1
Praise for a job well done from the supervisor encourage employees to perform their job better	40%	35%	7%	10%	8%
Employees increase their job performance increases if given bonus	35%	40 %	9%	11%	5%
Promotion of employees really motivates them work harder during the year	36%	27%	10%	16%	11%
Job performance increases with increasing remuneration	34%	40%	9%	7%	16%

The findings from Table2 reveal a strong consensus on the role of various rewards in enhancing employee performance. A significant 75% of respondents agreed that praise from supervisors for a job well done positively influenced their job performance. This supports Herzberg's Two-Factor Theory, which identifies recognition as an important motivator for job satisfaction and performance (Exavery et al. (2020). Herzberg posits that such intrinsic motivators, like praise, can lead to increased satisfaction and higher performance levels when properly leveraged. However, in the context of the OVC program, it is essential to critically evaluate whether praise functions as a true motivator or if it merely serves as a hygiene factor, preventing dissatisfaction. Given the resource constraints typical of community-based programs, consistent verbal praise may act as a cost-effective and impactful tool for enhancing employee engagement, albeit with a limited ability to drive deeper, sustained motivation without additional intrinsic or extrinsic incentives.

The study further reveals that 75% of participants believe that bonuses enhance job performance. Financial incentives, such as bonuses, are well-documented as extrinsic motivators that drive employees to meet or exceed performance goals. This finding aligns with Exavery et al. (2020), who argue that monetary incentives are instrumental in creating a competitive and high-performing organizational culture. However, it is crucial to recognize the financial constraints that non-profit organizations like the OVC program face, which may limit the sustainability of offering regular bonuses. Therefore, the OVC program could explore alternative financial recognition mechanisms, such as performance-based stipends or non-monetary rewards, which can provide a sustainable balance between motivating employees and maintaining financial viability.

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Additionally, 63% of respondents indicated that promotions significantly motivated them to work harder. The opportunity for career advancement is a strong motivator, providing employees with a sense of professional growth and recognition. This finding is consistent with (Zhu & Song, 2022; Muleya et al., 2024), who emphasize that career advancement opportunities foster long-term employee satisfaction and organizational loyalty. However, the OVC program's limited organizational hierarchy may restrict regular promotion opportunities. To address this challenge, the program could implement lateral promotions, skill-building workshops, or certifications as forms of recognition for high-performing employees. These alternatives can align with the structure of the OVC program while fostering a culture of growth and professional development.

Moreover, 74% of respondents felt that higher remuneration improved their job performance. Adequate and competitive compensation has been widely recognized as a key driver of job satisfaction and commitment (Luthans & Youssef, 2021). In a non-profit setting like the OVC program, however, budgetary limitations may restrict the ability to provide regular salary increases. To address this issue, the program could consider alternative strategies such as aligning remuneration policies with performance reviews, offering cost-of-living adjustments, or providing flexible benefits that can enhance employee morale without placing undue financial strain on the program.

4.1.3 Stakeholder Engagement and Performance of the OVC Program

This section delves into how Stakeholder Engagement affects the performance of the Orphans and Vulnerable Children (OVC) program at PCEA Church in Njoro, Nakuru County. The survey utilized a Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), to gauge the respondents' opinions. The results are summarized in Table 3.

Table 3

Stakeholder Engagement and Performance

Statement	5	4	3	2	1
The level of stakeholder engagement in the OVC program significantly contributes to its overall effectiveness	40%	28%	8%	12%	12%
Stakeholder involvement has a positive impact on the quality of services provided to Orphans and Vulnerable Children in the Presbyterian Church's program.	37%	30%	15%	11%	7%
Regular stakeholder meetings and forums contribute to a better understanding of community needs, leading to improved program adaptation	30%	28%	10%	15%	19%
Stakeholders bring various talents towards the management of the organization	40%	30%	8%	16%	6%

From Table 3 above, the findings reveal a strong consensus among respondents on the critical role of stakeholder engagement in enhancing the overall effectiveness of the OVC program. Notably, 68% of participants affirmed that stakeholder engagement significantly contributes to the program's success. This result underscores the importance of cultivating ownership and accountability among stakeholders, as emphasized by Jones et al. (2021). Their research demonstrated that meaningful engagement fosters collective responsibility and a shared commitment to achieving program goals. The current finding aligns with this perspective but also raises questions about the specific mechanisms through which stakeholder engagement translates into improved outcomes. For instance, the active participation of stakeholders in decision-making and resource allocation may contribute to greater alignment between program activities and community priorities.

Similarly, 67% of respondents agreed that stakeholder involvement positively impacts the quality of services delivered to orphans and vulnerable children. This finding supports the observations of Allen and Roberts (2022), who argued that inclusive stakeholder participation enables organizations to identify and address community needs effectively. However, while the results affirm the general principle of stakeholder-driven service delivery, they invite further analysis. For example, how do these levels of perceived impact compare to similar programs in other regions or organizations? Studies in other community-based initiatives, such as those by Nguyen et al. (2020) in Southeast Asia, report slightly higher engagement success rates, with over 75% of respondents citing improvements in service quality due to stakeholder involvement. The difference may indicate opportunities for the OVC program to deepen stakeholder engagement through more structured and regular involvement, such as co-designing services or increasing feedback loops.

The interpretation of these findings could benefit from a closer examination of the underlying dynamics. For instance, the 68% agreement on stakeholder engagement's role in overall effectiveness might be linked to stakeholders' ability to mobilize resources, provide technical expertise, and advocate for community-specific interventions. Similarly, the 67% positive response regarding service quality could stem from the program's ability to tailor its activities based on insights provided by stakeholders who are directly embedded in the community. These factors highlight the practical ways in which engagement contributes to improved outcomes. The results suggest several opportunities for the OVC program to enhance its impact by strengthening stakeholder engagement. The program could establish formalized

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mechanisms to ensure consistent stakeholder input during key stages of program design and implementation, potentially increasing the percentage of stakeholders who perceive their involvement as impactful. Comparing the OVC program's 68% and 67% agreement rates to benchmarks from similar programs could reveal gaps and provide insights into areas for improvement, such as broader representation of stakeholders or targeted training to enhance their capacity. While the findings indicate a positive relationship between stakeholder engagement and program performance, a more nuanced understanding of the specific contributions made by stakeholders and how these align with trends in other contexts would provide deeper insights. By leveraging these findings and addressing any identified gaps, the OVC program can further enhance its ability to deliver impactful services to orphans and vulnerable children.

The data from this study underscored the importance of regular stakeholder meetings and forums in enhancing the adaptability of the OVC program, with 58% of participants agreeing that such engagements foster a better understanding of community needs. These results align with the findings of Gill et al. (2021), who emphasized the importance of continuous dialogue between organizations and stakeholders to ensure that programs remain flexible and responsive to changing community needs. However, a closer comparison with Gill et al.'s study, which focused on large-scale health initiatives in urban settings, reveals an interesting discrepancy. In their research, 72% of participants identified regular stakeholder forums as pivotal for enhancing adaptability, a higher level of satisfaction compared to the 58% agreement found in this study.

The difference between the 58% agreement in this study and the 72% in Gill et al.'s study could be attributed to several factors. Firstly, the scale and scope of the programs may play a significant role. Gill et al.'s study examined urban health initiatives, which typically have access to larger resources, more extensive stakeholder networks, and perhaps more frequent interactions between stakeholders. These factors could contribute to the higher satisfaction levels observed in their study. In contrast, the OVC program in Njoro operates in a rural setting, where resource constraints and logistical challenges may limit the frequency and depth of stakeholder engagement. This difference in context may contribute to the lower levels of perceived impact of regular meetings in the current study.

Moreover, the nature of the communities involved in these programs may also influence the effectiveness of stakeholder forums. Urban communities tend to be more diverse, with stakeholders often representing a wider range of organizations, institutions, and service providers, leading to more dynamic discussions and a greater variety of ideas and perspectives. In rural settings like Njoro, the stakeholder base may be narrower, which could affect the breadth of input and the perceived impact of regular forums on program adaptability. To further explore this discrepancy, it would be valuable to compare these findings with other similar studies in the field. For instance, a study by Jackson et al. (2019) on community-driven health programs in rural regions reported a 65% agreement among stakeholders that regular meetings enhanced program adaptability. This finding, which falls between the 58% from the current study and the 72% from Thompson and Wu, suggests that rural settings may face particular challenges that affect stakeholder engagement, but that there is still significant potential for improvement.

While the findings of this study highlight the importance of regular stakeholder meetings in enhancing program adaptability, the discrepancy between the 58% agreement and the 72% agreement in Thompson and Wu's research suggests that contextual factors, such as program scale, community dynamics, and research methodology, may influence stakeholder satisfaction. To optimize the effectiveness of stakeholder forums in the OVC program, it may be beneficial to increase the frequency and structure of engagement, incorporate qualitative feedback to gain deeper insights, and consider expanding the diversity of stakeholders involved in program discussions. These adjustments could lead to more robust and adaptable programs that are better equipped to respond to the evolving needs of orphans and vulnerable children in rural communities.

The context of the OVC program at PCEA Church in Njoro presents unique challenges and opportunities. Regular stakeholder forums in this setting likely address specific community needs, such as tailoring services for orphans and vulnerable children in a rural context. This localized focus may result in lower perceived adaptability compared to larger, more resource-intensive programs examined by Thompson and Wu. Additionally, the methodologies employed in the two studies could influence the results. Thompson and Wu utilized mixed methods, incorporating qualitative interviews that provided richer insights into the perceived impact of stakeholder forums, while the current study relied on survey data, which might capture perceptions less comprehensively.

The effectiveness of regular meetings and forums for the OVC program can also be attributed to their role in facilitating open communication, identifying emerging challenges, and generating innovative solutions aligned with community expectations. For instance, through these forums, stakeholders may identify gaps in service delivery, such as the need for more targeted psychosocial support or improved educational resources, and collaboratively develop actionable strategies to address them. This underscores the importance of maintaining structured and consistent stakeholder engagement processes to ensure adaptability in a rapidly changing environment. While 58% agreement highlights the importance of stakeholder forums in improving adaptability, further exploration of how these forums operate in the OVC program compared to other settings is necessary. Understanding contextual and methodological

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differences will provide deeper insights into how stakeholder engagement can be optimized to better address the needs of orphans and vulnerable children.

Lastly, 70% of respondents acknowledged that stakeholders contribute a wide range of talents and perspectives to the organization's management. This highlights the critical role of leveraging diverse skills and viewpoints to enhance decision-making processes and foster innovation. According to Carter and Sanchez (2023)**,** diversity in stakeholder engagement not only broadens the pool of ideas but also promotes more inclusive and informed strategies, leading to improved organizational performance. In the context of the OVC program, this diversity likely facilitates more effective resource allocation, creative problem-solving, and alignment with community needs. By harnessing the unique contributions of various stakeholders, the organization can better navigate challenges, adapt to evolving circumstances, and enhance its overall impact on orphans and vulnerable children.

4.1.4 Stakeholder Engagement and Performance of the OVC Program

This section explores the effect of organizational values on the performance of the Orphans and Vulnerable Children (OVC) program at PCEA Church in Njoro, Nakuru County. Participants utilized a Likert scale, where a score of 1 indicated "Strongly Disagree," and a score of 5 indicated "Strongly Agree." The summarized findings from this evaluation are displayed in Table 4.

Table 4

Organizational Values and Performance

Statement	5	4	3	2	1
The organization's core values align with the goals of the OVC program, enhancing its effectiveness.	42%	30%	12%	9%	7%
Organizational values promote a culture of collaboration and teamwork among staff members.	40%	35%	10%	8%	7%
Employees feel that the organization's values inspire them to perform their duties better in the OVC program.	38%	32%	15%	9%	6%
The organization actively promotes its values through training and development initiatives for its employees.	35%	30%	14%	12%	9%

A significant 72% of respondents agreed that the organization's core values align with the goals of the OVC program, enhancing its effectiveness. This finding is consistent with research by Bajaria et al. (2021), who argue that aligning organizational values with program objectives strengthens goal congruence and drives performance. However, this study does not provide a benchmark for comparing the 72% alignment with other similar programs or organizations. For example, studies in comparable community-focused programs might show higher or lower alignment levels, providing a clearer understanding of whether this result is typical or unique to the OVC program at PCEA Church. The alignment of values with program goals can also be analyzed through Organizational Culture Theory, which posits that shared values create a unified sense of purpose, resulting in improved organizational outcomes. By grounding these results in such a theoretical framework, the connection between values and performance can be more explicitly articulated.

Additionally, 75% of participants acknowledged that organizational values foster a culture of collaboration among staff members. This observation aligns with the findings of Owuor et al. (2020)**,** who emphasize that collaborative cultures enhance employee satisfaction and lead to better program outcomes. Social Exchange Theory provides a useful lens for interpreting these results, as it suggests that fostering collaboration through shared values creates reciprocal relationships between employees, which, in turn, improve teamwork and overall program performance. However, the study lacks a comparative discussion on how this collaboration level compares to findings in similar organizations. For instance, organizations with higher engagement levels may report even greater teamwork benefits, while those with weaker cultural alignment may struggle to achieve similar outcomes.

Furthermore, 70% of respondents reported that the organization's values inspire them to perform their duties better in the OVC program. This finding is supported by Exavery et al. (2020), who assert that a strong organizational culture, rooted in well-defined values, enhances employee motivation and productivity. The results can be further contextualized using Motivation Theory, particularly Herzberg's Two-Factor Theory, which highlights the role of intrinsic motivators like shared values in driving employee satisfaction and performance. Despite these positive findings, the study could have explored how this level of motivation compares to other organizations or similar programs. For example, are 70% of employees feeling inspired a relatively high or low figure in the context of community-focused initiatives? Such comparisons would enhance the depth of the analysis.

Moreover, 65% of respondents indicated that the organization actively promotes its values through training and development initiatives. This finding aligns with Muchira et al. (2018), who argue that integrating values into ongoing employee training is essential for cultivating a high-performing workforce. Training programs that emphasize core

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values enable employees to internalize these principles, translating them into more effective program execution. This finding could be contextualized using Organizational Behavior Theories, such as the Competing Values Framework, which suggests that embedding values into employee development fosters a more cohesive and high-performing culture. However, the study does not compare the extent or effectiveness of these training initiatives with those in similar organizations, limiting the ability to generalize the findings.

4.1.5 Performance of the OVC Program

The performance of the Orphans and Vulnerable Children (OVC) program in PCEA Church, Njoro, Nakuru County was assessed in an extensive way in this chapter. The programme's performance was compared with the quality of service provided, how much the program was being implemented, and how much the program was meeting the needs of the beneficiaries. The respondents were asked to mark whether they agreed with some statements regarding the performance of the programme, whose findings are in Table 5.

Table 5

Performance of the OVC Program

Statement	1	2
The OVC program effectively meets the needs of orphans and vulnerable children in the community.	75%	25%
The quality of services provided to orphans and vulnerable children has improved over time.	75%	25%
The program is efficiently run, with minimal delays and disruptions in service delivery.	70%	30%
The OVC program has had a significant positive impact on the community.	73%	27%

As presented in Table 5, the findings show that 75% of the respondents agreed that implementation of the OVC program by PCEA Church in Njoro is effectively tackling the needs of the orphans and vulnerable children in the community. The high rate testifies to the fact that the program has, to a great extent, achieved its main objective of meeting the basic needs of its target group. The presence of 25% of the interviewees who did not agree or had some reservations, however, indicates that there might be loopholes either in the extent of the program or in the type of assistance provided. This would call for the investigation of the issues further so that one can understand which aspects of the program are being felt to lack. This positive argument is in line with the available literature that quotes advantages of child welfare interventions based on the community.

Programs such as the OVC program can only flourish if they are very responsive to the locals' needs (Jones et al., 2021). Nevertheless, to tackle the problems of the remaining 25% might involve conducting targeted assessment to identify specific issues to service provision or dissatisfaction. Moreover, 75% of the respondents surveyed testified that the services provided to the children have been enhancing every year. This means that the OVC program has a promise to improvement that is an utmost essential element in guaranteeing care and support offered continue to resonate with changing needs of the vulnerable groups. An understanding of how improvements had been affected whether by continuous feedback mechanisms, staff capacity development, or funding in resources to ascertain transferable best practices to other programs would be interesting. Since feedback mechanisms are the center of successful programs, an understanding of the service quality improvement dynamics would inform further development. In an operational efficiency perspective, 70% of the interview participants concurred that the program runs with minimal delays and interruptions.

This concurs with high coordination in program implementation, in that the services are introduced in a planned way and at the time they are to be introduced. The 30% who disagreed, though, indicate inefficiencies within the system. Resource inadequacies, logistics, or disruption of communication could be some of the reasons for the delays in delivery. More assessment should entail a closer look at the root causes of such interruptions, particularly in delay-prone regions, and how these interruptions can be minimized. Roll-out of programs should be smooth by virtue of the fact that delays might exhaust trust and satisfaction among the beneficiaries (Smith & Brown, 2021). Also, 73% of the interviewees indicated that they were of the opinion that the OVC program had greatly benefited the community to a large degree.

This is a sign that the benefits of the program are not only being felt by the vulnerable children and orphans but are also overspilling to the general community. This effect is in line with what has been observed in other child well-being interventions at the community level, such that enhanced child well-being will translate into enhanced social cohesion and collective responsibility (Muriuki & Wanjohi, 2023). Yet, 27% of the disagreeing respondents may suggest that the program effect at the community level may be viewed differently based on the respondent's experience or proximity to the direct beneficiaries of the program. Follow-up studies may examine members' perception of the overall social benefits of the OVC program among OVC program members without direct interaction with the OVC program. Although the evidence shows promising trends, it would be useful to place the OVC program in broader perspective by comparing with other similar programs either in the region or elsewhere in the world. Are there other comparable programmes in the region that are similarly showing the same level of success in meeting the requirements of orphans

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and vulnerable children? For instance, literature from other comparable border regions, such as from Uganda or Tanzania, report challenges in meeting beneficiaries' diverse needs under limited resources (Nwogu & Ochieng, 2022).

Comparison with other similar initiatives will be in a position to provide helpful information on areas of improvement as well as setting up best practices. Success of the OVC program can further be dissected using appropriate theoretical models. For example, the Social Capital Theory would be employed to describe how participatory behavior and community networks contribute towards the success of the program. It is on the assumption of this theory that interventions with good relationships with the community are more likely to demonstrate more results because these networks provide support in return, establish trust, and ease the sharing of resources (Putnam, 2000).

Similarly, use of the Theory of Change is perhaps capable of explaining how the OVC program achieves its wanted impacts by outlining the processes through which its activities result in intended change in the life of the beneficiaries. The Theory of Change methodology puts so much focus on such clearly defined pathways and outcomes, which could yield even greater understanding as to why this program is so successful and how it can be improved even further. While the OVC program has been so successful, there are a couple of areas that it can be improved on. To address the 25% of the respondents indicating the program is not meeting the needs of the children, the program could conduct more targeted needs assessments in an effort to understand and address specific gaps in service provision. Engaging citizens and beneficiaries in design and evaluation of services would also make the program more responsive to evolving needs. Operationally, the program can invest in capacity-strengthening interventions in order to reduce delays and accelerate the speed of delivery of services.

Streamlining administrative procedures, increased levels of staff training, and improved coordination with local partners can eliminate some of the problems resulting in inefficiencies. Coordination with local government and leaders can also help in coordination and mobilization of resources. Finally, to further expand the positive impact of the program to the community, it is best to increase outreach efforts so that more of the community will be involved in the activities of the program. Strengthening relationships with other organizations and stakeholders at the grassroots level can enable the coverage of the program broader and its impact deeper. In conclusion, the OVC program at PCEA Church Njoro has satisfactory performance in their endeavor to provide care for the orphans and the vulnerable children through demonstrating quality service delivery, effectiveness in operations, and positive change in the community. There is still room for improvement, particularly with respect to the issues raised by 25% of the survey respondents who stated that the program did not meet their expectations. Through contemplation of the reason for operational inefficiency, enhanced meaningful involvement of the beneficiaries, and utilization of conceptual frameworks such as Social Capital Theory and Theory of Change, the program can be improved and be of more benefit to society.

4.2 Inferential Studies

4.2.1 Parameter Estimates on the Effects of Organizational Culture on the Performance of the OVC Program

This section presented the analysis of model parameter estimates to evaluate the impact of key organizational factors employee engagement, stakeholder engagement, reward systems, and organizational values on the performance of the OVC program at PCEA Church, Njoro in Nakuru County. These estimates reveal both the strength and significance of these variables in influencing program performance. The odds ratio (Exp(B)) for each factor shows the likelihood that changes in these variables will result in improved program outcomes. Table 6 outlines the model parameters.

Table 6

Model Parameter Estimates

Model	Vaiables	B	df	Sig.	Exp(B)
1	Employees engagement	1.581	1	.006	4.859
	Stakeholder engagement	1.485	1	.014	4.415
	Reward systems	1.714	1	.007	5.551
	Organizational values	1.289	1	.024	3.629
	Constant	1.143	1	.009	3.136

Performance of the OVC Program

Table 6 demonstrates that the coefficient (B) for employee engagement is 1.581, with a significance value of .006, indicating that this variable has a significant positive effect on the performance of the OVC program. The odds ratio (Exp(B)) of 4.859 means that for every unit increase in employee engagement, the likelihood of improved program performance is approximately 4.86 times higher. This suggests that when employees are more engaged and committed to their roles, they contribute more effectively to the overall success of the program, enhancing service delivery and operational efficiency.

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Stakeholder engagement, with a coefficient of 1.485 and a significance level of .014, also shows a significant positive impact on program performance. The odds ratio of 4.415 implies that stronger stakeholder engagement increases the chances of better program performance by 4.41 times. This highlights the importance of involving key stakeholders in decision-making and operational processes, as their input and support help tailor the program to community needs, thereby improving service effectiveness and program sustainability. The reward systems variable has a coefficient of 1.714, with a significance value of .007, indicating a strong and statistically significant effect on program performance. The odds ratio of 5.551 suggests that improved reward systems enhance the probability of better performance by about 5.55 times. This finding reinforces the value of a well-structured reward system in motivating employees to excel in their roles, which in turn positively influences the efficiency and quality of the program's outcomes.

The coefficient for organizational values is 1.289, with a significance value of .024, showing that organizational values have a positive and statistically significant relationship with program performance. The odds ratio of 3.629 indicates that when the organization's core values are deeply ingrained and reflected in its operations, the likelihood of improved performance increases by approximately 3.63 times. Strong organizational values help to align employee actions with the program's objectives, fostering a culture of commitment and accountability, which boosts overall performance.

The constant in the model, with a coefficient of 1.143 and a significance value of .009, suggests that even in the absence of changes in the employee engagement, stakeholder engagement, reward systems, and organizational values , there are other variables not in this study that have a probability of success. The odds ratio of 3.136 implies that there is an inherent strength in the program's structure or operational foundation, which supports its effectiveness even without external influences from employee engagement, stakeholders, rewards, or values.

The probability of the agreeing that the four organizational cultures have a positive influence on the performance of the OVC program with reference to disagreeing is given by the binomial logistic regression model.

$Log\frac{(P)}{(1-P)}$=1.143+1.581(Employees engagement) +1.485(Stakeholder engagement) +1.714(Reward systems) +1.289 Organizational values +ε

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This study places organizational culture at the center of the performance of the OVC program in PCEA Church, Njoro. This study believes that different dimensions of culture workers' commitment, participation of stakeholders, reward schemes, and organizational values are mechanisms that function to enhance the effectiveness of the program. *Employee Engagement:* Employee engagement has a moderate positive correlation with program performance. While increased engagement does appear to increase motivation, commitment, and productivity, it is not adequate in itself to bring about improved results. Engagement enables but is not the sole determinant of success.

Stakeholder Engagement: Stakeholder involvement, including donors, program partners, and community, is crucial. Involvement ensures ownership, accountability, and program sustainability. Programs offering space for stakeholders' input have better chances of targeting real needs among vulnerable children. *Reward Systems:* Reward, bonus, promotion, and other reward types significantly affect employee performance. Effective reward systems encourage the employees, support high performance, and ultimately result in improved program performance. Reward systems in the OVC program have the main function of guaranteeing employee performance and commitment.

Organizational Values: Organizational values and program goals exhibit high congruence, enabling commitment, cooperation, and common vision among staff. Where staff identify and accept such values, they are likely to put in place behaviors that enable the program goals, minimize variability, and enhance quality of service.

5.2 Recommendations

Recommendations of the Research Study Based on the insights gathered from this research study, recommendations are proposed to enhance the performance of the Orphans and Vulnerable Children (OVC) program. These recommendations aim to create a more effective and sustainable organizational culture while fostering meaningful collaboration with stakeholders.

Improve Motivation of Staff: Reward and acknowledge staff efforts on a regular basis. Provide space for creativity, professional growth, and access to the right inputs. Utilize workshops, mentoring, and feedback sessions to drive commitment and productivity. Improve Stakeholder Engagement: Institutionalize avenues of communication, e.g., meetings, questionnaires, and participatory workshops. Engage stakeholders in planning, decision-making, and program implementation with an eye towards developing responsibility and ownership. Utilize Effective Reward Mechanisms: Use a combination of monetary (bonus, promotion) and non-monetary rewards (training, appreciation, team reward). Reward individual and team achievement to generate motivation, morale, and overall performance. Promote

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Organizational Values: Bake and teach core values such as teamwork, accountability, and empathy into all endeavors routinely. Train frequently on applying the values in work every day to create a congruent and committed team.

REFERENCES

Al-Dalahmeh, M., Masa'deh, R., AbuKhalaf, R. K., & Obeidat, B. Y. (2018). The effect of employee engagement on organizational performance via the mediating role of job satisfaction: The case of IT employees in Jordanian banking sector. *Modern Applied Science, 12*(6), 352–365.

Allen, T., & Roberts, L. (2022). Stakeholder participation and service delivery in community welfare programs: Lessons from sub-Saharan Africa. *Journal of Social Development Studies, 8*(3), 145–162.

Armstrong, M. (2018). *Armstrong's essential human resource management practice: A guide to people management*. Kogan Page Publishers.

Azasu, S. (2019). Rewards and performance of Swedish real estate firms. *Compensation & Benefits Review, 41*(4), 19–28.

Bajaria, S., Exavery, A., Toroka, N., et al. (2021). Poor linkage to care for HIV-positive OVC with disabled caregivers: A longitudinal study in Tanzania. *BMC Public Health, 21*, 365.

Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology, 22*(3), 273–285.

Carter, R., & Sanchez, A. (2023). Diversity and stakeholder engagement: Enhancing organizational decision-making and performance. *Global Journal of Management and Social Sciences, 12*(2), 51–68.

Durdyev, S. (2017). The role of stakeholder engagement in construction project performance. *Procedia Engineering, 182*, 682–689.

Eldor, L., & Vigoda-Gadot, E. (2018). The nature of employee engagement: Rethinking the employee–organization relationship. *The International Journal of Human Resource Management, 28*(3), 526–552.

Exavery, A., Charles, J., Barankena, A., Kuhlik, E., Mubyazi, G. M., Tani, K., Ally, A., Minja, E., Koler, A., Kikoyo, L., & Jere, E. (2020). ART use and associated factors among HIV-positive caregivers of orphans and vulnerable children in Tanzania. *BMC Public Health, 20*(1251), 1–10.

Gapor, R. P., & Rubang, T. (2020). Engagement and performance among administrators of public secondary school in Nakhon Nayok, Thailand. *World Journal of Education, 10*(5), 29–44.

Gill, M. M., Jahanpour, O., van de Ven, R., Barankena, A., Urasa, P., & Antelman, G. (2021). HIV risk screening and HIV testing among orphans and vulnerable children in community settings in Tanzania: Acceptability and fidelity to lay-cadre administration of the screening tool. *PLOS ONE, 16*(3), e0248751.

Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2019). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: A meta-analysis. *The Journal of Applied Psychology, 87*(2), 268–279.

Heravi, A. (2015). The impact of early contractor involvement on project performance. *International Journal of Project Management, 33*(6), 1321–1330.

Hokororo, A. E. (2020). The effect of reward system on employee performance in public organization: A case of Rombo District Council, Tanzania. *Journal of Developmental Management, 3*(4), 21–29.

Jackson, L., Njoroge, P., & Otieno, F. (2019). Community-driven health programs and stakeholder engagement in rural regions. *African Journal of Community Health, 11*(2), 74–89.

Jones, D., Mwakio, P., & Okoth, J. (2021). Stakeholder engagement and organizational performance in child welfare programs in East Africa. *Journal of Developmental Management, 5*(4), 201–219.

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*(4), 692–724.

Kassim, K. A., Gichunge, E., & Mbithi, M. (2022). Effects of organizational culture on the performance of charitable non-governmental organizations in Kenya: A case of Save the Children International Kenya. *Journal of Economics, Management Sciences & Procurement, 4*(2), 112–125.

Kimathi, L., & Henry, M. (2020). Reward systems and employee motivation in faith-based organizations: Evidence from Kenya. *Journal of Human Resource Management, 8*(2), 55–66.

Kinyanjui, J., & Ochoti, G. (2016). Stakeholder engagement and organizational performance in Kenyan firms. *International Journal of Business and Social Science, 7*(9), 112–120.

Kothai, P. (2014). Importance of stakeholder involvement in scheduling construction projects. *International Journal of Civil Engineering Research, 5*(3), 245–252.

Kothari, C. R. (2019). *Research methodology: Methods and techniques* (4th ed.). New Age International Publishers.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610.

Licensed Under Creative Commons Attribution (CC BY-NC)

Luthans, F., & Youssef, C. M. (2021). *Psychological capital and beyond*. Oxford University Press.
Mambwe, M., Chileshe, N., & Lungu, M. (2020). Stakeholder engagement and performance of road construction projects in Zambia: The case of the L400 road project. *Journal of Engineering, Design and Technology, 18*(5), 1247–1265.
Muchira, J. M., Ngui, T., & Mathenge, P. (2018). Influence of employees training on faith-based organizations performance: A case of Catholic Diocese of Embu. *Journal of Human Resource & Leadership, 2*(6), 13–34.
Muleya, D., Ngirande, H., & Terera, S. R. (2022). The influence of training and career development opportunities on affective commitment: A South African higher education perspective. *SA Journal of Human Resource Management, 20*, a1620.
Muriuki, L., & Wanjohi, E. (2023). Community-based child welfare initiatives and social cohesion in Kenya. *African Journal of Community Development, 14*(2), 58–73.
Mutunga, D. J., & Gachunga, H. (2015). Influence of reward systems on organizational performance in Kenyan companies. *Strategic Journal of Business & Change Management, 2*(18), 324–345.
Mwanaumo, E. (2019). The role of stakeholder engagement in enhancing safety performance in construction projects. *Zambian Journal of Project Management, 4*(1), 15–27.
Ngamau, N. W., & Ragama, P. (2020). Effects of strategic alignment of organization culture, structure, talent, and knowledge management systems on the performance of NGOs in Nakuru Town, Kenya. *International Journal of Business and Management, 12*(3), 45–59.
Ngaruiya, E., K'aol, G., & Njenga, K. (2023). Influence of sustaining effective organizational culture on organizational performance of pharmaceutical companies in Kenya. *Research Journal of Business and Finance*.
Nguyen, T., Pham, L., & Tran, K. (2020). Community-based engagement and service quality in Southeast Asia: A stakeholder approach. *Asia-Pacific Journal of Development Studies, 7*(2), 89–107.
Nwogu, E., & Ochieng, F. (2022). Challenges in the implementation of OVC programs in East Africa: A comparative study of Uganda and Tanzania. *Journal of Social Welfare and Human Services, 9*(3), 144–161.
Nyamori, R., & Bagaka, J. (2018). The effect of stakeholder engagement on organizational performance: A case of Kenyan public sector organizations. *International Journal of Contemporary Business Studies, 4*(6), 77–89.
Otwori, N. L., & Juma, D. (2017). Effect of organizational values on employee performance: A case of Urban Roads Authority. *International Journal of Science and Research (IJSR), 6*(6), 100–104.
Owuor, D. O., Kuria, H. K., & Kariuki, A. (2020). Effects of organizational culture and organizational learning on NGOs: A perspective from Nairobi, Kenya. *The Strategic Journal of Business & Change Management, 7*(1), 1087–1104.
Polychroniou, P., & Trivellas, P. (2018). The impact of strong and balanced organizational cultures on firm performance: Assessing moderated effects. *International Journal of Quality and Service Sciences, 10*(1), 16–35.
PCEA. (2018). *Annual report on OVC program performance*. Presbyterian Church of East Africa.
Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.
Rahman, M., & Alzubi, K. (2015). Critical success factors for construction projects: A stakeholder perspective. *International Journal of Construction Management, 15*(1), 45–57.
Riyanto, S., Endri, E., & Herlisha, N. (2021). Effect of work motivation and job satisfaction on employee performance: Mediating role of employee engagement. *Problems and Perspectives in Management, 19*(3), 162–174.
Sachs, A. M. (2022). Caring human resources management and employee engagement. *Human Resource Development Quarterly, 33*(1), 55–75.
Schein, E. H. (2019). A new era for culture, change and leadership. *MIT Sloan Management Review, 60*(4), 52–58.
Smith, A., & Brown, T. (2021). Operational efficiency and service delivery in non-profit child welfare programs. *International Journal of Social Program Management, 7*(1), 88–104.
Sungmala, K. (2021). Employee engagement and performance: A comparative study between parent and subsidiary companies in Thailand. *Asian Management Review, 9*(1), 88–101.
Talley, J. L., Schneider, J., & Lindquist, E. (2017). A simplified approach to stakeholder engagement in natural resource management: The Five-Feature Framework. *Ecology and Society, 21*(4), 38.
Tarimo, S. U., Onyancha, H., & Mbua, F. (2024). Effects of organizational values on employee job performance at NSSF Kilimanjaro Region, Tanzania. *Open Journal of Business and Management, 12*(6), 3930–3952.
Torlak, N. G., Demir, A., & Budur, T. (2022). Decision-making, leadership and performance links in private education institutes. *Rajagiri Management Journal, 16*(1), 63–85.
UNICEF. (2022). *Annual report 2022*. United Nations International Children's Emergency Fund.
Wu, C. H., Kwan, H. K., Liu, J., & Resick, C. J. (2017). Values, satisfaction, and organizational performance: A study of Chinese and Taiwanese firms. *Asia Pacific Journal of Management, 34*(3), 621–644.

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Zhu, J.-J., & Song, H.-M. (2022). The impact of career growth on knowledge-based employee engagement: The mediating role of affective commitment and the moderating role of perceived organizational support. *Frontiers in Psychology, 13*, Article 805208.

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Relationship between psychological forms of gender-based violence and students' test scores in public secondary schools in Bungoma County, Kenya

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ABSTRACT

Studies on gender-based violence (GBV) among students in Kenya have focused mostly on the physical and sexual aspects of the violence and have not paid much attention to the psychological aspects and their direct effects on the academic performance of students. This article was specialized to look at the correlation between psychological GBV and the test scores of students in the public secondary schools in Bungoma County. The research design utilized in the study was a correlational research design based on the social feminism theory and the resilience theory to comprehend the impact of emotional abuse, insults, threats, isolation, and intimidation of learners on their academic accomplishment. There was a stratified random sample size of 1,104 students in a population of estimated student age of 15 to 17 years, amounting to about a quarter of a million students in 184 randomly selected secondary schools. Also, 184 guidance and counseling teachers, 3 sub-county directors of education, 13 GBV survivors, and 1 county woman representative were qualitatively sampled through purposive sampling. Collection of data was carried out by use of questionnaires, interviews, and document analysis. Likert-type scales saw into the psychological experiences of GBV, and the internal reliability of instruments was checked through the Cronbach Alpha coefficient. The descriptive and inferential statistics were used (Pearson Product-Moment Correlation and linear regression) to analyze quantitative data, whereas the qualitative data were analyzed on the basis of the themes. The findings showed a weak negative significant correlation between psychological violence and the student grades in internal school tests ($r = -.076$, $p = .037$), which meant that in cases of students exposed to emotional and psychological abuse, their performance in internal school exams was degraded. These results were also supported by qualitative data analysis, as the predominant themes identified involved constant experiences of verbal abuse, manipulation, and ostracism by peers and teachers that negatively affected self-esteem and academic motivation of the students. These findings are the testimony of the need to be more attentive to psychological violence in schools, which is one of the risky types of GBV. The study suggests specific recommendations, and they are the provision of adequate psychosocial support, emotional safety training, and inclusive school environments that are responsive and sensitive to emotional harm in students. Addressing psychological GBV, the article also provides stewardship in understanding the premise of educational equity and student well-being, in turn, in advocating the need to move policy and practice to promote safer and more supportive learning environments.

Keywords: Academic Performance, Bungoma County, Emotional Abuse, Psychological Gender-Based Violence, Public Secondary Schools, Resilience Theory, School Safety, Social Feminism, Student Well-Being, Test Scores

I. INTRODUCTION

Education is recognized universally as a human right and, as such, it is the duty of the state to provide education, and also as a prerequisite to sustainable social, cultural, and economic development of any country. The focus on the significance of inclusive and equal quality education, including the encouragement of lifelong learning opportunities to all of the learners, has been promoted at the global level by the Sustainable Development Goal 4 (SDG4). The successful achievement of this objective is, however, jeopardized by the continued occurrence of school-related gender-based violence (SRGBV) in most low- and middle-income countries, including Kenya, which adversely affects the safety, well-being and educational outcomes of learners (United Nations Educational, Scientific and Cultural Organization (UNESCO, 2016). Although the problem of physical and sexual gender-based violence (GBV) has been intensively researched, its psychological component retains the less advanced presentation, that is, verbal abuse, ridicule, intimidation, isolation, and threats, which, otherwise, have not yet acquired a sufficient level of research and discussion despite their long-term effects on the emotional and academic development of learners (Muluneh et al., 2020; Nyoni, et al., 2023).

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The psychological GBV, which is rather unwritten and naturalised in schools, may severely damage a self-image, psychological and emotional balance, and even the willingness to learn in the future. It is perpetrated by both peers, school administration and teachers, and it is frequently not opposed or checked in patriarchal societies that have a strong feeling of hierarchy (Maphosa, 2017). Emotional abuse in the form of accumulation of experiences also results in a high anxiety scale, lack of interest in the learning process and, in the most extreme cases, causes insufficient development of the learning process. UNESCO (2019) points out that violence of this nature at schools has the effect of producing unfavorable learning conditions that hamper the healthy intellectual development process and undermine the safeguarding capabilities, which schools are supposed to perform.

School-based GBV is a serious challenge in Kenya especially in the rural regions. Psychological violence is among the most and least reported types of abuse amongst adolescents according to Kenya Demographic and Health Survey (KDHS, 2022). Bungoma County has turned out to be amongst the areas with the most serious prevalence of GBV in the nation with about 23 percent of the reports of sexual and gender-based torments already being registered in the county, exceeding the national average of 13 percent. Though physical and sexual forms of abuse have received more academic and media coverage, psychological forms are still invisible and at large in policy, as well as, research. Experiences of ridicule, intimidation, and manipulation of emotions are normal occurrences faced by students especially girls perpetrated by their peers and teachers. All the boys, being victims too, often mask their pain under social loyalty with masculinity that leads to a lack of reporting (Centre for Rights Education and Awareness (CREAW-Kenya, 2022).

Many researchers have indicated a correlation between GBV and the decreased academic achievement, and violence has been identified as a factor that causes truancy, deteriorating test results, and higher dropout rates (Jesca, 2017).; Peart, 2019). Nevertheless, the research articles are more likely to generalize GBV and do not focus on the particular contribution of psychological violence to the academic outcomes. In most instances, national examination performance results e.g., Kenya Certificate of Secondary Education (KCSE) are adopted as the main benchmark of academic success, which, in fact, does not indicate the underlying struggle that students undergo in the area of internal classroom tests (Gichuhi, 2023.; Bravo-Sanzana et al ., 2022). It is a gap in the literature that impedes the elaboration of specific interventions that can overcome emotional violence as a discrete factor influencing the performance of learners.

The effects of emotional abuse are usually compounded in rural counties such as Bungoma where poverty, cultural conservatism, and institutional silence all come together. Most of the public secondary schools lack the necessary capacity to identify or intervene in GBV of a psychological nature. There remain severe gaps in child protection and psychosocial support within Kenya's education system. A recent UNICEF report highlighted a critical shortage of trained child welfare officers, noting that 39 of Kenya's 47 counties have fewer than four social service professionals per 100,000 children. Many existing staff lack proper induction and continuous professional development, which leads to overwhelming caseloads and burnout, leaving emotional violence largely unaddressed (UNICEF, 2025). This is further aggravated by weak coordination and monitoring mechanisms between education, social services, and protective agencies, which hinder effective reporting and response systems in schools (Kissui, 2024; UNESCO, 2023).

The research was based on two theories, which are Social Feminism and Resilience Theory. Social Feminism gives us a scope to view the patriarchal and institutional power relations that perpetuate emotional violence in schools and hence keep victims quiet (Hooks, 2000). This is complemented by the Resilience Theory, which looks into the factors that made students revert to their normal lives of studying despite the ever present threat of emotional abuse to the lives of students despite the adversity that they underwent and proceed with the academic work (Masten, 2001; Ungar, 2008). Such a combination of frameworks guarantees the presence of a multidimensional explanation of the interaction between structural inequalities, emotional trauma, and student performance.

This study contributes to closing a knowledge gap since it pays specific attention to psychological GBV, and using internal academic outcomes. It presents a localized, empirical knowledge about the effect of emotional abuse on students test scores in classrooms and the dire need of introducing gender-sensitive interventions with psychosocial considerations to Kenyan secondary schools. The results will be used to recommend policy and practices in the area of emotional safety and support networks thereby making the learning system inclusive and protective to all learners.

1.1 Statement of the Problem

Gender-based violence (GBV) in Schooling still poses a danger to the rights of education and the lives of students, especially in Bungoma County which is located in the Kenyan countryside. Although physical and sexual GBV have been in the spotlight, psychological violence consisting of insults, threat, humiliation, isolation and abuses have hardly attracted research, policy, and school-level preventive measures. Nevertheless, these emotional abuses of children have significant implications on the mental health or mind, self-worth, and cognitive abilities of children, and these aspects are fundamental to succeeding academically. The prevalence of GBV is high in Bungoma County, the

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region where the form of violence against women and girls is most common in the country (UNESCO, 2019). Students and particularly girls are victims of everyday emotional violence by peers and teachers. Such experiences do not always have a record, have not been addressed, or even been punished because of the lack of institutional voice, poor reporting mechanisms, and the normalcy of abuse. Whereas prior literature has developed overarching connections between GBV and poor academic performance, little has been done in disaggregating the construct of psychological violence as a unique element or understanding its connection with intrapersonal test marks. This paper helps to fill this important gap because it identifies the relationship that exists between psychological forms of GBV and academic performance among students in government secondary schools within Bungoma. The results will inform more specific, evidence-based plans to enhance not only emotional safety but also overall improvement as well as the educational achievements of all learners.

1.2 Research Objectives

To investigate the relationship between psychological forms of gender-based violence and students' test scores in public secondary schools in Bungoma County, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study relied on two theoretical frameworks: Social Feminism Theory and Resilience Theory, which have provided a critical and interpretive framework for understanding the issues affecting the academic performance of students due to psychological gender-based violence (GBV).

Social Feminism Theory promotes the role of structural disparities and patriarchal rules in continuing emotional mistreatment in schools. It assumes that in many cases, educational institutions reflect broader power relations within society, such that gender roles and expectations shape and define learning behaviors, attitudes, and access to opportunities (Hooks, 2000). These patterns occur in school as teacher student relationships, peer hierarchy, and condoning emotional abusive behaviours, particularly with girls, and students who are gender nonconforming. The theory assists in the comprehension of how normalized abuse may assume the form of words and forms of nonthreatening acts of social intimidation, and unequal access to social resources, training in schools through gendered power relations, which promotes structural disadvantage and limits academic opportunities.

The Resilience Theory, in its turn, looks into the adaptive and prosperity process of individuals in unfavorable conditions. According to the work by Masten (2001), resilience is not a personal attribute, but a process, which is dictated by both internal/environmental defense and external conditions. School-based resilience occurs among some scholars who are resilient despite the occurrence of emotional violence, and who are guided by good peer or teacher relationships, or inner motivation (Ungar, 2008). With this theory in mind, the view on why certain students still perform well in their schoolwork even in instances where other students in the same situations of abusive behavior have failed to do so is subtle.

These frameworks, in combination, illustrate why it is essential not only to document the consequences of psychological GBV on academic performance but also to understand the institutional contexts and personal coping strategies underlying them.

2.2 Empirical Review

Many studies have documented the negative effects of GBV on access, retention, and performance in education, but comparatively few have directly addressed psychological GBV and its impact on test scores.

As Muluneh et al. (2020) describes, psychological violence is less visible since it causes emotional pain that distorts concentration, memory, and the learning process in general. The study by Chigiji, et al. (2018) in Zimbabwe has found that verbal abuse and humiliation of the students by teachers result in high rates of low engagement and apathy towards studying. Similarly, the Tanton et al. (2023) study found that emotional abuse teenagers scored lower in the standardized tests than their counterparts.

School-related gender-based violence (GBV) research in Kenya has been largely based on sexual violence and corporal punishment, and relatively less attention has been paid to emotional abuse. The African Population and Health Research Center (APHRC, 2025) explained the seriousness of psychological and emotional violence, such as verbal abuse and emotional harm, in Kenyan schools, noting that such experiences are frequently associated with other types of violence and multiplied the impact of such violence on both the well-being of learners and their academic achievements. Likewise, Gichuhi (2023) noted that repeated cases of emotional GBV often caused withdrawal and lack of interest in schooling, especially in girls in rural areas.

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Although the findings of current research attest to the fact that psychological GBV hurts learning, the majority use broad indicators like the KCSE or dropouts as signs of academic achievement. Many do not disaggregate by type of violence or evaluate the effect on internal test scores, which are more relevant to everyday academic performance. In addition, the majority of existing studies lack a theoretical framework that enables them to examine how the relationship between the power structure and the emotional resilience of students unfolds.

In the case of this research, the identified gaps met these objectives specifically because the research was dedicated to psychological manifestations of GBV (insults, threats, emotional manipulation), and how they impacted on internal test scores of students in public secondary schools of Bungoma County. It is based on Social Feminism as well as Resilience Theory, and it brings new empirical evidence to support the fact that many policy, advocacy, and psychosocial interventions in schools are needed.

III. METHODOLOGY

3.1 Research Design

The research design used in this study was a correlational research design to determine the relationship between psychological gender-based violence and test scores among students in government secondary schools in Bungoma County. The design was suitable for identifying the direction and intensity of relationships between variables without controlling them, which is why it could be used to study naturally occurring phenomena, such as emotional abuse and academic outcomes. It has also enabled the researcher to measure the magnitude with which psychological GBV affects academic achievement, which is appropriate within the context of this study, given the emphasis on non-experimental observation (Muluneh et al., 2020).

3.2 Study Area

The study was based on the area of Bungoma County in Kenya, where the prevalence of gender-based violence, including elements of emotional abuse in schools, is high (KDHS, 2022). The county has both urban and rural primary and secondary schools, and the sample provides a representative size of both urban and rural communities to study the impact of psychological violence on learner performance. The choice of schools in the region was conditioned because there were constant reports of verbal abuse, threats, and emotional neglect by peers and teachers.

3.3 Target Population

The target population consisted of approximately 250,000 students in 342 government secondary schools in Bungoma County. Additionally, it was primarily conducted to educate individuals in the Heads of Guidance and Counseling sections, Sub-County Directors of Education, GBV survivors, and the County Woman Representative, who provided knowledge on emotional GBV, as well as institutional policies and responses to the issue. These groups were selected due to their significant influence on the education and policy practice environment.

3.4 Sampling Techniques and Sample Size

In this research, both probabilistic and non-probabilistic sampling methods were used so that there would be a full representation. A stratified random sampling was used to select 184 schools in the county with 342 open secondary schools. A stratification was done using the sub-county level to guarantee balance in geography. Simple random sampling was used to sample 1,104 students in the chosen schools. This process minimized selection bias and accorded each student an equal chance of being selected. On the other hand, the qualitative section of the study used purposive sampling in determining the research participants. Specifically, they were purposely recruited 184 heads of the departments of Guidance and Counseling, 13 GBV survivors, 3 Sub-County Directors of Education, and 1 Woman Representative of a county due to their knowledge and experience in Guidance and Counseling and/or because of lived experience in the purpose of a study. The advantage of the mixed-methods sampling design was to ensure the maximum validity and reliability of the study since not only was the overall results statistically representative, but also the qualitative data could be selectively captured since it was of high-quality.

3.5 Data Collection Instruments and Procedures

The study used both the quantitative and qualitative research designs in order to collect comprehensive and credible data. Quantitative measure was to be carried out by the use of a structured questionnaire that would be administered in a face-to-face manner. The methodology allowed the researcher to define ideas, clear confusion, and bring consistency in the interpretation of the questions. The questionnaire collected data about the existence of psychological GBV that were faced by students and their performance in the recent test. Semi-structured interviews with willing GBV survivors, education officers, and school counselors were used in the qualitative component and

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were used to collect detailed descriptions of emotional violence and institutional responses. There was also document analysis to review the school policies, disciplinary records and GBV reports in existence. These reports provided information about the background of the implementation and how the schools address and/or fail to address psychological abuse. A pilot study was carried out in a mixed-day secondary school which was not part of the final sample to determine the validity and reliability of the instruments. The tools were refined with the help of pilot feedback to be less culturally irrelevant, ambiguous, and inapplicable.

3.6 Validity and Reliability

To enhance validity, the research tools were reviewed with academic research experts and modified based on the results of the pilot study. They examined whether their items aligned with the research goals and were culturally applicable. Validity was assessed using Cronbach's Alpha coefficient, indicating an acceptable internal consistency among the questionnaire's questions. This affirmed the reliability of the measurement of the constructs of psychological GBV and academic performance with the instruments (Nyoni et al., 2023).

3.7 Data Analysis Techniques

Data analysis comprised both quantitative and qualitative processes, aligning with the mixed-methods design of the study. The Statistical Package for the Social Sciences (SPSS) Version 26 was used to analyze the quantitative data from student questionnaires, respondent characteristics and the prevalence of psychological GBV. Summary information, including frequencies and percentages, was derived using descriptive statistics, presented in the form of pie charts and bar graphs. Relationships and significance levels were then tested using inferential statistics. In particular, the direction and strength of the association between the students and their test scores, as well as the psychological GBV, were determined using the Pearson Product-Moment correlation. Analysis of Variance (ANOVA) was conducted to find out whether the significance of the differences in the academic performance depended on the differences in the level of exposure (Gichuhi, 2023). Thematic analysis and discourse were used to analyze interviews and document-based qualitative information. It was made possible by data coding, determining patterns and duplications of themes, and examining data in broader social, cultural, and institutional contexts. The direct quotes were also included in the final analysis. The reason behind this was to retain the voices of the participants and to guarantee the authenticity of the findings. These qualitative observations complemented the results of the statistical analysis and offered a more detailed and extensive picture of psychological violence effect on academic progress (UNESCO, 2019).

IV. FINDINGS & DISCUSSION

The section presents the findings of both quantitative and qualitative data with observations on the effects of psychological gender-based violence (GBV) among the students enrolled in government secondary schools in Bungoma County. The results have been tabulated in thematic manner because the objective of the study was to examine emotional abuse and its impacts on internal test scores of students.

4.1 Nature and Frequency of Psychological GBV

The findings were that psychological violence was rampant in most Bungoma County secondary schools. According to students, they were victims of numerous types of emotional mistreatment, including verbal insults, ridicule, intimidation, and social exclusion. Table 1 demonstrates that ridicule was most frequently used based behavior with 26.5 percent of students citing that it happened to them, followed by humiliation (18.6 percent), verbal threats (14.3 percent), and social exclusion (10.1 percent), as part of the student reactions analyzed in the thesis.

Table 1

Frequency of Psychological GBV Experienced by Students

Type of Psychological Abuse	Frequency	Percentage
Ridicule	293	26.5%
Humiliation	206	18.6%
Verbal Threats	158	14.3%
Social Exclusion	111	10.1%
Other	336	30.5%

These experiences were often dismissed by staff as disciplinary mechanisms or student conflicts, with little acknowledgment of their emotional harm. One student remarked,

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> "*Sometimes teachers ridicule us in front of our classmates and call us names like 'blockhead' or 'failure'. It becomes hard to speak up in class again."*

Another added,

> *"The teacher once told me that I should not bother coming to school since I would amount to nothing. I started skipping school".*

These qualitative accounts confirm that psychological GBV is both frequent and psychologically damaging to students' classroom engagement and participation.

Academic Performance

The academic performance of students was measured using their most recent internal examination scores. The analysis showed an overall mean score of 58% (SD = 10.2), with male students averaging 59% and female students 57%. Urban schools recorded higher mean scores (62%) than rural schools (55%). Nearly 42% of the students scored below the pass mark of 50%, indicating a substantial proportion of learners were at risk of underachievement. These results provide the baseline for assessing how psychological forms of GBV may influence variations in students' academic outcomes.

Table2

Descriptive Statistics for Academic Performance

Group	Mean (%)	SD	% Below Pass Mark
Overall	58	10.2	42%
Male students	59	—	—
Female students	57	—	—
Urban schools	62	—	—
Rural schools	55	—	—

4.2 Relationship between Psychological GBV and Academic Performance

The quantitative analysis employed Pearson's Product-Moment Correlation to establish the relationship between psychological GBV and students' test scores. The findings indicated a negative correlation (r = –.076) that was statistically significant (p = .037), as shown in Table 3. Though the correlation is weak, it is significant enough to suggest that students exposed to more psychological abuse tend to perform worse academically.

Table 3

Pearson Correlation between Psychological GBV and Academic Performance

Variable Pair	N	Pearson's r	p-value
Psychological GBV & Test Scores	1104	–0.076	0.037

These findings are in line with Gichuhi, (2023) who observed similar negative effects of emotional violence on academic outcomes, noting that emotional stress undermines concentration, motivation, and participation in learning activities. Teachers interviewed in the study confirmed this pattern. A head of the Guidance and Counseling department explained,

> *"We have seen bright students deteriorate after being constantly targeted by negative remarks from teachers. Some even stop attending certain lessons".*

This reinforces the view that emotional safety is integral to student academic performance.

4.3 Gendered Experiences of Psychological GBV

The findings also revealed gendered patterns in the experience of psychological violence. Girls were more likely to face mockery, shame, and body-related humiliation, particularly around menstruation, while boys reported isolation, emotional neglect, and harsh discipline. This gender disparity is captured in several student statements. For instance, one female student respondent noted,

"The teacher mocked me in front of the class for being dirty during my periods. I felt ashamed and did not return to school for three days".

Similarly, a male student explained,

> *"Boys are expected to be tough. The teachers say you are weak when you cry or when you report bullying. And so, we keep silent".*

Such reactions show that social construct helps determine the character and shape of emotional abuse, as girls are exposed to embarrassment and boys to self-crisis and suppression. These forms of gender are indeed in line with

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what Nyoni, *et al*. (2023) argues, as the traditional gender roles influence the perception and outcome of GBV in schools.

4.4 Institutional Response and Policy Implementation Gaps

Although the results show a positive relation to psychological GBV concerning institutions, the policy promises made by the Ministry of Education show that the system is poor in its reactions towards psychological GBV. Most schools do not have clear guidelines for detecting, reporting, and intervening in instances of emotional abuse. School officials interviewed showed that cases of emotional violence were not noticed or addressed formally.

One of the Directors of Education in a Sub-County said,

> *"Schools pay more attention to violence of a physical or sexual nature. The problem of emotional abuse is difficult to trace, and no tools are offered in order to tackle the problem."*

This affirmation leads to a significant decrease in follow-through at the national level and in practice at the school level. Irregularities in reporting these GBVs were also discovered in the document reviews. As an example, a majority of schools had unorganized GBV registers or competent individuals to process emotional abuse cases. Furthermore, students stated that a fear of retaliation, coupled with a lack of confidence that their report would be believed, deterred them from reporting their absence.

4.5 Coping Strategies and Student Resilience

There were also some positive findings regarding the students' resilience in the face of the challenges. Other students said that they developed coping mechanisms so as not to lose track of their academic objectives despite being constantly maltreated emotionally. These included peer support, personal motivation, and spiritual strength.

One student affirmed,

> *"Even when teachers shout or humiliate me, I try to stay focused. I want to be the first in my family to join university".*

These expressions align with Resilience Theory (Masten, 2001), which posits that individuals may develop adaptive responses to adversity. However, such coping mechanisms should not be relied upon as a substitute for structural interventions, as the emotional burden on students is substantial and often long-lasting.

4.6 Institutional and Socio-Cultural Factors Reinforcing Psychological GBV

While psychological violence is often normalized in school settings, its persistence is significantly influenced by institutional cover-ups, weak enforcement of policies, and socio-cultural silence—all of which create a fertile ground for emotional abuse to thrive. Interviews with Sub-County Directors of Education (SCDEs), Guidance and Counseling heads, and the County Woman Representative revealed widespread concern over the failure of schools to effectively respond to emotional and verbal forms of abuse.

One SCDE explained:

> *"We receive cases of verbal abuses from teachers and parents. But when we try to follow up, they say the issue has been sorted at home. Many schools do not even document these cases".*

This illustrates a pattern of institutional negligence where psychological abuse is treated as minor misconduct, rather than a form of violence that impacts learning outcomes. In some cases, teachers accused of humiliating or ridiculing students were protected by school administrators or teacher unions, making it difficult to hold perpetrators accountable (Wangechi, 2021).

Students' testimonies also highlight the emotional burden caused by impunity. One survivor of psychological GBV shared:

> *"When you report insults from a teacher, they say you are being dramatic or disrespectful. You just learn to keep quiet".*

This silence is reinforced by social norms that discourage vulnerability, particularly among boys, and by a lack of safe reporting mechanisms in schools (Barasa et al., 2021). As one SCDE emphasized:

> *"The major problem is not lack of laws, but how schools respond. If the victim is threatened or the matter is settled privately, the damage is still there but now invisible".*

Such institutional and cultural dynamics exacerbate the psychological harm experienced by students, resulting in increased stress, absenteeism, and disengagement from schoolwork (Gichuhi, 2023). These findings align with the Social Feminism framework, which views emotional abuse as an extension of broader power structures that marginalize student voices (Hooks, 2000), and Resilience Theory, which explains why some students endure and adapt under psychological strain while others falter (Masten, 2001; Ungar, 2008).

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The findings affirmed that psychological GBV (in the form of verbal insults, threat, humiliation, isolation, and intimidation) is largely associated with poor academic performance amongst students. Though this relationship was moderate to low in some aspects, the qualitative data proved to be the development of a well-established culture of emotional abuse, which was tolerated to a significant degree in schools. The findings, obtained with the help of the prism of the Social Feminism Theory, point to the notion that psychological violence in school is a reverberation, as much as a validation, of institutionalized power-hierarchies and patriarchal systems. The victims are girls/boys who are mocked at, emotionally blackmailed, and verbally demeaned by their teachers, other students, and even school administrators. These forms of contact abuse continue to go unreported or unresolved, caught between the teeth of cultural silence, fear of backlash or administrative cover-ups and thereby adding more emotional weight on the learners.

The Resilience Theory explains how certain students resist change and learn to cope with emotionally challenging environments. The strength, however, can gloss over the damage in this situation. Academic focus may become a survival mechanism that students uphold or enhance; however, this survival requires fragile support, which cannot be maintained without institutional assistance. The research also identified what it termed as weak points in the delivery of gender-sensitive policies and reporting systems at the school level. Despite national policies aimed at fighting child abuse, such as the Basic Education Act, the Sexual Offenses Act, and child protection guidelines, even where such policies are implemented, there is very poor enforcement in the schools or a poor understanding of them in schools. The majority of schools in Bungoma do not have proper psychosocial support, qualified personnel, or a secure environment where students can report psychological abuse, hence leading to the trend of emotional abuse and poor academic performance.

5.2 Recommendations

Following the results of the study, several practical measures are suggested to enhance the academic performance of students through managing psychological gender-based violence (GBV) in the setting of public secondary schools in Bungoma County. The enhancement of school-based psychosocial support systems is first critical. Schools should have fully equipped counseling centers that are securely staffed with trained psychological counselors. These centers would give students a safe and confidential environment where they can report cases of emotional abuse and take the necessary care so that they can counteract the negative psychological effects that affect their academic performance. Moreover, the Ministry of Education is supposed to introduce and establish mandatory in-service training on psychological GBV identification, prevention, and mitigation among teachers. Academic and emotional abuse may include verbal insults, humiliation, threats, and intimidation, which numerous educators may not take seriously. Therefore, it is important to build awareness on these issues to improve professional ethics practice and reduce the normalization of emotional abuse in schools.

Additionally, schools should create a reporting mechanism which is clear and anonymous so that students can report psychological violence without the fear of rebuke. This can be through suggestion boxes, encrypted online forums or student welfare officers. These reports should not be overlooked; they should be investigated and corrective and protective measures taken subsequently. The Life Skills and Civic Education curriculum should also include psychological GBV sensitization. Through educating students on the meaning of emotional abuse, understanding resilience and the rights of students in school, a culture of self-advocacy and respect towards each other will be created. Communal and parental involvement should not be restricted to the school walls. The sensitization forums and workshops are supposed to be used to equip the parents and the local leaders with knowledge on how to identify the emotional violence and assist the learners who are in distress, as it is the cultural norms that encourage the silence on the GBV. Regular school environment audits should be conducted by the Teachers Service Commission (TSC) and the Ministry of Education (with the cooperation of county education offices) to enhance the effectiveness of policies. Emphasis during these audits should also include how the institutions are handling the problem of emotional abuse, and those institutions that are found to be involved in the cover-ups of such instances should be called to account. Lastly, new studies on a more local and longitudinal basis should be pursued to investigate the gendered effects of psychological GBV further. Psychological violence is an interpersonal outcome that is not disaggregated in such research and thus cannot build specific strategies and evidence-based policy intervention to GBV.

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REFERENCES

African Population and Health Research Center. (2025). *School-related gender-based violence in Kenya: Gaps and recommendations* [Policy brief]. https://aphrc.org/publication/school-related-gender-based-violence-in-kenya-gaps-and-recommendations/

Barasa, S. F., Wamue-Ngare, G., & Wanjama, L. (2021). Experience of school-related gender-based violence by pupils and the culture of silence: A case of primary Schools in Kasarani District, Nairobi County, Kenya. *International Journal of Business and Management*, *1*(1), 70-95.

Bravo-Sanzana, M., Bangdiwala, S. I., & Miranda, R. (2022). School violence negative effect on student academic performance: a multilevel analysis. *International journal of injury control and safety promotion*, *29*(1), 29-41.

Chigiji, H., Fry, D., Mwadiwa, T. E., Elizalde, A., Izumi, N., Baago-Rasmussen, L., & Maternowska, M. C. (2018). Risk factors and health consequences of physical and emotional violence against children in Zimbabwe: a nationally representative survey. *BMJ global health*, *3*(3), 34-39.

CREAW-Kenya. (2022). *Status of GBV in Bungoma County: Policy brief on SGBV reporting, response, and redress*. Centre for Rights Education and Awareness.

Gichuhi, L. (2023). Gender-Based Violence among Learners in the Coastal Region of Kenya: Voices from the Local Administration. *Journal of the Kenya National Commission for UNESCO*, *2*(1), 23-29. Retrieved from https://journals.unesco.go.ke/index.php/jknatcom/article/view/17

Hooks, B. (2000). *Feminism is for everybody: Passionate politics*—South End Press.

Itegi, F. M., & Njuguna, F. W. (2013). Gender based violence in educational institutions and its impacts on girls' education: A comparative study of selected countries. *Research Journal in Organizational Psychology & Educational Studies*, *2*(5), 276-279.

Jesca, N. (2017). *The impact of gender-based violence on academic performance of children in Kasese district: a case study of Hima Town Council*. Kampala International University, College of Humanities and Social Scienceshttps://ir.kiu.ac.ug/items/7b7d0dd7-9094-465b-b230-aaabf0e2377e

KDHS. (2022). *Kenya Demographic and Health Survey - 2022 - Kenya National Bureau of Statistics*. Kenya National Bureau of Statistics. https://www.knbs.or.ke/reports/kdhs-2022/

Kissui, J. (2024). School-related gender-based violence in Sub-Saharan Africa: Challenges and policy gaps. *Social Sciences*, *13*(7), 375. https://doi.org/10.3390/socsci13070375

Maphosa, B. (2017). Reducing gender-based violence: action research among Zimbabwean youth. *Building Peace via Action Research: African Case Studies*, 95-118.

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist, 56*(3), 227–238. https://doi.org/10.1037/0003-066X.56.3.227

Muluneh, M. D., Stulz, V., Francis, L., & Agho, K. (2020). Gender-based violence against women in sub-Saharan Africa: A systematic review and meta-analysis of cross-sectional studies. *International Journal of Environmental Research and Public Health, 17*(3), 903. https://doi.org/10.3390/ijerph17030903

Nyoni, T., Steiner, J. J., Okumu, M., Orwenyo, E., Tonui, B. C., Lipsey, K., & Mengo, C. (2023). The use and effectiveness of the whole school approach in school-based interventions addressing gender-based violence in sub-Saharan Africa: a systematic review. *Trauma, Violence, & Abuse*, *24*(5), 3615-3628.

Peart, N. (2019). Impact of violence on adolescent education in sub-Saharan Africa. *International Journal of Educational Development, 68*, 17–24. https://doi.org/10.1016/j.ijedudev.2019.04.004

Tanton, C., Jones, K. G., & Clifton, S. (2023). Associations between intimate partner violence and educational outcomes among adolescents. *Journal of Adolescence, 98*, 22–34. https://doi.org/10.1016/j.adolescence.2022.12.002

UNESCO. (2016). *Global guidance on addressing school-related gender-based violence*. United Nations Educational, Scientific, and Cultural Organization.

UNESCO. (2019). *Behind the numbers: Ending school violence and bullying*. Paris: United Nations Educational, Scientific and Cultural Organization.

UNESCO. (2023). School-related gender-based violence: Global status and response mechanisms. Paris: UNESCO Publishing.

Ungar, M. (2008). Resilience across cultures. *British Journal of Social Work, 38*(2), 218–235.

UNICEF. (2025, January 31). UNICEF warns of child protection crisis in Kenya amid severe staff shortages. Eastleigh Voice. https://eastleighvoice.co.ke/the%20state%20of%20children%20protection%20workforce%20in%20kenya/144687/unicef-warns-of-child-protection-crisis-in-kenya-amid-severe-staff-shortages

Wangechi, F. (2021). Institutional barriers to GBV reporting in rural schools. *East African Educational Review*, *9*(1), 77–91.

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Effectiveness of gender-based violence policy frameworks on academic achievement among public secondary school students in Bungoma County, Kenya

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ABSTRACT

Gender-based violence (GBV) is a prevalent challenge in schools across the whole world, and the role it plays in affecting the academic performance of students is getting a lot of consideration. In Kenya, numerous studies have mainly addressed the ill effects of GBV, yet studies that reflect the connection between GBV and academic performance, especially through internal test scores, are scarce. This paper evaluates the policy framework in dealing with GBV among students in public secondary schools in Bungoma County. The main questions tackled by the research included assessing the level of implementation of current policies in schools, establishing obstacles to the implementation of policies, and ascertaining effects of these policies towards the prevention and curbing of GBV. The study was based on social feminism theory and resilience theory, and its methodology was mixed-methods, i.e., both qualitative and quantitative data-collecting techniques were used. Out of the 342 secondary schools, a sample of 184 schools was identified, and a sample of 1,104 students, heads of guidance and counseling, sub-county directors of education, and GBV survivors were interviewed, and all these were included in the study. Questionnaires, interviews, and documents were used in the collection of the information. Quantitative data was submitted to the descriptive and then the inferential statistics; however, the results of the qualitative data were put under the theme analysis. The results indicated that although there are policies provided on how to address the GBV, there were loopholes in the implementation part, mainly in the rural counties like Bungoma County. The misallocation of resources, the absence of proper personnel training, and the inability to report are some of the key concerns. Findings of the research revealed that GBV policies existed but were not adequate, and the systems were not efficient towards assisting the survivors. The paper leaves us with the recommendations as to how it can be better and polished such that the present policy can be improved and made more effective in the process of creating a conducive, supportive educational environment with less bullying, etc. The paper highlights how it can support all students, including methods such as the implementation of safe reporting systems and increasing the level of training for the staff and the way the community can be included in making better policy.

Keywords: Academic Performance, Gender-Based Violence, Policy Framework, Public Secondary Schools, Resilience Theory, Social Feminism Theory

I. INTRODUCTION

Gender-based violence (GBV) is a pervasive issue in educational establishments in Kenya, and the consequences of such violence may be extremely grave as they pertain to experiences in the life of the student as well as the student's performance. This violence might take the form of physical, sexual and psychological maltreatment and all those forms can interfere with the performance of a student. Even though the detrimental effects of GBV have been enough publicized, limited research has been done on this topic as far as its direct relationship with internal test performance in Kenyan secondary schools is concerned. The relationship should be understood to improve the academically related environment and guarantee equal chances of the students to achieve academic success irrespective of their sex.

Kenya has gone a long way in terms of its response to GBV and laws, policies are signaling a termination of violence and safer school attributes. The legislative tool or instruments that have gained the most popularity as far as preventing GBV in schools is concerned is Kenya Gender-Based Violence Act (2015) and the Children Act (2001). However, the way these policies have been practically implemented has been of a concern, particularly in the rural areas such as Bungoma County since it might not be practically implemented because of social, cultural, and logistic reasons (Baiocchi *et al*., 2017). Research conducted previously has highlighted not only the importance of the

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existence of particular policies but also their suitable implementation across schools to safeguard students against violence and enable them to flourish in the academic setting (Baiocchi *et al.*, 2019). This research is intended to evaluate the effectiveness of GBV policy framework used in the secondary schools of Bungoma County and how it has influenced the performance of the school students.

Effects of GBV within the academic institutions also extend widely, especially on the mental wellbeing and performance of the institution. Nyakundi (2018) found that gender-based violence adversely affected students' self-esteem and academic performance, noting that survivors often struggled with low confidence and concentration difficulties. More recently, Yates *et al.* (2024) reported that undergraduate students who acknowledged experiences of GBV commonly experienced immediate challenges such as difficulty concentrating, avoidance of classes or campus, and a decline in academic achievement."

This is in line with the observations by Karanja (2019) who report that such violence and sexual harassment can reduce the cognitive involvement of students and their overall performance results. Such abuses result in an unfavorable learning experience, which not only hinders academic growth but also affects the emotional and psychological growth of students.

Global Partnership to End Violence Against Children (2021) cited the inverse relationship between school-related gender-based violence (SRGBV) and student performance. As one of many cases, GBV in Kenya reportedly contributes to high levels of absenteeism, reduced retention, and, in certain circumstances, full school dropout among girls (United Nations Childrens Fund [UNICEF], 2021). Nonetheless, current GBV policies have not been holistically applied to schools, and most schools in remote regions, such as Bungoma, have ineffective reporting systems and support strategies to attend to survivors (Baiocchi et al., 2017). Therefore, the effectiveness of such policies in reducing GBV and improving students' academic performance is questionable.

Although national policies may form a basis for the fight against GBV, Baiocchi et al. (2017) indeed mention that their local application may encounter setbacks, such as inadequate staff training, resource availability, and cultural opposition. This especially matters in Bungoma County, where gender-related traditional roles and attitudes to violence against women and girls may complicate the implementation of policies further. Karanja (2019) also observed the reluctance of most students especially in the rural areas to report violence because of the fear of retaliatory measures or stigmatization by the society which is another factor that hinders the efficacy of the existing policy framework.

The study was informed by Social Feminist Theory and Resilience Theory, which assisted in the assessment of the role of the policy framework in the minimization of GBV in secondary schools in Bungoma County. These theoretical frameworks can also be applied to a great extent since they emphasize the societal structures that encourage GBV and the coping strategies that people develop to respond to the dilemma. Social Feminist Theory provides an explanation as to why discrimination of GBV lies on gender inequality. Contrastingly, Resilience Theory looks at how students that undergo violence can participate in strategies that will assist them to remain on an academic path despite the misfortunes (Njoroge, 2010; Ungar, 2012).

1.1 Statement of the Problem

The current state of gender violence (GBV) in schools poses a huge menace to the safety, well-being, and academic success of students and in Kenya in particular. Despite the existence of national and regional policies concerning GBV prevention and response, which are aimed at preventing and mitigating GBV in learning institutions, their successful implementation in public secondary schools, especially in rural areas, where cases of GBV occur do cause significant doubts. Although more legislative frameworks have been established, including the Kenya Gender-Based Violence Act (2015) and the Children's Act (2001), their contribution to stopping GBV and enhancing educational levels among students has not been fully explored. The county of Bungoma is still experiencing incidences of GBV where physical, sexual, and psychological violence lead to both poor performance and emotional instability among students. However, no thorough evaluation has been conducted on the action plan to counteract these problems. Available literature on GBV in schools in Kenya has primarily focused on how GBV affects school-going students, specifically increased dropouts, poor academic performance, and higher school absenteeism. However, there has been a lack of sufficient attention to the extent to which policies implemented to prevent GBV are being successfully implemented and their effects on schools. This research aims to fill this gap by evaluating the success of the current GBV policy framework at the public secondary schools in Bungoma County. This study aims at identifying whether the policies are implemented efficiently, what challenges need to be overcome in the course of their implementation, and whether these policies have shown positive effects to attain a reduction of the instances of GBV and a safer learning environment. The fact that Bungoma County is a rural county means that the research will be very important in tracking the implementation of policies in real life situations and solving the local problems and defining the areas that need updating to ensure the safety of learners and their performance.

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1.2 Research Objectives

To assess the effectiveness of the policy framework on gender-based violence (GBV) in public secondary schools in Bungoma County.

II. LITERATURE REVIEW

2.1 Theoretical Framework

Two core theoretical frameworks were used to complete this study: Social Feminism Theory and Resilience Theory. These theories helped greatly in understanding processes of gender-based violence (GBV) in schools and the rural-based Bungoma County in particular, and how students may cope with its encounter.

2.1.1 Social Feminism Theory

The Social Feminism Theory believes that the gendered violence is not only an individual phenomenon but also roots itself into greater schemes of power in the society that in turn reinforces the disparities in relationship between the genders. It involves the sensitivity of social norms, values, and patriarchal dispositions as well as their constitution and impacts of the resulting violence, especially among women and girls. Baiocchi et al. (2017) contend that GBV in schools is a direct expression of these social hierarchies and inequalities by gender. Ungar (2012) contends that the traditional gender roles emphasized in society promote violence in the sense that they make women and girls look inferior and more prone to violence. In turn, educational systems tend to form and reflect this societal norms in the way they reproduce these processes or challenge them. Fergus and Vant Rood (2013) accentuate the fact that educational systems are to be analyzed in terms of which machineries of gender-based violence are being perpetuated. The relationship between educational policies, gendered violence, and the lived experiences of students in schools can be contextualized through this Theory.

2.1.2 Resilience Theory

Resilience theory focuses on the ability of people to survive and flourish in the face of difficult situations. According to Masten (2001), resilience occurs when an individual remains intact through the hurdles of a problematic scenario, which is of great concern in the present situation regarding how students will manage to perform despite being subjected to GBV. The Theory focuses on the importance of protective factors, including family support, peer relations, and the school climate, in helping students subjected to GBV become resilient. Ungar (2012) and Masten (2018) demonstrate that such factors can moderate the impact of trauma and violence in teaching children so they can continue their studies and remain psychologically fit. In the context of the study, Resilience Theory assisted to comprehend the manner in which the GBV-based trauma is being treated by students in the Bungoma County with attention being given to school-based guidance and counseling processes as one of the essentials to resilience and to enhance scholastic achievements. Baiocchi et al. (2019) allege that learners in their different learning institutions are likely to do well academically provided that there are support facilities in their different learning institutions in spite of the negative consequences of GBV.

Collectively, the Social Feminism Theory and the Resilience Theory may be presented in terms of their ability to provide the full view of the study, where the former could see the social reasons and causes of GBV and the latter could make the personal functions and gears assisting the students in overcoming the described problems. Not only can the theories be used to determine the structural factors behind GBV but can also be used to gain insight in how it is possible to empower the students and make them successful in their studies and psychologically in spite of the battles that they have to endure.

2.2 Empirical Review

The empirical research design employed in the study relies on past literature, which captures gender-based violence in schools especially in the sub-Saharan African region and achievement or failure of respective policies used to overcome these obstacles.

2.2.1 Prevalence and Impact of Gender-Based Violence in Schools

Based on research endeavors, GBV in schools has been found to affect the academic performance and the emotional well-being of students negatively. According Baiocchi et al. (2017), students, especially girls, who encounter GBV tend to record low marks, high incidence of absenteeism, and high rates of dropping out. Chouliara et al. (2020) also support the results, stating that the physical and emotional burden caused by GBV decreases students' focus in the classroom and their engagement in scholastic activities. Emotional pain, which GBV has on individuals, especially sexual violence, has a far-reaching effect on students, thus affecting their learning and socializing capabilities. Another aspect of school-related GBV brought to the fore by UNICEF (2021) is its worldwide prevalence: school-related GBV is one of the primary obstacles to the attainment of education and, in many cases, affects the most vulnerable populations, such as adolescent girls.

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2.2.2 School-Related Gender-Based Violence Policies

The studies have indicated varying outcomes in the optimization of policy frameworks for tackling GBV within schools. Nyoni et al. (2023) studied the barriers to GBV prevention policies in Kenyan schools, especially in rural areas. Indeed, they observed that though the Kenya Gender-Based Violence Act of 2015 and the Children Act of 2001 are good policies, their enforcement presents great challenges. These issues include inadequate resources, insufficient training of school personnel, and limited community knowledge regarding GBV prevention and reporting processes. In line with this, Baiocchi et al. (2017) also reported that most schools within the rural communities are faced with logistical issues (inappropriate reporting mechanisms) that undermine the success of the GBV policies. Women (2016) further emphasized that policy application difficulties are more specific to rural schools, as the resources and infrastructure in these schools are often inadequate to respond effectively to GBV.

2.2.3 Barriers to Effective Policy Implementation

The obstacles to successful policy enforcement about GBV in schools have been well documented. According to Keller et al. (2017), some of the most critical obstacles are cultural resistance, an inadequate reporting system, and the absence of a proper support system for GBV survivors. According to Menaker et al., (2017), it is a cultural practice in most Kenyan societies due to the combination of cultural preconceptions toward gender roles or stigmatizing the motives of sexual violence and gender-based violence, which slows down reporting and limiting intervention. Gatuguta et al. (2018) opined that this fear of reporting GBV rests on the belief that individuals fear being retaliated or retributed, most particularly to the individual girls who may be socially stigmatized. Barasa et al., (2021) also discuss the sense of victim-blaming culture leading to the disproportionately low levels of GBV reporting in school, particularly where learners fear they will not be believed or will receive no effective assistance.

2.2.4 Resilience and Coping Mechanisms

Although GBV causes significant effects to the education performance, some of the references qualify the view that some learners are able to surmount the issues and remain successful in their academic performance. Nyoni et al. (2023) state that the schools with the support systems in place, such as school counseling services and peer networks, are in a better position to assist students in developing resiliency to overcome the GBV trauma. Masten (2001) postulates that resilience is not a trait, but a process which other factors, namely protective factors, enable an individual to break the hardship. Peer support, safe learning environment, guidance and counseling are some of the factors that help to reduce the effects of GBV and help those affected to study within a school setting. As revealed by Baiocchi et al. (2017), the most important point is that students who used such services in the Bungoma County managed to demonstrate the better academic achievements and emotional wellbeing even despite being subjected to the GBV.

2.2.5 Effective Interventions and Support Mechanisms

Interventions within the school-based program as a means to resolve GBV is an essential element of a safer and supportive learning environment. Devries et al. (2015) discuss the effects of local interventions, such as Good School Toolkit, which was tasked with the mitigation of school-based violence via the training of liaisons in the context of teaching teachers, educating the students in the context of violence, and establishing reporting safe avenues. Karanja (2019) mention that schools must be more capable of preventing GBV by providing adequate reporting systems, resources, and psychological support to victims in their work. A general evidence-based perspective that effective schools prevent and respond to GBV because of their excellent anti-violence policy and trauma-informed practice, which culminate in achieving better results academically and staying safe, is put forward by López-Lalinde et al. (2024).

III. METHODOLOGY

3.1 Research Design

The kind of research design that was used in the current research was the mixed-methods design which is a combination of the quantitative and qualitative research methods whereby the researcher was able to evaluate the efficacy of the gender-based violence (GBV) policy framework in the public secondary school in Bungoma County. The objective of the quantitative research was founded on investigating an association of GBV on the academic performance of students, whereas the objective of the qualitative research was founded on the analysis of the impediments to effective prevention of GBV in schools and experiences of the stakeholders on the necessity to prevent GBV at faculty. With such design, one could take a closer inspection of the scale of the problem, as well as the efficiency of the intervening processes (Baiocchi et al., 2017; UNICEF, 2021).

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3.2 Target Population

The targeted population of the research study was that of the students, Guidance and Counseling teachers, and policy makers interested in the problem of prevention and control of GBV in the setting of the public secondary schools in Bungoma County. The base of the population of the study was 184 secondary schools in the state and the number of students in the population was 1,104 students in the province of 250,000 students in the county secondary schools (Kenya National Bureau of Statistics, 2019). It also purposively sampled 184 teachers of Guidance and Counseling, 3 Sub-County Directors of Education and 13 GBV Survivors providing qualitative data.

3.3 Sampling Techniques

The schools were selected using the stratified random sampling method to ensure that there was representation in respect to region (urban, rural) and composition of school (mixed-sex, all-boys, all-girls). The stratification was performed according to the location, size, and type of the schools in order to obtain the balanced sample. The 1,104 students that formed the sample population were chosen among the entire student body in the county and the population was also stratified by sex and geographical location (Krejcie & Morgan, 1970). Through the purposive sampling, key stakeholders such as Guidance and Counseling teachers, Sub-County Education Directors, and GBV survivors were identified since they play a vital role as they have adequate information on the implementation of the GBV policies and its challenges experienced over the process.

3.4 Data Collection Methods

The study used quantitative and qualitative methodologies of data collection to determine the effectiveness of GBV policies in government secondary schools in Bungoma County. The quantitative data was obtained using survey questionnaires administered to students, teachers, and administrators in the form of constructive questions and yes-no questions, along with Likert-scale questions to determine their exposure to GBV, its academic effects, and the effectiveness of the policies. Further, academic records were utilized to observe a relationship between test scores and GBV experiences. Regarding the qualitative data, semi-structured interviews were employed to obtain information on the challenges of implementing policies and support systems of GBV survivors with school administrators and Guidance Counseling teachers. The focus group discussions (FGDs) took students through talks on their experiences with GBV and its impact on their lives. Finally, document reviews on the implementation of schools in accordance with national frameworks on GBV were carried out.

3.5 Data Analysis

The quantitative data collected was analyzed using descriptive statistics such as frequencies, percentages, and means to compute and summarize how common forms of GBV in schools and how it affects academic performances. The Pearson correlation coefficient was applied, which is a statistical tool whose result can be able to draw the inference on the correlation between GBV and academic performance. In addition, the academic performance of different groups of students depending on their gender, type of school, and geographic location was tested by using Analysis of Variance (ANOVA) severally (Baiocchi et al., 2017; Masten, 2018).Thematic analysis was used to define the essential issues that are associated with the experiences of GBV victims, the nature of challenges to the execution of policy, and the efficacy of assistance systems on the basis of qualitative data (interviews, focus group discussions). It employed the utilization of the NVivo software that allowed detecting significant themes which appeared several times; in that way, the qualitative analysis was step-by-step and systematic (Creswell & Creswell, 2017). The content analysis used the document review and though on the applicability of school policies on national frameworks on GBV. This kind of strategy assisted in identifying the lapses in execution of a policy and the ones needing an overhaul (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021).

IV. FINDINGS & DISCUSSION

This section provides the findings of the study that measure the effectiveness of the gender based violence (GBV) policy framework in the context of the public secondary schools in Bungoma County. It discusses the GBV levels, the relationship between GBV experiences and school performance, and the impact of policies directed to the fight against GBV at school. The dataset supporting the findings included both quantitative and qualitative data, document review.

4.1 Prevalence of Gender-Based Violence in Schools

The findings by the research revealed that GBV is rampant among the secondary schools within Bungoma County where so far learners and the staff were victims of GBV. The information on types of GBV and how frequently are they reported by students has been summarized in Table 1 using structured questionnaire questions.

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Table 1

Prevalence of Gender-Based Violence in Bungoma County Schools

Type of GBV	Frequency (%)	Impact on Academic Performance (%)
Physical Assault	45	40
Sexual Harassment	32	60
Psychological Abuse	23	55
Verbal Abuse	15	50
Total GBV Incidents Reported	**92**	

The statistics showed that 45 percent of students had been physically assaulted, 32 percent had had some experience of sexual harassment, 23 percent had been psychologically abused, and 15 percent reported verbal abuse. This prevalence is high, indicating a need to develop effective interventions and implement GBV policies within the school. According to Keller et al. (2017) this violence not only affects the social and emotional health of students but also their academic performance negatively. The present study showed that 60% of students reporting sexual harassment had worse academic performance, which is consistent with more studies in the region (UNICEF, 2021). The relationship between GBV and low academic performance underscores the importance of addressing GBV to promote academic achievement.

4.2 Academic Performance

Academic performance was measured in this study by considering the most recent internal examination scores in percentage form of the students. The findings were presented in Table 2.

Table 2

Descriptive Statistics for Academic Performance

Group	Mean (%)	SD	% Below Pass Mark
Overall	58	10.2	42%
Male students	59	—	—
Female students	57	—	—
Urban schools	62	—	—
Rural schools	55	—	—

Note. SDs and percentages for subgroups were not available; only the overall SD and overall proportion below the pass mark are reported.

Among all respondents, the average mark was 58 percent (SD = 10.2). The male students achieved a slightly better level of mean score (59%) than their female counterparts (57%). Performance also differed depending on the location of the school with urban at 62 percent and rural of 55 percent. About 42 percent of the learners had scored below the minimum 50 percent, which means that a good percentage of the learners were in danger of not achieving. These descriptive outcomes on the key variable under investigation are the foundation of exploring the statistical correlation between assessment and experiences of gender-based violence.

4.3 The Relationship between GBV and Academic Performance

Table 3 presents the statistical dependence between GBV experiences and internal test scores among students. The relationship between GBV and academic performance was also evaluated using the Pearson correlation coefficient, which found a strong correlation.

Table 3

Pearson's Correlation Coefficients between GBV and Academic Performance

Type of GBV	Pearson's r	p-value
Physical Assault	-0.074	0.043
Sexual Harassment	-0.45	0.000
Psychological Abuse	-0.076	0.037
Verbal Abuse	-0.032	0.112

The Pearson correlation coefficient of sexual harassment (-0.45) shows that a moderate negative relationship exists between sexual harassment and academic performance; that is, the more one experiences sexual harassment, the lower the test scores. Studies have confirmed this finding, reporting the psychological impact of GBV that can influence cognitive performance and academic performance (Chouliara et al., 2020). On the same light, physical

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assault (-0.074) and psychological abuse (-0.076) weakly and significantly correlate negatively with academic performance.

According to Masten (2018), negative experiences such as these may lower students' capacity to concentrate on their academic life, although they may also affect their academic results. As stated by one of the teachers, students are not able to concentrate on their work when they become victims of GBV. They cannot easily concentrate or do any assignments as they are living in the trauma." This is in line with the research findings, in which numerous students who faced GBV indicated that they faced trouble focusing and engaging in academic work.

4.4 Effectiveness of GBV Policies

Another factor examined by the research is the efficacy of GBV policies in public secondary schools in Bungoma County. The findings of the semi-structured interviews and focus group discussions revealed serious lapses in the implementation of existing policies.

A rural school Guidance Counselor reported,

> *"Although the policies are there, inefficiencies associated with a lack of training for teachers and staff on how to proceed with a case of GBV has seen many cases being swept under the carpet or dealt with ineffectively."*

This observation also agrees with Keller et al. (2017), who proposed that in majority of the schools, lack of resources and staff has been hindrance to enacting the GBV policies effectively. The other teacher replied,

> *"They just report few cases on some occasions, but the response given by the administration is way too long, and the students also lose their faith in the system."*

Moreover, there was fear and shame when reporting an incidence of GBV elicited by the students. One of the students said as follows:

> *"I have a friend who has been sexual harassed yet she never reported, because she feared what people would say and do about her. "*

This is similar to the research done by Karanja (2019) which came into a conclusion that cultural stigmatization and fear of reprisals are some of the factors that can be used to explain why cases of GBV are mostly not reported by students. These are some of the barriers that have serious implications in the performance of GBV policies in schools.

4.5 Barriers to Policy Implementation

The research was able to identify hindrances to effective implementation of the GBV policies in schools. These were erratic resources, which were not trained in staff, or communities. One of the key challenges that were evident with the data was that there were no safe reporting systems among the students.

According to one of the students,

> *"We do not trust anyone with our ills. We do not believe that there is a safe occupation to exchange thoughts on these issues at all."*

Administrators at school also were interested in mentioning the challenges they had when implementing policies.

According to one SCDE,

> *"We are ready with the policies, but we cannot implement them without preparing our employees about these policies and providing them with the necessary resources. The workers are tried beyond their capacities and are limited in their experience towards handling such sensitive issues."*

This statement concurs with the research of Keller et al. *(*2017), which studies the possible obstacles to adopting policies of GBV in schools. They learned that schools usually are ill equipped to make certain effective implementation of the GBV policy in terms of infrastructure, training, and human resources.

One more school Guidance and Counseling teacher mentioned,

> *"Such polices are hard to apply in cases where the community is not with them. Society needs to engage in the process of changing attitudes towards GBV, but we do not have the authority to conduct any discussions about it regularly".*

This underscores one of the most significant obstacles that the research has uncovered to this challenge: lack of community involvement, and this follows to add more to the difficulty in implementing policies against GBV in schools. This highlights one of the greatest barriers identified in the study: the absence of community participation, which further complicates the enforcement of GBV policies in schools.

The UNESCO (2021) report on the use of GBV frameworks in schools reflects the same problem and mentions that without adequate support facilities, GBV policies do not have essential results. One administrator stated that,

> *"We are on a treadmill of responding cases, and failing to find cases. That is only the beginning, because we should have safe zones and fitted staff."*

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The presence of such obstacles proves the need to devote even more resources, train staff, and mobilization of the community to implement the given policy in the easiest and most efficient way possible in order to support students who are victims of GBV in the most effective manner.

4.6 Support Systems for GBV Survivors

Despite the existence of policies, it was determined that the support system of GBV survivors is inadequate. Majority of students also reported that there was lack of guidance and counseling as no one had been trained and there were no facilities.

One of the counseling teachers stated,

> *"There are too many cases and we simply do not have enough of employees/trainers to help every student who approaches us."*

This observation aligns with the results of the study by Karanja (2019). that guidance counselors working in the rural setting tend to be poorly trained to assist GBV survivors. There are also minimal external support services including legal services and medical services available to students which worsen the conditions of the GBV survivors.

One of the survivors added,

> *"After I went out to report the abuse, no one helped me to seek medical attention or help me to find a lawyer. I was abandoned."*

This absence of support services is an indication that there is a problem with regard to offering adequate training and resources to provide effective counseling to the survivors.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

In this research project, it was studied how gender-based violence (GBV) policy may enhance academic achievement in the public secondary schools in Bungoma County based on the following objectives: to ascertain the morbidity of GBV; to ascertain the effect of GBV on academic achievement; and to ascertain the effectiveness of interventions that are available. Its findings had a high percentage of GBV prevalence, but the violence acts that were most prevalent included physical assault, sexual harassment and psychological abuse by the students. The significant impact of GBV on the academic performance of students was established because GBV influenced the ability of students to focus, attend classroom learning, and show good results in internal examinations. Additionally, the implementation of the GBV policies incurred significant gaps primarily in the rural schools where resources were not available, staffs were not thoroughly trained, and community integration was inexistent, thereby, causing another significant barrier to the effective implementation of the policy. However, the study also indicated that some improvement can be done through the availability of better support networks and the adoption of good policies.

5.2 Recommendations

To begin with, schools can be encouraged to provide regular trainings on their staff and teaching faculty so as to become more competent in responding and solving the cases of GBV. This training will focus on the provision of the right responses, provide support to those who have experienced the violence, and be knowledgeable on GBV signs. Also, the creation of a secure and anonymous reporting system among students is essential. These systems need to be free, unattributable, and courageous. An idea that could be suggested to make reporting process more effective is to consider the introduction of online channels or anonymous reporting systems, which would enable students to request help without being concerned about social stigmatization.

Community involvement is another key area that requires amendments. GBV awareness should be augmented by local leaders, parents, and the community organizations in collaboration with schools to have a unified approach to GBV. The negative gender norms may be disrupted through awareness campaigns and workshops, and establish a culture of non-violence and support to GBV survivors. GBV policies would become successful to a large extent because of community participation.

In addition, the right resources should be allocated to check whether measures related to GBV policies are being applied effectively. Schools should be financed to employ specialist staff, trained counselors, and lawyers in order to provide a broad range of support to victims and survivors of GBV. These would affect enhancing how the policy is implemented and guarantee that reviews of GBV cases are dealt with immediately effectively. Lastly, trauma-informed care is an essential practice in schools. Some of the crucial areas that schools must pay attention to in that regard are: provision of counseling services and establishment of clear pathways to medical and legal aid to GBV survivors. This kind of healthy support system would help the students recover the trauma of violence and re-establish their academic abilities. By implementing these recommendations, schools in the Bungoma County can achieve a safer and more supportive learning environment to all students, thus enhancing academic improvement and reducing GBV rates.

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REFERENCES

Baiocchi, M., Friedberg, R., Rosenman, E., Amuyunzu-Nyamongo, M., Oguda, G., Otieno, D., & Sarnquist, C. (2019). Prevalence and risk factors for sexual assault among class 6 female students in unplanned settlements of Nairobi, Kenya: Baseline analysis from the IMPower & Sources of Strength cluster randomized controlled trial. *PLoS ONE, 14*(6), e0213359.

Baiocchi, M., Omondi, B., Langat, N., Boothroyd, D. B., Sinclair, J., Pavia, L., Mulinge, M., Githua, O., Golden, N. H., & Sarnquist, C. (2017). A Behavior-Based Intervention That Prevents Sexual Assault: the Results of a Matched-Pairs, Cluster-Randomized Study in Nairobi, Kenya. *Prevention science : the official journal of the Society for Prevention Research*, *18*(7), 818–827. https://doi.org/10.1007/s11121-016-0701-0

Barasa, S. F., Wamue-Ngare, G., & Wanjama, L. (2021). Experience of school-related gender-based violence by pupils and the culture of silence: A case of primary schools in Kasarani District, Nairobi County, Kenya. *International Journal of Business and Management, 1*(1), 70–95.

Chouliara, Z., Karatzias, T., Gullone, A., Ferguson, S., Cosgrove, K., & Burke Draucker, C. (2020). Therapeutic change in group therapy for interpersonal trauma: A relational framework for research and clinical practice. *Journal of Interpersonal Violence*, *35*(15–16), 2897–2916.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage Publications.

Devries, K. M., Knight, L., Child, J. C., Mirembe, A., Nakuti, J., Jones, R., Sturgess, J., Allen, E., Kyegombe, N., Parkes, J., Walakira, E., Elbourne, D., Watts, C., & Naker, D. (2015). The Good School Toolkit for reducing physical violence from school staff to primary school students: A cluster-randomised controlled trial in Uganda. *The Lancet Global Health, 3*(7), e378–e386. https://doi.org/10.1016/S2214-109X(15)00060-1

Fergus, L., & Van't Rood, R. (2013). *Unlocking the potential for change: Education and prevention of gender-based violence* (Sida consultancy report).

Gatuguta, A., Merrill, K. G., Colombini, M., Soremekun, S., Seeley, J., Mwanzo, I., & Devries, K. (2018). Missed treatment opportunities and barriers to comprehensive treatment for sexual violence survivors in Kenya: A mixed methods study. *BMC Public Health, 18*(1), 769.

Karanja, D. N. (2019). Effects of domestic violence on students' academic performance in public day secondary schools in Tetu Sub County, Nyeri County, Kenya (Doctoral dissertation, University of Nairobi).

Keller, J., Mboya, B. O., Sinclair, J., Githua, O. W., Mulinge, M., Bergholz, L., Paiva, L., Golden, N. H., & Kapphahn, C. (2017). A 6-week school curriculum improves boys' attitudes and behaviors related to gender-based violence in Kenya. *Journal of Interpersonal Violence, 32*(4), 535–557. https://doi.org/10.1177/0886260515586367

Kenya National Bureau of Statistics. (2019). *2019 Kenya population and housing census: Population by county and sub-county Volume 1*. Kenya National Bureau of Statistics.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308

López-Lalinde, L., Kozak, M., Muluve, E., Wafubwa, R. N., & Soler-Hampejsek, E. (2024). The state of gender and education needs in Kenya: The missing step toward gender equity (Kenya Gender and Education Roadmap, Brief No. 1). EGER, Population Council.

Masten, A. S. (2001). Ordinary magic: Resilience processes in development. *American Psychologist*, *56*(3), 227–238.

Masten, A. S. (2018). *Ordinary magic: Resilience in development* (2nd ed.). The Guilford Press.

Menaker, T. A., Campbell, B. A., & Wells, W. (2017). The use of forensic evidence in sexual assault investigations: Perceptions of sex crimes investigators. *Violence Against Women*, *23*(4), 399–425.

Njoroge, A. B. (2010). The impact of gender based violence on girl child education in Kinango District, Kenya (Doctoral dissertation, University of Nairobi).

Nyakundi, S. M. (2018). Effects of gender based violence on academic performance among university students: A case of Daystar University, Nairobi County-Kenya (Master's thesis, Daystar University, Kenya).

Nyoni, T., Steiner, J. J., Okumu, M., Orwenyo, E., Tonui, B. C., Lipsey, K., & Mengo, C. (2023). The use and effectiveness of the whole school approach in school-based interventions addressing gender-based violence in sub-Saharan Africa: A systematic review. *Trauma, Violence, & Abuse, 24*(5), 3615–3628.

UN Women. (2016). *Global guidance on addressing school-related gender-based violence*. UNESCO Publishing.

UNESCO. (2021). *Behind the numbers: Ending school violence and bullying – 2021 edition*. United Nations Educational, Scientific, and Cultural Organization. https://unesdoc.unesco.org/ark:/48223/pf0000379174

Ungar, M. (2012). *The social ecology of resilience: A handbook of theory and practice*. Springer.

UNICEF. (2021). *Ending violence in schools: An investment case*. https://www.unicef.org/reports/ending-violence-schools-investment-case-2021

Licensed Under Creative Commons Attribution (CC BY-NC)

Yates, J., Nagra, R., & Mantler, T. (2024). “It was kind of like everything was hitting rock bottom all at once”: The impacts of gender-based violence on undergraduate student academic success. *Journal of College Student Retention: Research, Theory & Practice, 5*(5), 45–49. https://doi.org/10.1177/15210251241289910

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The challenges experienced by integrity clubs in public secondary schools in Nairobi City County, Kenya

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ABSTRACT

In Kenya, the Ethics and Anti-Corruption Commission (EACC) launched Integrity Clubs (ICs) in secondary schools in 2011 to teach students moral values and promote ethical behavior. Despite this, indiscipline and moral challenges have been found in most of the public secondary schools in Nairobi City County to continue to pull down the success of these clubs. Behavioral theory leading the study inspired the research by focusing on reinforcement and environmental factors contributing to the development of behavior to understand the ways Integrity Clubs can or cannot foster moral values. A convergent parallel mixed methods design was used, and the focus was on students, teachers, principals, and the Ministry of Education, as well as EACC officers, and a total of 448 respondents were sampled using the convergent parallel mixed methods design. The sampling of students was stratified random, whereas the planned population was the administrators and policymakers, who were purposively sampled. The methods of collecting data included questionnaires, interviews, focus group discussion, and document analysis. Descriptive and inferential statistics using SPSS version 25 were performed on quantitative data, and qualitative data were subjected to thematic analysis. The results demonstrated that ICs have the potential to affect ethical conduct positively by means of debate, mentorship, and value-based campaigns but are limited by ineffective administrative support, static strategies to reinforce the initiative, unorganized programming, and scantiness of resources. The participation was also negatively affected by low student motivation, peer pressure, and external socio-economic influences. At the end of the study, it is concluded that the success of the ICs is conditional upon consistent reinforcement, institutional commitment, sufficient facilitation, and active stakeholder participation. The policy suggestions involve the organized introduction of IC activities within school culture, improved training and engagement of club patrons, and improved resource proportions to maintain behavioral reinforcement strategies. These results can be used to form guidelines on education policy, as well as a follow-up in promoting the need for value-based learning in tackling moral decay among the Kenyan youth.

Keywords: Convergent Parallel, Ethical Behavior, Integrity Clubs, Moral Values, Ministry of Education, Resource Constraints, Behavioral Theory

I. INTRODUCTION

The issue of moral decadence and the increased cases of indiscipline in secondary schools is a long-standing issue in Kenya and in the rest of the world. Since learners are going through the adolescent part of their life which is a crucial phase of building identity and character, the school setting is supposed to foster not only cognitive but also ethical and moral awareness. In that regard, Integrity Clubs have become an important non-formal tool of instilling the values of honesty, responsibility, patriotism and accountability among the students (EACC, 2013). Officially launched in Kenya in 2011 by the Ethics and Anti-Corruption Commission (EACC), these clubs were conceived as co-curricular projects aimed at the moral education of school children by encouraging them to behave ethically and to practice good governance through youth-led action and reflection. The efficiency and the working capacity of these clubs are still under question in spite of the good intentions. The students in the Nairobi City County, which is the educational and capital city of Kenya, are of different socio-economic, ethnic, and religious backgrounds. This has caused an elevated susceptibility to social vices like cyberbullying, drug abuse, exam malpractice, and disrespect to authority, among others due to this diversity and several complexities of urban life (United Nations Scientific, Environmental and Cultural Organization [UNESCO], 2021; Chang, 2010). In this way, Nairobi offers an interesting argument to evaluate the practical issues that Integrity Clubs in the public secondary schools have to deal with.

Although more than 2,000 Integrity Clubs had been established in the country by 2018, the EACC revealed that only 43 percent of them were active with organized activities, and most of them were not facilitated by teachers or

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supported by the administration (EACC, 2018). Student unrest, vandalism and defiance cases are on the increase in Nairobi. As an example, Nairobi City County alone experienced more than 16 cases of student-led unrest and school strikes and property destruction between 2019 and 2022 alone (Ministry of Education, 2022). Such incidences indicate the possible discrepancy between the intended purpose of Integrity Clubs and their effect on the ground. This requires an examination of the obstacles that negatively affect their successful implementation and impact. The use of ethics clubs based on students to curb indiscipline among students has become popular internationally. As an example, Integrity Clubs in South Africa are a development of peer mediation models, aiming at enhancing the social skills of students and their ethical behavior (United Nations Children Fund [UNICEF], 2013). Likewise, the Integrity Clubs model has also resulted in the decrease of school violence and the increase of student accountability in Cote d Ivoire where it is well supported (Fiske, 2008). But these models also cite the problems of poor training, poor leadership and lack of resources- similar to the Kenyan settings.

In Kenya, school dynamics including leadership attitudes, teacher facilitation, resource allocation and the overall culture of the learning institution are the factors that determine the implementation of Integrity Clubs. Nwikina and Nwile (2013) discovered that in cases where the school leadership supported the Integrity Clubs and incorporated them in the school culture, there was a sharp drop in exam cheating and other indiscipline cases. Nevertheless, in the schools where the club activities were sidelined, the integrity education was formal and, in most cases, it was a name only. The absence of structured programming, training of teachers, and clubs time distribution were found to be the major barriers (Nwikina & Nwile, 2013); EACC, 2018). These problems are further aggravated by other urban related problems in the Nairobi City County. Most schools are under pressure of high enrolment, poor infrastructure, and poor teacher-to-pupil ratios, and thus there is no much room to support long-term extracurricular activities.

Muthuuri (2022). found that 32 percent of the secondary schools in Nairobi had at least one severe case of indiscipline per term, which begs the question of whether the current ethical education systems are effective. In addition, Nairobi students are being exposed more and more to the modern ethical issues like dishonesty through digital media, exposure to violent media content, and peer pressure enhanced by social media. Although Integrity Clubs are supposed to be the safe environments where students can discuss and clarify their values, their involvement is usually compromised by the academic pressures, the ambiguous club missions, and the absence of rewards. The teachers and patrons have complained of the inability to maintain the interest and the commitment of the students, particularly when the clubs are not given institutional priorities or are not scheduled.

There is also the influence of administrative buy-in and policy enforcement on club functionality. In most schools, the guidelines of EACC are not followed through since there are no monitoring systems, club patrons are not trained enough, and the significance of values-based co-curricular participation is simply underestimated. This apathy on the part of administration does not allow uniformity in the implementation of clubs across schools, thus causing differences in the difference in club impact. The potential of Integrity Clubs to transform is seriously hampered without system-wide commitment. Based on the foregoing, it is clear that though the Integrity Clubs are very promising as a means of inculcating moral values in students, they are faced with systemic, institutional and socio-cultural issues that undermine their efficiency. The policy-practice gap still exists, and without empirical research, it is hard to tell what exactly prevents these clubs to work in the Nairobi situation in the best way possible. The scenario is also worsened by the fact that there is lack of research on the structural, operational and behavioural issues that these clubs encounter in urban public schools. Although the policy discourse surrounding Integrity Clubs is largely positive, the lack of evaluative research leaves a gap, which policymakers, educators, and the EACC can hardly fill with evidence-based changes. This research thus aims at addressing this gap by zeroing on this issue as faced by the Integrity Clubs in the public secondary schools within Nairobi City County, Kenya. This study will be able to unpack the barriers to club success by evaluating the presence of issues like teacher facilitation, administrative support, student engagement, resource availability and club visibility within schools. The insights that will be developed will be useful in informing future interventions that will enhance the role of Integrity Clubs in developing ethical, value-driven youth in Nairobi and other parts of the country.

1.1 Problem of the Statement

Although the Kenyan government has been keen on institutionalizing Integrity Clubs in secondary schools since the year 2011 through the Ethics and Anti-Corruption Commission (EACC), incidences of indiscipline, moral decay, and unethical student behaviour continue to be reported in most institutions. Cases of student riots, strikes, drug abuse, theft and examination cheating have been reported in the Nairobi City County, which implies that moral programs such as Integrity Clubs are not operating at their best. As an example, the Ministry of Education (2022) recorded more than sixteen instances of student-led unrest over the last three years (2019-2022), whereas the Teachers Service Commission (2021) indicated that 32 percent of all the public secondary schools have significant behavioural infractions per term. The above alarming statistics raise concerns about the effectiveness and efficiency of the Integrity Clubs, particularly in the context of Nairobi, which is a unique urban and multicultural environment. There is

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emerging evidence that although Integrity Clubs are a well-intended idea, the implementation of the same has been associated with a lot of structural, administrative and operational difficulties. The EACC (2018) indicated that despite having over 2,000 clubs established in the country, only 43 percent of them were said to be active and most of them were characterized by the absence of teacher facilitation, lack of funding, little administrative support, and integration into the school culture. The role of students in behavioural influence is further undermined by poor attendance and little knowledge of the purpose of the club. Other schools use Integrity Clubs as a ceremonial and not a practical platform, and others have no trained patrons or organized activities that correspond with the real-life experiences of the students. This is unequal application that weakens the transformative power of the clubs and causes lost opportunities in value-based education. That being the case, the need to question the nature of challenges that Integrity Clubs encounter in the Nairobi City County public secondary schools can no longer be ignored. The county is a special case as it is socio-economically diverse, has a high digital exposure to students, and has increased publicity of student misconduct in the media. Unless there is the empirical understanding of the structural impediments, operational inefficiencies, and contextual constraints that plague these clubs, stakeholders such as school administrators, the EACC, and education policymakers are not in a position to make informed decisions to enhance their functionality. It is in this light that this study shall seek to address this gap by examining the nature and magnitude of obstacles that impede Integrity Clubs in an attempt to come up with practical recommendations that can be used in enhancing moral education systems within city schools in Kenya.

1.2 Research Objective

To examine the challenges experienced by integrity clubs in public secondary schools in Nairobi City County, Kenya

II. LITERATURE REVIEW

2.1 Theoretical Review

The Behavioral Theory which was proposed by such theorists as B.F. Skinner argues that human behaviour is acquired in the course of interaction with the environment, especially through the reinforcement and punishment processes. Within the framework of the present study, the theory serves as a source of knowledge about the process of students learning and demonstrating such values as integrity, responsibility, and honesty due to their involvement in the activities of Integrity Club. These clubs are trying to influence the behaviour of the students by developing an atmosphere which supports ethical behaviour and discourages moral deviance. When a good moral behaviour is rewarded, e.g. being rewarded when one is honest or when one leads others, students tend to do the same behaviour again (Skinner, 1953).

In this study, the Behavioural Theory is used to examine how the issues that face Integrity Clubs can interfere with or undermine the reinforcement mechanisms that are needed to bring about positive behavioural change. As an example, the positive reinforcement of moral behaviour that is expected due to Integrity Club activities may not be realised when there is no consistency in the activities, when the activities are not well facilitated or when there is no administrative support. Rather, they might be getting mixed signals in their surroundings, including witnessing the teachers or administrators behaving against the principles of the club, which negatively affects the learning process (EACC, 2018; Walczak, et al., 2010). Such contradictions prevent internalization of moral behaviours that the clubs are supposed to develop.

Moreover, Behavioural Theory can be used to explain the reason why Integrity Clubs achieve better results in some schools than others. The theory states that behaviours are affected by the immediate situation, such as peer modelling and accessibility to structured activities. Accordingly, the issues of untrained facilitators, insufficient time, or inadequate student involvement restrict the environmental stimuli to support the desired behaviours. Without them, students will not repeat or appreciate the ethical behaviours that are being encouraged (Cinar, 2019; UNESCO, 2005). The theory therefore advocates the study of how these environmental shortages contribute to poor behavioural performance of students.

Finally, the theory is also used in directing interventions. This study will be able to suggest measures that can be taken to correct the situation in the operation of Integrity Clubs by determining which reinforcement mechanisms are not used or misused in the operation of the clubs. As a case in point, praise, systematic rewards, or peer-based recognition may support the motivation and involvement of students. Also, the negative reinforcement that students might face, i.e., being mocked at when participating in clubs or not being supported by the teachers, can be addressed to prevent the obstacles to ethical behaviour. It follows that Behavioural Theory provides an effective perspective not only through which the challenges affecting Integrity Clubs may be examined but also through which practical recommendations may be made based on the principles of behaviour modification (EACC, 2013; Zulela, et al. (2022).

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2.2 Empirical Review

2.2.1 Challenges ICs Face in Schools

Despite their significant role in promoting ethical values and shaping the moral behavior of students, Integrity Clubs (ICs) face several challenges that hinder their effectiveness. One of the most pressing constraints is inadequate funding. Many public secondary schools operate under limited budgets that prioritize academic performance and infrastructural needs, leaving co-curricular programs like ICs underfunded (Mugambi, 2022). Without sufficient financial support, ICs struggle to organize essential activities such as seminars, workshops, outreach programs, and integrity awareness campaigns; initiatives that are crucial for instilling values of transparency, honesty, and civic responsibility among students (EACC, 2013). Furthermore, schools often do not allocate resources for activities conducted outside the classroom setting, as academic achievement remains the central focus of most institutions .

Another major challenge affecting the functionality of ICs is the low level of student participation. Since Integrity Club activities are typically voluntary and lack immediate extrinsic rewards such as grades, certificates, or scholarships, students may perceive them as less valuable compared to academic pursuits (Caravita et al., 2014). As a result, participation is often limited to a few committed individuals, while others may be demotivated by the lack of recognition or tangible incentives. Without structured support systems or acknowledgment, students who demonstrate ethical behavior through ICs may feel undervalued, which ultimately reduces long-term engagement. A potential solution is the introduction of reward mechanisms, such as certificates of merit, leadership recognition, or academic credits for civic engagement, which can incentivize participation and reinforce the importance of ethical behavior (Peck et al., 2016).

Additionally, peer pressure and negative societal influences present considerable obstacles to the success of ICs. In environments where unethical behavior such as cheating, favoritism, and dishonesty is normalized, students who attempt to uphold integrity may face ridicule or social isolation (Teachers Service Commission [TSC], 2021). Peer disapproval can deter students from participating in ICs, especially when moral conduct is viewed as unpopular or unrewarded. Furthermore, the broader societal culture often undermines the values promoted by Integrity Clubs. The frequent exposure to public scandals involving corruption, embezzlement, and unethical leadership in Kenya can create a cognitive dissonance among students, making them question the utility of upholding moral standards when such behavior is seemingly unrewarded in adult society.

To overcome these challenges, schools must institutionalize support for ICs through deliberate policy integration and active administrative involvement. This includes budgetary allocations for IC programs, embedding ethics education within the formal curriculum, and creating mentorship opportunities with morally upright community members who can serve as role models (Mnistry of Education, 2022). Equally, schools should implement positive reinforcement strategies, such as public recognition and school-wide celebrations of ethical conduct, to affirm the importance of values-based education. By addressing the financial, motivational, and cultural barriers to participation, ICs can be better positioned to fulfill their mission of nurturing responsible, principled, and civically engaged students.

III. METHODOLOGY

3.1 Design of the Study

The research study utilized convergent parallel mixed methods research design which allowed the researcher to gather both quantitative and qualitative data at the same time and yet analyze the data separately followed by such integration of the findings (Cohen & Manion, 2000; Creswell & Clark, 2011). The decision to use this design was provided by the statement of the purpose of the study: to examine the challenges to Integrity Clubs (ICs) in the Nairobi City County secondary schools. Student-provided quantitative data gave measurable patterns on the barriers of participation, and the qualitative knowledge obtained by talking to teachers, principals, and EACC officials offered more insight into instinctual and cultural barriers. The design was thus appropriate given that triangulation was possible and that a more comprehensive picture of the intricate factors that present challenges to the effectiveness of ICs would be met (Creswell, 2014).

3.2 Location of the Study

The research was carried out in Nairobi City County; a place that was chosen because of its cosmopolitan character and because it is the pilot area of the establishment of integrity clubs in Kenya. The variety of schools in Nairobi, in terms of socioeconomic factors, exposure to the real-world issues like digital ethics, peer pressure, and indiscipline, among others, made it a perfect environment to evaluate the real issues facing the implementation of Integrity Clubs. Student unrest, drug abuse and examination malpractices are also very high in the city and this was a good background to assessing the operational challenges and constraints of the clubs (Mugambi, 2022).

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3.3 Sample Size and Sampling Procedure

The sampling method employed was multi-stage whereby stratified, purposive and simple random sampling were used to make it representative. The stratification of public secondary schools was done by sub-counties and five sub-counties were purposively selected according to the existence of active Integrity Clubs, and disciplinary issues. At these sub-counties, the schools were sampled randomly and key informants like principals, club patrons, and EACC officials were identified purposefully. The total sample of 448 respondents was selected, 382 students, and 66 stakeholders. This sampling plan made the study to cover a wide range of experiences and views on the issues that constrained the effectiveness of Integrity Club in Nairobi (Mugambi, 2022).

3.4 Instruments of Data Collection

The research applied a combination of questionnaires, key informant interview schedules, focus group discussion guides, and document analysis instruments. The survey questionnaire on students was based on the perceived effectiveness and functional challenges of Integrity Clubs. Structural, administrative and contextual barriers such as poor support, training, and resources were discussed in key informant interviews with education officers and school administrators. The lived experiences of students given by FGDs pointed out internal club processes of uneven attendance and peer indifference. Further, the analysis of documents of Integrity Club documents, policy circulars, and school reports were used to supplement primary data to increase reliability and depth (Mugambi, 2022).

3.5 Analysis of Data

Both quantitative and qualitative analysis was used to analyse the collected data. The SPSS Version 25.0 was used to analyze quantitative data in the questionnaires where frequencies, means, and percentages were calculated to determine the prevalence and the nature of the challenges experienced. The relationships between club participation and perceived barriers were evaluated with the help of inferential statistics, such as chi-square tests.

IV. FINDINGS & DISCUSSION

4.1 Challenges Facing integrity Clubs in Public Secondary Schools

4.1.1 Frequency Analysis of Challenges

Table 1 provides a frequency distribution of the various challenges encountered during the implementation of Integrity Clubs in public secondary schools, highlighting the most commonly reported obstacles faced by these initiatives.

Table 1

Implementation Challenges Frequency Distribution

Challenge Category	Frequency	Percentage	Rank
Lack of awareness	127	34.1	1
Limited teacher involvement	98	26.3	2
Insufficient resources	89	23.9	3
Academic workload conflicts	76	20.4	4
Weak administrative support	71	19.1	5
Poor infrastructure	54	14.5	6
Lack of student interest	47	12.6	7

The frequency analysis of implementation challenges in Table 1 identifies lack of awareness as the most prevalent barrier, affecting 34.1% of respondents. This finding aligns with the correlation analysis showing awareness as a strong predictor of participation. Limited teacher involvement emerges as the second most significant challenge at 26.3%, consistent with the moderate correlation between teacher support and student participation. Insufficient resources rank third at 23.9%, highlighting the material constraints facing many schools. Academic workload conflicts affect 20.4% of respondents, supporting the negative correlation observed between academic pressures and participation. The ranking pattern suggests that programmatic and human resource challenges outweigh physical infrastructure limitations, indicating that solutions should focus primarily on awareness-building, teacher engagement, and resource allocation rather than facility improvements.

4.1.2 Severity Rating of Challenges

Table 2 presents the mean severity ratings of the implementation challenges faced by Integrity Clubs in public secondary schools, offering insight into which challenges are perceived as most significant by respondents.

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Table 2

Mean Severity Ratings of Implementation Challenges

Challenge	Mean Severity	SD	95% CI
Lack of awareness	4.12	0.89	[4.03, 4.21]
Limited teacher involvement	3.94	0.95	[3.84, 4.04]
Insufficient resources	3.87	1.02	[3.76, 3.98]
Academic workload conflicts	3.73	1.08	[3.62, 3.84]
Weak administrative support	3.68	1.14	[3.56, 3.80]

The severity ratings in Table 2 confirm that the most frequently reported challenges are also perceived as most severe. Lack of awareness receives the highest severity rating (M = 4.12, SD = 0.89), indicating that this challenge is both widespread and problematic. Limited teacher involvement follows closely (M = 3.94, SD = 0.95), emphasizing the critical role of educator engagement in program success. The Friedman test confirms significant differences in perceived severity across challenges ($\chi^2 = 67.84$, df = 4, $p < 0.001$). The narrow confidence intervals for all severity ratings indicate reliable estimates with adequate precision. The consistency between frequency rankings and severity ratings strengthens the validity of these findings and provides clear priorities for intervention efforts.

While well-structured ICs had positive effects on students' behaviour, there were challenges that hindered their optimal operation. Some schools did not have sufficient resources to maintain club activities, leading to infrequent or lesser number of meetings. ICs that are well supported financially and logistically by internal and external stakeholders such as the school administration, teachers and government agencies, are likely to be more sustainable. This assertion is consistent with the suggestion by Muthuuri (2022) who opined that values based education programmes have to be financially invested for them to be successful. With insufficient funds, schools do not have the resources to set up successful Integrity Club activities that have the ability to change the behavioural habits of their students.

There were also observed variations on how implementation was being done in different school environments. For instance, some schools implemented a structured approach where there were designated teacher coordinators and specific activities are scheduled while some other schools promoted ICs as optional and this resulted into non-consistent participation. The argument by Mugambi (2022) is replicated in this inconsistency, as he argued that value-based education programs, without institutional commitment may not go to the intended results. In addition, the study also indicated that student ownership in organizing events provides a boost towards the effectiveness of Integrity Club activities in schools.

In addition, students found some of the ICs redundant and apolitical, removed from their academic goals. The club activities were expected to supplement formal education, yet some students did not view the participation as being directly linked to their future career aspirations. This is in line with TSC (2021) who concludes that students are encouraged to engage in co-curricular activities when there is tangible reward, observed in case of academic rewards or advancement of career. Many schools began to integrate Integrity Discourse discussions into classroom settings, linking students into an opportunity for student leadership.

On the other hand, inadequate facilities and too few staff to monitor club activity as well as competing demands discouraged students to join the club. Ministry of Education (2022) argues that there are strong relationships between institutional resources and students' participation in co-curricular programmes. Targeted interventions like teacher training, bolstered infrastructure and deliberate student engagement efforts need to be implemented to address such challenges.

There was another major challenge of the lack of knowledge among students. Low participation rates were caused in some schools where students were not given information that ICs existed or why they should join. This was especially true in schools where school-based club activities were not in the general school curriculum. ICs were also a related challenge because students perceived that the Clubs were inappropriate for pursuing academic and career goals. However, some students did not consider club activities necessary, so fewer students participated.

ICs were also affected by external influences. ICs sometimes conflicted with the values embodied in such things as societal norms, peer pressure, or an examination focused academic system. However, many of the students had difficulty using Integrity Club teachings in the university context where ethical behaviour was not reinforced. In addition, schools had limited financial resources, which hindered them in running such meaningful Integrity Club activities. With the reduced funds earned by the schools, initiatives aimed at club activities, could not sustain and this was followed by irregular meetings and declining maximum student involvement.

It was a lack of awareness that greatly limited students' participation and engagement. In line with Peck et al. (2016), these findings support the idea that the success of extracurriculars depends on the practitioners' pricing and student-led efforts. The better engagement that Intervention Clubs had when both schools and clubs had implemented robust awareness campaigns is evidence of the power of visibility in boosting the integrity club's participation rate.

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The limited involvement of teachers in Integrity Club activities constituted another important challenge. A mean score of 0.10 (SD = 0.32) indicated that teacher participation was very low in this study. In line with what Muthuuri (2022) contended that teacher engagement is a significant factor in promoting the moral education programs. A more structured and effective program was facilitated by teachers who actively supported the Integrity Club discussion and mentored the students. Nevertheless, as in many schools, teachers gave more weight to academic subjects than the extracurricular activities such as ICs, leaving a completely inconsistent and poor leadership and guidance within ICs. The institutional support was weak as the clubs were without adequate mentorship and motivation to participate and the viability of the club as an institution for co-curricular learning was weakened.

Student participation was both influenced and influenced negatively by peer influence. Some students joined an Integrity Club after peer encouragement that such learning was important, while others refused to join because of negative peer pressure. In some schools, joining Integrity Club put Social stigma on students who joined and perceived members as over obedient or rule following. The results of Mugambi (2022) are supported by this finding in relation to the role of social dynamics in dictating student engagement in moral education programs. Best performing schools that had a culture in which membership to the Integrity Club was these respected and observed higher levels of student engagement.

The competing academic workload also acted as another huge barrier, as they did not want to participate to the fullest in Integrity Club activities. Students stated that they had chosen to place more emphasis on academics and academic preparation, because club meetings, they felt were time consuming, and taken up too much time. This supports Ministry of Education (2022) observation that students tend to disregard extracurricular programs when they do not perceive any direct academic advantage. Integrating Integrity Club themes into parts of the school curriculum such as civic education and social studies made for better participation, as the students enjoyed having to choose between club activities and their classroom responsibilities.

Moreover, the ICs success was in part linked to administrative support. Besides purely blanketing campuses, schools where administrators enthusiastically ‘sold’ Integrity Club to staff and promoted it on campus, able to provide access to and flexibility with venues, noted higher levels of student participation. However, in schools that did not place high priority on the ICs, the programs were not structured, therefore, participant inconsistency ensued. The finding that Isomursu et al. (2011) substantiates is that school leadership is an important variable in sustaining extracurricular programs.

Other schools also experienced difficulties involving perceived inappropriateness by students of the activities of Integrity Club with regard to their aspirations for the future. Club discussions on ethical principles were often asked if they played any role in their career and personal ambitions. This agrees with Mugambi (2022), who discovered that students are more inclined to engage in extracurricular activities when there is a direct relationship between them and further success. Schools whose Integrity Club activities were anchored to leadership training, career development and scholarship opportunities attracted better student interest and the students were more committed.

In addition, it uncovered differences in participants of Integrity Club in urban and rural schools. Participation rates were higher in urban schools due to better access to resources, guest speakers, and structured club programing. On the other hand, rural schools had the problems with the lack of trained teachers to monitor club activities, limited access to educational material, as well as limited partners from the outside. The findings in this paper are in line with the results of Mugambi (2022) that resource disparity significantly affects the effectiveness of values education program. Targeted interventions could address these rural urban discrepancies within the scope of a program geared to improve ICs' sustainability according to geographical locations.

Finally, ICs have their own challenges, including low awareness about them, low participation of teachers, financial cramps, peer pressures, academics workload, administrative support problems, and disparity between urban and rural schools. These challenges must be addressed using a multi-faceted approach, first by creating awareness campaigns, like structured teacher involvement, increased funding, and incorporation of Integrity Club themes into academic subjects. These strategies will likely bring greater student engagement for schools adopting them, which will keep ICs sustainable and impactful in schools in fostering ethical development in secondary students. The students, teachers, and school administrators were not aware of the problem. (20) respondents either did not know that ICs existed in their schools or did not know the goals of such clubs. Such lack of awareness really inhibited a student’s participation and enjoyment of the lesson. This study is in concordance with Muthuuri (2022) highlighting that most extracurricular programs work efficiently when they regularly advertise and students do the actual engagement as actives. Awareness campaigns associated with great visibility during implementation resulted in better participation rates, highlighting the critical role of visibility in shaping Integrity Club’s overall participation.

The teachers did not participate in the activities of Integrity Club much either. Only 4 (0.10, SD = 0.32) of the 402 participants in the study participated as teachers. These accords with TSC (2021) where he asserted that teacher engagement is important in enhancing moral education programmes. An overview was made in Teachers, but they were the ones who actively facilitated ICs discussions and mentored in these discussions. Nevertheless, in most

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schools, teachers thought about teaching academic subjects and extracurricular activities such as ICs, which was done with varying leadership and guidance. The institutional support that would have made the clubs as a whole more effective was missing, leaving students without proper mentorship and motivation to be active in the clubs.

For ICs to ensure their sustainability, a multilayered approach that covers structural, financial, and engagement-related challenges needs to be taken. Strengthening awareness campaigns is proven to be one of the most strategic methods to increase sustainability. The existence or importance of ICs is not widely known by many students and teachers, limiting the number of students and teachers participating and the impact. Schools that created digital platforms called on the integrity of their administrations and students to recreate the ICs and those creative schools reported higher levels of engagement. This finding was supported by UNICEF (2013), which mentioned that values education needs to be holistic and integrated in various extra and extra-curricular aspects of school culture rather than being regarded as a separate extracurricular programme.

Another important issue in facilitating club sustainability is enhancing teacher involvement. According to UNESCO (2021), the research has shown that when such training is given to teachers on values education, they are more likely to interrelate with the students skillfully in the extracurricular programs than they are without the training. According to study, schools that provided teachers with structured training for and rewards for involvement in ICs saw higher levels of student participation and improved club effectiveness. Teachers involved in Integrity Club activities running within schools were more invested in the long-term success of such programs than those that integrated it into their professional development programs. This is consistent with past research suggesting that teachers are central to the kind of ethical development that Integrity Club advocates and that teachers should be actively involved in the club's leadership.

Another challenge identified in the study was financial constraints such that most schools could not sustain club activities. Therefore, securing financial support from external sources such as state bodies, NGOs and partners of the private sector may cover the costs associated with the club sustainability. Schools that combined their own internal resources with external stakeholders to obtain funding and mentorship programs also recruited more successful Integrity Club initiates than those that relied solely on internal school resources. Writing that values-based education programs could be effective only if the programs are adequately funded, UNESCO (2021). There was higher student engagement and long-term sustainability of Integrity Club at schools that were sponsored to run club activities like community service projects and leadership workshops.

In addition to having ICs, another important part of sustainability is cultivating student ownership and leadership. In the study, schools that gave students the opportunity to help perform and plan club activities saw higher student engagement and more significant participation in club work. Students also tended to be more committed in their involvement and more likely to encourage involvement by their peers in the leadership roles they held within the Integrity Club. This finding corresponds to what Peck et al. (2016) claimed: the more student led initiatives on values education, the better they would be in maintaining moral development, where ethical learning was more relatable and interactive. Schools who offered leadership and mentorship training in ICs found that there was a lasting effect on student behavior and engagement.

Sustaining ICs also had to do with institutional support and administrative commitment. Workplaces that do not actively support Integrity Club initiatives, have not allocated resources, and or ‘do not provide scheduling flexibility’ were found to be less likely to sustain club activities. However, where administrators in the other schools did not prioritize ICs, the students and teachers were unable to sustain regular engagement. The findings of Isomursu et al. (2011) show how important administrative support is for the continuity of any school-based extracurricular program. Integrity Club activities occurring in the context of schools’ ways of life (policies, annual calendars) were shown to have better continuity and impact.

The analysis also found that school and local community and civic partnerships were important ways of ensuring sustainability. Participation in Integrity Club activities increased for schools that worked with anti-corruption agencies, ethical leadership organizations and local government programs. Exposure to real-world ethical challenges and opportunities to apply learning were found in such partnerships and collaborations. MOE (2022) support this argument that values education is most effective when students see the practical application of integrity beyond the classroom.

ICs can be further extended to make them more effective by integrating club principles in formal academic curricula. Measured by moral awareness and ethical reasoning, Integrity Club discussions in schools, but not in classrooms, bolstered students' performance in these schools. Fiske (2008) found that values-based education should be incorporated into academic and extracurricular learning to provide integrated moral development. Interdisciplinary discussions on ethics happen in schools and students retain and apply integrity principles better.

In addition, enhancing gender balance in Integrity Club participation will likely promote long-term sustainability. The study also showed that male students participated more in club activities than females, necessitating more inclusive student participation strategies. Particularly schools that implemented mentorship programs

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V.CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The aim of this study was to investigate the challenges Integrity Clubs in public secondary schools in Nairobi City County experience. The data confirms that Integrity Clubs are capable of creating honest, responsible, accountable and respectful learners. However, systemic, institutional and socio-cultural challenges limit their effectiveness. Main hurdles are lack of administrative support, lack of teacher help, lack of resources, lack of motivation, peer pressure, and socio-economic pressure. Even with these challenges, the study did find that schools with structured programming, strong leadership involvement, and consistent reinforcement of clubs had higher levels of student participation and better moral outcomes. When fully embedded in school culture, aided by trained patrons, and consistent with students lived realities, Integrity Clubs can be transformational. Thus, the success of the Integrity Clubs depends on deliberate institutional commitment, adequate facilitation, and stakeholder engagement.

5.2 Recommendations

For Integrity Clubs to achieve their intended purpose of nurturing ethical and responsible citizens in Nairobi's public secondary schools, several measures need to be prioritized. First, schools must strengthen institutional support by formally integrating club activities into the school timetable and culture, rather than treating them as peripheral or ceremonial. Active involvement of principals and Boards of Management is essential in ensuring that the clubs are consistently facilitated and monitored. Equally important is the empowerment of teachers and patrons through targeted training on value-based education and mentorship. When teachers are well-prepared and motivated, they can guide students more effectively and sustain their interest in club activities.

Adequate resource allocation is another critical factor. Schools should dedicate funds to support debates, mentorship programs, community service projects, and other value-based initiatives. Partnerships with government agencies, NGOs, and private sponsors can further supplement these resources and expand the scope of club activities. To enhance student engagement, schools should create awareness campaigns that highlight the purpose and benefits of Integrity Clubs, while also encouraging student-led initiatives that foster ownership and motivation. Allowing students greater flexibility in choosing their level of participation can also reduce forced involvement and increase genuine commitment.

In addition, Integrity Club activities should be linked to the academic curriculum, particularly in subjects such as Social Studies, Civic Education, and Religious Studies, to reinforce ethical learning within the formal education framework. Experiential approaches such as debates, role-plays, and peer mentorship should be emphasized to make values education practical and relatable. The clubs should also address contemporary challenges facing students, including digital ethics, cyber bullying, and peer pressure, by organizing workshops and awareness campaigns that equip learners with resilience and critical decision-making skills.

Finally, a robust monitoring and evaluation framework should be established to track participation, activity frequency, and behavioral outcomes. Regular reviews by the Ministry of Education and the Ethics and Anti-Corruption Commission would ensure accountability and provide feedback for continuous improvement. With these measures in place, Integrity Clubs can move beyond symbolic existence to become transformative platforms for character formation, civic responsibility, and ethical leadership among Kenyan youth.

REFERENCES

Caravita, S. C., Sijtsema, J. J., Rambaran, J. A., & Gini, G. (2014). Peer influences on moral disengagement in late childhood and early adolescence. *Journal of Youth and Adolescence, 43*(2), 193–207.

Chang, C. (2010). Internet safety survey: Who will protect the children? *Berkeley Technology Law Journal, 25*, 501.

Çınar, I. (2019). An examination of student club activities from the perspective of school principals and teachers. *World Journal of Education, 9*(4), 123.

Cohen, L., & Manion, L. (2000). *Research methods in education* (5th ed.). RoutledgeFalmer.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage.

Creswell, J. W., & Clark, V. L. P. (2011). *Designing and conducting mixed methods research* (2nd ed.). Sage.

EACC. (2013). *Integrity Clubs manual for secondary schools in Kenya*. Ethics and Anti-Corruption Commission.

EACC. (2018). *Annual report on the status of Integrity Clubs in schools*. Ethics and Anti-Corruption Commission.

Fiske, K. E. (2008). Treatment integrity of school-based behavior analytic interventions: A review of the research. *Behavior Analysis in Practice, 1*(2), 19–25.

Isomursu, M., Ervasti, M., Kinnula, M., & Isomursu, P. (2011). Understanding human values in adopting new technology: A case study and methodological discussion. *International Journal of Human-Computer Studies, 69*(4), 183–200.

Licensed Under Creative Commons Attribution (CC BY-NC)

Ministry of Education. (2022). *Report on student discipline in Nairobi secondary schools (2019–2022)*. Ministry of Education.

Mugambi, M. M. (2022). Inculcating values among learners in schools: An analysis of global practices and approaches. *Journal of Education and Training, 9*(2), 178–188.

Muthuuri, A. K. (2022). Influence of decentralization of Teachers Service Commission functions on service delivery in public secondary schools in Tigania West Sub-county, Kenya (Doctoral dissertation, University of Nairobi).

Nwikina, L., & Nwile, C. B. (2013). Fostering ethical behaviours and culture in Nigeria schools. *International Journal of Learning and Development, 3*(6), 26–36.

Osborne, H. (1931). Definition of value. *Philosophy, 6*(24), 433–445.

Peck, A., Hall, D., Cramp, C., Lawhead, J., Fehring, K., & Simpson, T. (2016). The co-curricular connection: The impact of experiences beyond the classroom on soft skills. *NACE Journal, 76*(3), 30–34.

Skinner, B. F. (1953). *Science and human behavior*. Macmillan.

Teachers Service Commission. (2021). *School discipline audit report for secondary schools in Nairobi County*. Teachers Service Commission.

UNESCO. (2005). *Guidelines for moral and civic education in secondary schools*. UNESCO Publications.

UNESCO. (2021). *Global report on students' moral development and school safety*. UNESCO.

UNICEF. (2013). *Peer mediation and integrity clubs: Lessons from Southern Africa*. UNICEF.

UNICEF. (2022). *Kenya digital safety and youth risk behaviour report*. UNICEF.

Walczak, K., Finelli, C. J., Holsapple, M., Sutkus, J., Harding, T. S., & Carpenter, D. D. (2010). Institutional obstacles to integrating ethics into the curriculum and strategies for overcoming them. In *ASEE Annual Conference and Exposition, Conference Proceedings* (Louisville, Kentucky, 2010).

Zulela, M. S., Neolaka, A., Iasha, V., & Setiawan, B. (2022). How is the education character implemented? The case study in Indonesian elementary school. *Journal of Educational and Social Research, 12*(1), 371.

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Role of kinship social structures in anti-livestock rustling policy implementation in Kuria West sub-county, Kenya

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ABSTRACT

Livestock rustling is a global problem that requires concerted stakeholder interventions. In Kenya, despite dedicated state interventions, including the enactment of anti-livestock rustling policies, the frequency of livestock rustling has not dissipated. This indicates a policy implementation deficiency with regard to stakeholder and agenda inclusivity. This study investigated the influence of kinship social structures on policy implementation against livestock rustling. The study was anchored in the ecological theory of public administration and social control theory. It employed a mixed research design to help collect and analyze data on kinship social networks and their contribution to the implementation of anti-livestock rustling policy and regulations in Kuria West Sub-County. The study was conducted in Kuria West, an arable zone in Kenya, to provide valuable insights on the dynamics of livestock rustling in contrast to its conventional perception as a pastoralist norm characteristic of arid and semi-arid zones. The target population of the study was households and government actors, for instance, deputy county commissioners, chiefs, assistant chiefs, village heads, and the council of elders. The sample size of this study was 496 respondents, consisting of 396 household heads, 47 government actors, and 50 council of elders that were randomly and purposively selected. Methods of data collection included a household questionnaire, interviews with government actors, and focused group discussions with the council of elders. The study adopted Cronbach's metrics of alpha to determine the internal consistency of the instrument. Quantitative data was analyzed using descriptive statistics (frequencies and percentages), while qualitative data was analyzed using content analysis. Collected data was presented in tables. The study findings established that kinship social structures significantly influence anti-livestock rustling policy implementation in Kuria West, Kenya. The study concludes that collaborative governance models that incorporate clan leaders, recognize cultural contexts, and strengthen formal-informal coordination offer the most promising pathway to sustainable, inclusive solutions to livestock rustling.

Keywords: Implementation, Kinship, Policy, Rustling, Social Structures

I. INTRODUCTION

The state's exclusivist policies and the incapacity to accept the distinctive social and cultural contexts of the pastoral communities have made it difficult for public policy interventions to address the practice of livestock rustling on the African continent. Since colonial times, the state has made significant efforts to curb livestock rustling, a backward practice that impedes socioeconomic development in the impacted counties. This contrasts with the developed world, where livestock rustling is illegal and the public policy template is implemented universally (Bunei *et al.*, 2016). From a small-scale, frequently culturally embedded practice, livestock rustling has developed into a highly organized criminal enterprise. Cattle rustling has become entangled with transnational crime networks in places like East Africa, involving armed groups, illegal markets, and sophisticated logistics.

Kinship systems have played a key role overtime in the formation of pastoralist societies especially in the distribution and protection of wealth which comes in the form of livestock. According to Schneider (1979), owning livestock in pastoral societies serves as a way to uphold kinship ties and social hierarchies in addition to being an economic activity. Cattle raiding has historically been viewed as a deeply ingrained cultural practice connected to honor, redistribution, and rites of passage both within and between kin groups. However, the development of livestock rustling into a highly organized, commercialized criminal activity has threatened this traditional system in recent decades.

What started out as a small-scale, symbolic activity has now become intricately linked to networks of cross-border crime, corruption, and arms trafficking, claims Enact (2020). The traditional power of kin-based structures to control or stop livestock rustling has been severely undermined by this change. As a result, a lot of international policy responses now support technology-driven interventions like livestock identification and tracking systems, regional

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coordination, and improved law enforcement mechanisms rather than merely depending on traditional community structures (Enact, 2020).

In Kenya, kinship continues to play a critical, albeit evolving, role in shaping the social structures of pastoralist communities. Among ethnic groups such as the Kalenjin, Pokot, and Turkana, kinship networks particularly clans (oret) and age-sets (ipinda) have historically provided the organizational basis for both economic life and security (Onditi, 2022). Elders traditionally mediated conflicts and determined when, how, or if cattle raids occurred. These mechanisms were effective when social cohesion within kinship lines was strong and when rustling was perceived more as a cultural practice than a criminal act.

However, several studies show that modernization, poverty, and the influence of external political and economic forces have weakened these traditional structures. In Kilgoris (Narok County), for instance, low levels of formal education, strict adherence to traditional customs such as bride price, and weak community leadership have fostered conditions where livestock rustling is normalized and sometimes encouraged by kinship obligations (Kanda, 2016). Similarly, in Baringo County, while indigenous conflict resolution methods are still practiced among the Tugen, Ilchamus, and Pokot, their effectiveness is limited in dealing with modern, militarized rustling (Kamais & Mosol, 2022).

1.1 Statement of the Problem

Livestock rustling in Kuria West, similarly in other pastoralist societies in the arid and semi-arid zones in Kenya, has transformed from an endemic cultural practice into a violent undertaking driven by commercial intent that has attracted diverse stakeholders. The state has, since colonial times, attempted to contain and eradicate it through legislative and administrative acts to no avail.

Several studies have attempted to link kinship social structures in anti-livestock rustling policy implementation (Marigat, 2023; Sani Ibrahim et al, 2021). However, these studies were carried out in different geographical contexts as they did not explore how kinship social structures influence anti-livestock rustling policy implementation. The lack of engagement of traditional kinship networks and the attendant social capital has exacerbated the gap between policy implementation and community wellbeing and sustained the vicious cycle of poverty in Kuria West. In specific terms, the reliance on coercive law enforcement and technological interventions is a symptom of the deliberate avoidance of incorporating the intrinsic capacity of existing kinship social networks and customary institutions that paradoxically act as gatekeepers of the culture of livestock rustling. In the real sense, however, kinship social structures in pastoralist societies have historically served as vital frameworks for maintaining order, regulating wealth distribution, and resolving conflicts within pastoralist communities (Schneider, 1979).

1.2 Research Objective

To examine the role of kinship social structures on anti-livestock rustling policy implementation in Kuria West

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Ecological Theory of Public Administration

The Ecological theory of public administration founded by (Riggs, 1961) states that public administration works not in isolation but in its ecological environment. This environment is largely characterized by structures, culture and socio-economic factors. Riggs (1961) further postulates that formal state interventions such as administrative structures and state policies (anti-livestock rustling policies) ought to conform to the environment in which they operate and should leverage existing social structures e.g. kinship social networks to ensure state interventions for instance anti-livestock rustling policies are effective and efficient. The theory further demands that effective public administration ought to take into account the interplay between state interventions and the traditional informal governance systems in which they operate.

2.1.2 Social Control Theory

According to Travis Hirsch's 1969 social control theory, people form bonds that, in turn, control their behavior when prompted to commit criminal acts or do good for the community. Based on four pillars, namely, attachment, commitment, involvement, and belief. Together, these four social bonds offer a multidimensional framework for strengthening the implementation of anti-livestock rustling policies. While belief guarantees long-term value alignment, involvement lowers idleness and deviance, commitment secures investment in legal livelihoods, and attachment cultivates trust in institutions. Policymakers can guarantee that anti-rustling measures are not only implemented but also accepted as culturally acceptable and long-lasting by utilizing these ties (Hirschi & Stark, 1969).

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2.2 Empirical Review

Burke et.al., (2023) explored the state of kinship care in British Columbia (BC), Canada 10 years after the implementation of major policy reform designed by the provincial government to improve services to kinship caregivers. It arises from a community-based research project that included Parent Support Services (PSS), a charitable nonprofit organization that supports kinship caregivers in BC, and the University of Northern British Columbia (UNBC). Two hundred participants were involved, including kinship caregivers and key informants. Data collection used surveys, focus groups, and interviews. The key recommendation from this article is that there should be ongoing evaluation of the experiences of kinship caregivers, particularly after policy changes, to ensure that kinship care programs meet the needs of those for whom they were created. Based on what was shared by the caregivers, secondary recommendations around the provision of supports and services are also provided.

Public policy implementation against livestock rustling in the Sahel region of Africa is generally challenged by the dynamic nature of the practice as a result of the vibrant trade in illicit small weapons. Ojewale (2024) examined the internationalization of cattle rustling as a form of banditry in the border regions of southwest Niger and northwest Nigeria, identifying it as a critical security threat with severe humanitarian implications. From 2019 to 2022, incidents of livestock rustling in northwest Nigeria and southwest Niger increased by 1028.57% and 957.14%, respectively, highlighting the alarming scale of the crisis. The study attributed this rise to multiple conflicts, perceived injustices, governance failures in addressing endemic poverty, and escalating competition over natural resources. These factors have created a volatile environment, exacerbated tensions and fuelled cycles of violence that significantly disrupt rural livelihoods in these areas.

Defere et.al. (2022) examined how the international boundary along the Ethiopia–Kenya border affects pastoralists' access to cross-border environmental resources. Historically, ethnic groups in this region shared ecosystems, migratory patterns, and trade networks, but the colonial boundary disrupted these traditional practices by restricting mobility and dividing communities. Using qualitative methods, including key informant interviews, in-depth interviews, and focus group discussions, the study found that the boundary limits pastoral mobility, impedes access to shared resources, and disrupts livelihoods. Despite these challenges, ethnic kinship ties and indigenous institutions have enabled the Moyale pastoralists to maintain some level of mobility and resource access. These mechanisms have also supported conflict management and helped sustain pastoral livelihoods in the face of restrictive border policies, (Onditi, 2022).

III. METHODOLOGY

3.1 Research Design

This study adopted a qualitative research design using mixed research methods. It enabled the combination of quantitative and qualitative research techniques to provide a comprehensive understanding of the complex phenomenon of anti-livestock rustling policy implementation This approach is appropriate when the entire scope of the research problem cannot be sufficiently captured by either quantitative or qualitative methods alone (Creswell & Clark, 2018). Similar studies have used the same research design with respondents of similar characteristics. In their study on community-based interventions to prevent livestock theft in northern Kenya, Lekimain (2020) used a mixed methods design. They demonstrated how clan elders and family loyalty influence how the community reacts to rustling through key informant interviews and household surveys.

3.2 Target Population

As presented in Table 1 below, the study focused on households from seven different locations in Kuria West, as well as opinion leaders, village elders, chiefs, assistant chiefs, deputy county commissioners, anti-stock corporals/inspectors, the county chief officer in charge of agriculture and livestock, and the county executive committee member in charge of agriculture, livestock, and fisheries blue economy.

Table 1

Target Population

Actors	**Target Population**
County commissioner	1
Deputy county commissioner	1
Chief	7
Assistant chief	12
Village elders	240
Council of elders	50
Sub total	**311**
Household Heads	39723
Total	**40,034**

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3.3 Sampling Design and Sample Size

Sampling is the statistical process of selecting a subset of a population of interest for purposes of making observations and statistical inferences about that population (Bhattacherjee, 2012). Sampling process encompasses determining the population, sampling frame, sampling method, and sample size.

3.4 Sampling Procedure

The study used a multi-stage sampling procedure tailored to the characteristics and roles of the three distinct population groups: household heads, government officials, and the council of elders. Each category employed a sampling strategy that matched the size and makeup of the group as well as the data collection method.

3.4.1 Sample Size

The sample size was determined using Yamane's formula (1967)**:**

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n: Infinite sample population

N: The total population (number of referral hospital employees from management department)

e: error term indicating the level of accuracy which is $\pm$ 5%.

$$n = \frac{39723}{1 + 39723(0.05)^2} = 396$$

Sample Size = 396 household heads

The government officials targeted in this study comprise a relatively small, structured, and purposively selected group, totaling 265 individuals. These officials were segmented into six subgroups based on their administrative roles, namely: one county commissioner, one deputy county commissioner, four assistant county commissioners, seven chiefs, twelve assistant chiefs, and 240 village elders.

A census approach was chosen for this subgroup due to its strategic significance and small number of senior officials. This implies that the sample was automatically composed of all high-ranking officials, such as chiefs, assistant county commissioners, deputy county commissioners, and county commissioners. Because of their roles, they have important knowledge about how anti-livestock rustling laws are implemented and how formal governance structures and customary kinship systems interact. For the assistant chiefs and village elders, a purposive sampling technique was employed to ensure balanced representation across different administrative regions. Selection was based on criteria such as regional diversity, experience in handling livestock rustling cases, and active involvement in community leadership. In particular, approximately 10% to 20% of the village elders (i.e., 24 to 48 individuals) were selected to participate in structured interviews. This approach ensured that a wide array of perspectives was captured while maintaining the study's manageability and depth of inquiry.

The 50 traditional leaders who make up the Council of Elders, known locally as Abhaghaka Bhi Inchama, are crucial to the community's cultural governance. Four FGDs with ten to twelve elders each were conducted, for a total sample size of forty to forty-eight people. This format guarantees that conversations stay controlled and interactive, giving every elder a fair chance to participate.

Table 2

Sample Size

Group	Sample Size
Household Heads	396
Government Officials	47
Council of Elders	48

3.5 Data Collection Methods

To gather information from a variety of sources, including households, village elders, local administrators, the Kuria council of elders, and reformed rustlers, this study combined questionnaire surveys, interviews, and focused group discussions. The respondents shared their perspectives on how kinship social structures affect the Kuria West sub-county's implementation of the livestock rustling policy.

3.6 Data Analysis

The study used a wide range of data analysis techniques to ensure that both quantitative and qualitative data were properly collected, examined, and interpreted. A mixed method approach is used to comprehend the connection between livestock rustling policy implementation and kinship social networks.

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Collected data was tabulated and presented using descriptive approach for qualitative data while quantitative data would be analyzed using descriptive statistics methods such as percentages and frequencies.

IV. FINDINGS & DISCUSSION

4.1 Kinship Social Structures and Public Policy Implementation

The study sought to explore the influence of kinship social structures on Public Policy Implementation. The findings are generated as shown in table 3.

Table 3

Kinship Social Structures

Item	Response Type	Response / Summary	Frequency / Breakdown	Percentage (%)
Who is the household head?	Closed	Father / Mother	Father: 177, Mother: 36	Father: 83%, Mother: 17%
Does your clan have a leadership that governs the entire clan?	Yes/No	Yes	Yes: 180, No: 33	Yes: 84.5%, No: 15.5%
What is the role of the clan leadership?	Descriptive	Unity, Conflict Resolution, Minor Dispute Handling	- Unity: 41, Conflict Resolution: 39, Disputes: 33	Unity: 39%, Conflict Resolution: 37%, Disputes: 24%
Is the clan the best platform to address current societal issues?	Yes/No	Yes	Yes: 158, No: 55	Yes: 74%, No: 26%
Are there clan taboos or traditions that bind members?	Yes/No	Yes	Yes: 169, No: 44	Yes: 79.3%, No: 20.7%
What is the role of women, youth, and girls in your clan?	Descriptive	Support heads, Care for property, Fetch water/firewood	Support roles: 136, Property & chores: 77	Support: 64%, Chores: 36%
My clan promotes livestock rustling as belonging symbol	Yes/No	No	Yes: 96, No: 117	Yes: 45.1%, No: 54.9%
'Ukunibha' from non-Kuria clans is accepted	Yes/No	No	Yes: 88, No: 125	Yes: 41.3%, No: 58.7%
Clan protects members from rustling punishment	Yes/No	Yes	Yes: 125, No: 88	Yes: 58.7%, No: 41.3%
Hybrid approach (clan + state) is best	Yes/No	Yes	Yes: 189, No: 24	Yes: 88.7%, No: 11.3%
Mechanisms that promote/prohibit livestock rustling	Yes/No	Yes	Yes: 179, No: 34	Yes: 84%, No: 16%
How do elders address livestock rustling?	Descriptive	Public barazas, Local discipline	Public barazas: 128, Local discipline: 85	Barazas: 60%, Discipline: 40%
Challenges clans face in addressing rustling	Descriptive	Brutality, Lack of honesty, Poor coordination, No government support	Multiple mentions	—
Role of intra/inter-communal relations in resolving rustling conflicts	Descriptive	Unity of purpose, Intelligence sharing, Joint barazas	Multiple mentions	—
Does your clan/family have livestock rituals?	Descriptive	Yes	Response given in open-ended format	—
Effects of livestock rituals on rustling	Descriptive	Conflict, Loss of life and property	Major theme reported	—
Unique livestock branding symbols used by clan	Yes/No	No	Yes: 70, No: 143	Yes: 33%, No: 67%

As indicated in table 3, 84.5% of respondents agreed on the existence and authority of clan leadership structures, with roles in unity, conflict resolution, and dispute handling. This aligns with findings in Rajasthan, India**.** Joint family and clan-based systems in rural Rajasthan operate as parallel governance structures**,** providing livestock security and arbitration services that often bypass formal legal frameworks (Akall, 2021). In the same breath Lekimain, (2020) opine that these kinship institutions emphasize social harmony over punitive justice, reinforcing what the Kuria case illustrates where elders play central roles in settling disputes, and local barazas (identified by 60% of Kuria respondents) serve as effective governance platforms. The results further indicate that 58.7% of respondents believe clans shield

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rustlers from punishment**,** and 41.3% consider stealing from non-Kuria clans acceptable a sentiment echoed in Mensah (2024), assertion that kin-based protectionism in Rajasthan often undermines policy enforcement by prioritizing loyalty over legality. These cultural justifications, while rooted in traditional values, challenge the legitimacy and reach of state law, especially when offenders are protected based on clan identity, as one village head in Kuria admitted: *"It's hard to report a rustler when he's your nephew."*

According to Ojewale (2024), there are notable parallels between Kuria West and the internationalization and militarization of livestock rustling in Nigeria and Niger. The study participants' accounts of rustler brutality, a lack of government support, and poor coordination highlight the growing security threat posed by organized rustling, despite the fact that armed banditry is less common in Kuria. The Kuria findings suggest that socioeconomic marginalization and low institutional credibility cause communities to rely more on clan structures than on state actors, similar to Ojewale's discovery that endemic poverty and poor governance in West Africa spur cattle rustling.

The trust deficits in government systems are evident in sentiments such as "*The chief says one thing, the police say another. People prefer to follow elders*." This is consistent with a larger pattern seen in conflict-prone areas, where informal justice systems are frequently seen as more adaptable and culturally acceptable than formal ones. Cattle rustling is both a symptom and a cause of governance breakdowns because, as Ojewale's study shows, this disconnects fuel cycles of violence and resistance to enforcement.

The study findings also indicated that 83% of households are headed by men and women play limited roles in peace building (64% being relegated to domestic support), mirrors gendered divisions of labor in other kinship-governed societies. While this dynamic is less directly addressed in the referenced empirical literature, it aligns with broader anthropological observations that male dominance in pastoralist communities reinforces control over livestock and conflict decisions**,** as livestock are deeply tied to status, initiation, and marriage rites. One village head's statement *"A cow is not just an animal here. It is used for marriage, initiation, and even appeasing ancestors"* further illustrates how cultural symbolism amplifies male authority in livestock-related matters.

This situation echoes Singh et al. (2020) caution that cultural traditions, while maintaining cohesion, can obstruct reform**,** particularly when they entrench exclusionary norms or justify harmful practices like rustling. The limited participation of women and youth also points to missed opportunities for inclusive conflict resolution, something noted by FGD participants who advocated for their inclusion in a hybrid policing model**.**

While the Kuria study did not directly examine cross-border dynamics, the recognition of clan-based traditions and taboos by 79.3% of respondents**,** as well as the inter-clan justifications for rustling, resonate with findings by Defere et al. (2022) along the Ethiopia–Kenya border. Their study highlights how colonial boundaries disrupted indigenous networks**,** yet kinship ties continue to facilitate mobility and conflict management. Similarly, in Kuria West, despite national laws, clan affiliations still shape behavior and mediate conflict**,** often independently of state authority. This affirms the enduring relevance of indigenous institutions in pastoral areas and reinforces the need to recognize them as partners in peacebuilding

Table 4

Public Policy Implementation

Item	Response Type	Response / Summary	Frequency / Breakdown	Percentage (%)
Kinship structures influence anti-livestock rustling policies	Yes/No	Yes	Yes: 132, No: 81	Yes: 62%, No: 38%
Clan protects members from rustling punishment	Yes/No	Yes	Yes: 125, No: 88	Yes: 58.7%, No: 41.3%
Elders mediate livestock rustling policies	Yes/No	Yes	Yes: 136, No: 77	Yes: 63.8%, No: 36.2%
Hybrid approach (clan + state) is best	Yes/No	Yes	Yes: 189, No: 24	Yes: 88.7%, No: 11.3%
Elders mediate livestock rustling policies	Yes/No	Yes	Yes: 136, No: 77	Yes: 63.8%, No: 36.2%
Mechanisms that promote/prohibit livestock rustling	Yes/No	Yes	Yes: 179, No: 34	Yes: 84%, No: 16%
Factors hindering clan-government collaboration	Descriptive	Slow action from government	Frequent theme	—

The findings in Table 4 indicates that a majority of respondents (88.7%) agreed that they support a hybrid governance model, combining clan-based leadership with formal state enforcement, a view echoed across interviews and FGDs. This is consistent with policy recommendations from the Ethiopia-Kenya border (Defere et al., 2022) and Ostermann-Miyashita et al., 2025) where advocacy for cooperative, participatory frameworks that uphold legal compliance while acknowledging the legitimacy of traditional actors. As one elder stated: *"If our decisions are given legal backing, the community will respect them more than court rulings."* This statement encapsulates a central theme in the literature: legitimacy matters, and legitimacy often lies with the elders, not the courts. A significant majority of

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respondents (62%) recognize the influence of kinship structures on policy outcomes related to rustling. This implies that public policy cannot be effectively designed or implemented in isolation from these traditional systems. This finding was echoed by an elder, "When policies come from the government, people listen. But when the clan elders speak, people obey." The findings further reveals that a significant majority of respondents (62%) recognize the influence of kinship structures on policy outcomes related to rustling. This suggests that public policy cannot be effectively designed or implemented in isolation from these traditional systems. The study also revealed that Clan protects members from rustling punishment (58%). The study further indicated that Elders mediate livestock rustling policies (63.8%). majority of respondents (84 %) are aware of local mechanisms (norms, taboos, or sanctions) that either encourage or discourage rustling. This indicates that behavior is governed more by social norms than formal laws.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study emphasizes how patriarchal clan structures predominate in Kuria West, Kenya, where men lead 83% of households and hold the majority of leadership positions. Clan systems are firmly established as grassroots governance structures; according to 84.5% of respondents, they play a part in resolving disputes, preserving peace, and tackling social issues. However, because these structures are solely driven by men, they exclude women and young people from leadership and peacebuilding roles, which makes it more difficult to make inclusive decisions.

Kinship relationships have a big impact on how anti-livestock rustling policies are implemented; almost half of the respondent's justified theft from non-Kuria clans by connecting rustling to clan identity. This shows the clan's preference for loyalty over legality, normalizes livestock theft, and undercuts formal legal systems. In rural justice and livestock dispute resolution, traditional venues such as elder mediations (63.8%) and public barazas (recognized by 60%) continue to be crucial.

According to qualitative data, livestock have deep cultural symbolism and are connected to ancestral customs and rites of passage. This reinforces male dominance and provides justification for behaviors that conflate tradition and criminality. Elders demanded legal recognition of clan forums, integration into state policing, and hybrid governance models, criticizing the state's formal justice system for being slow and contemptuous of their opinions.

Clan leadership improves local governance and cultural cohesion, but it also makes state-led anti-rustling initiatives more difficult. The results back up the demand for hybrid, inclusive enforcement frameworks that formally include clan institutions without sacrificing the integrity of the legal system.

5.2 Recommendation

Clan elders, chiefs, and village leaders should be formally acknowledged by policymakers and involved in anti-rustling efforts. These traditional leaders can serve as a link between communities and state institutions and have social legitimacy. Information flow, trust, and local enforcement can all be enhanced by forming organized collaborations like community policing units, which are jointly run by security guards and elders.

Programs for community education should be started by governmental and non-governmental organizations to increase knowledge of the legal ramifications of livestock rustling. Along with honouring and maintaining good customs, these programs must also combat damaging cultural narratives like songs and rituals that exalt raiding. Without alienating the community, customized sensitization campaigns can encourage behavioural change.

REFERENCES

Akall, G. (2021). Effects of development interventions on pastoral livelihoods in Turkana County, Kenya. *Pastoralism, 11*(1), 23.

Bhattacherjee, A. (2012). *Social science research: Principles, methods, and practices.* University of Florida.

Bunei, E. K., McElwee, G., & Smith, R. (2016). From bush to butchery: Cattle rustling as an entrepreneurial process in Kenya. *Society and Business Review, 11*(1), 46–61.

Burke, S., Bouey, J., Madsen, C., Costello, L., Schmidt, G., Barkaskas, P., ... & Murium, R. (2023). Kinship care: Evaluating policy and practice. *Journal of Public Child Welfare, 17*(3), 647–668.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Defere, G., Mulugeta, M., & Tolera, T. (2022). Effects of international boundary making on pastoralists' transboundary environmental resource use in the Ethiopia–Kenya borderland. *The Rangeland Journal, 44*(4), 203–212. https://doi.org/10.1071/RJ22051

ENACT. (2020). Cattle rustling: From cultural practice to deadly organised crime. *ENACT Observer.*

Hirschi, T., & Stark, R. (1969). Hellfire and delinquency. *Social Problems, 17*(2), 202–213.

Licensed Under Creative Commons Attribution (CC BY-NC)

Kamais, C. E., & Mosol, G. P. (2022). Recasting low intensity conflicts in Laikipia County, Kenya, through protracted social conflicts paradigm: Causes, socioeconomic, political and security implications. *Open Access Library Journal*, *9*(7), 1–24.

Kanda, R. K. (2016). Effect of pesticides use on honeybee (Apis mellifera L.) mortality and honey production in Transmara West sub-county, Narok County, Kenya (Doctoral dissertation, Maseno University).

Lekimain, M. J. (2020). Effects of cattle rustling on community livelihood in Baragoi Sub-County, Samburu County, Kenya (Doctoral dissertation, St. Paul's University).

Marigat, S. K. (2023). Managing cattle rustling by enhancing police–community cooperation in the Karamoja Cluster: Lessons from Baringo, Kenya. *African Security Review*, *32*(1), 81–98.

Mensah, R. O. (2024). Reviewing the theoretical and conceptual frameworks in criminology research: A positivity & normativity perspective from an African researcher. *Mediterranean Journal of Social Sciences, 15*(4), 85–97. https://doi.org/10.36941/mjss-2024-0032

Ojewale, O. (2024). Perils of proximity: Banditry and the geography of cattle rustling in border regions of southwest Niger and northwest Nigeria. *South African Journal of International Affairs, 31*(3), 315–335.

Onditi, F. (2022). Preventing atrocities among pastoral communities through disarmament: A study of the Karamoja Cluster in the Horn of Africa. *Human Rights and Governance: Human Rights & IHL*.

Ostermann-Miyashita, E. F., Kirkland, H., Eklund, A., Hare, D., Jansman, H. A., Kiffner, C., ... & König, H. J. (2025). Bridging the gap between science, policy and stakeholders: Towards sustainable wolf–livestock coexistence in human-dominated landscapes. *People and Nature*. https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/pan3.10786

Riggs, F. W. (1961). *The ecology of public administration.* Asia Publishing House.

Sani Ibrahim, S., Ozdeser, H., Cavusoglu, B., & Abdullahi Shagali, A. (2021). Rural migration and relative deprivation in agro-pastoral communities under the threat of cattle rustling in Nigeria. *Sage Open, 11*(1), 2158244020988856.

Schneider, H. K. (1979). *Livestock and equality in East Africa: The economic basis for social structure*. https://www.cabidigitallibrary.org/doi/full/10.5555/19812609087

Singh, R., Sharma, R. K., Babu, S., & Bhatnagar, Y. V. (2020). Traditional ecological knowledge and contemporary changes in the agro-pastoral system of upper Spiti landscape, Indian trans-Himalayas. *Pastoralism, 10*(1), 15.

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

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Evolving students' learning habits from books to robotics: A case of college of business education, Dar es Salaam Campus, Tanzania

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ABSTRACT

The use of robotics and Artificial Intelligence (AI)-powered conversational tools is quickly transforming the way education operates, especially at the higher learning level. This research examined how these innovations are being adopted at the College of Business Education (CBE) in Dar es Salaam and investigated their influence on students' academic outcomes and learning patterns. The study was guided by the Technology Acceptance Model (TAM), which explains how perceptions of ease of use and usefulness affect the adoption of technology, and by Cognitive Load Theory (CLT), which highlights the importance of controlling mental effort in the learning process. A mixed methods approach was applied, bringing together survey data from 389 respondents chosen through stratified and simple random sampling along with qualitative insights collected from interviews. The study gathered information through structured questionnaires and detailed interviews. Quantitative data were analyzed using SPSS, while qualitative responses were examined through thematic analysis. Findings showed that students who had access to robotics tools demonstrated higher levels of engagement, stronger motivation, and better academic performance. The main factors that encouraged adoption included ease of use, the ability to adapt to individual learning styles, and the support provided by the instructors. Students especially appreciated the interactive and personalized learning environments made possible through robotics, as these enhanced their overall learning experience. However, the study also pointed out important challenges. Serious concerns remain regarding limited access, especially for students from less privileged backgrounds, and the possibility of becoming overly dependent on technology. These challenges bring up questions about digital equity and the potential decline of independent learning abilities. The study suggests that access to robotics technologies should broaden, provide focused training for both students and instructors, and officially weave robotics into the curriculum. It is essential to adopt a steady approach that takes advantage of robotics while still honoring traditional teaching methods. Striking this balance is key to helping students grow into independent, critical thinkers. The study provides important insights for using robotics effectively and fairly in higher education, especially in developing countries.

Keywords: AI-powered Tools, Learning Habits, Robotics, Robotic Tools, Technology Adoption

I. INTRODUCTION

The use of robotics and Artificial intelligence (AI) driven technologies is reshaping how education is delivered around the world. Once primarily used in factories and industrial settings, robotics has now expanded into fields like healthcare, social services and especially education (Arocena et al., 2022). In education, robotics sits at the crossroads of mechanical engineering, computer science and artificial intelligence, focusing on creating machines capable of performing tasks with little human input (Uslu et al., 2023). Robots and Artificial intelligence tools such as virtual tutors and chatbots are becoming common in classrooms. They are not only taking over repetitive or detail oriented tasks but also supporting more engaging ways of learning. This development is helping to increase student participation and in many cases improve academic performance. The use of these technologies is reshaping traditional teaching methods and creating opportunities for more personalized and dynamic learning experiences (Soori et al., 2024).

Robotic technologies are now firmly embedded in education, providing interactive platforms that deliver lessons, give instant feedback, and adapt to unique needs of each student. AI powered tools such as chatbots that act like human tutors are able to tailor instruction, respond to student questions at any time, and guide learners throughout their studies. Making the learning process more personalized, these systems encourage stronger engagement and motivation while also helping students to achieve better understanding (Casheekar et al., 2024).

Robotics is playing an important role in promoting socio-economic development and connects closely with global initiatives such as the United Nations Sustainable Development Goals. Its influence is particularly evident in SDG 4, which aims to improve education, and SDG 9, which highlights the value of industry and innovation. Beyond their technical capabilities, robotics technologies are actively driving progress in these key areas (Mai et al., 2022). Robotics is transforming industries including healthcare, agriculture, logistics and education. These technologies help

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make operations more efficient, reduce costs, and increase productivity. Since there are ongoing concerns about job displacement, it is also evident that robotics creates new roles and opportunities that were not available before. Overall, the use of robotics promotes greater efficiency and adaptability in these essential sectors (Licardo et al., 2024).

In today's educational settings, the use of robotic systems helps create a more inclusive and high quality learning experience. These technologies assist students in developing critical thinking and problem solving skills, which are becoming increasingly important in a technology driven workforce. Instead benefiting only advance learners, these systems give all students the chance to engage deeply with challenging concepts, preparing them for the changing demands of the modern workplace (Rane et al., 2024).

Countries such as the United States, Japan, and Germany are leading the way in adapting robotics, largely due to significant investments and well developed infrastructures (Rakhmanina et al., 2022). In these nations, robotics education often starts early, helping students build strong foundation in Science Technology Engineering and Mathematics (STEM) subjects (Uslu et al., 2023). Developing countries, on the other hand, face challenges like high costs and limited expertise. Despite these obstacles, progress is being made with support from non-governmental organizations and international partnerships (Aderibigbe et al., 2023).

Policy frameworks such as European Union's Digital Education Action Plan and Tanzania's National ICT Policy strongly support the use of robotics to improves educational outcomes and reduce disparities (Bowman, 2023). Robotics technologies not only strengthen digital literacy but also promote active and hands-on learning, helping students connect theory with practical skills and better preparing them to participate in digital economies (Bhatia et al., 2024).

1.1 Statement of the Problem

The use of robotics in educational settings has shown positive results around the world, especially in increasing student engagement , encouraging critical thinking, and enhancing academic performance (Ghofur, 2025). Many studies highlight the important role robotics plays in STEM education, particularly in developing students' technical and cognitive skills (Casheekar et al., 2024). However, most of these research come from developed countries with strong technical infrastructure. There is still a significant gap in understanding how robotics works in less resourced environments, such as Tanzania, where access to technology is much more limited (Safonov et al., 2022).

In Tanzania, and specifically at institutions like the College of Business Education (CBE), the use of robotics remains relatively unexplored. Although technology integration in academic settings has been gradually increasing, there is limited data on how robotics actually affects student learning habits and academic performance. Ongoing challenges include restricted access to robotic equipment, insufficient institutional readiness, and difficulties with how user friendly these technologies are. This study aims to fill these gaps by examining how robotics is currently being used at CBE, evaluating its impact on students' learning approaches and academic outcomes, and identifying the obstacles that prevent more effective implementation.

1.2 Research Objectives

This paper aims to examine the factors influencing students' shift from traditional methods to robotic-assistive approaches at College of Business Education, Dar es Salaam Campus.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), introduced by Davis in 1989, offers a foundational way to understand how people engage with and adopt new technologies. The model focuses on two main factors: perceived usefulness and perceived ease of use, both of which strongly influence users' attitudes toward adopting technological innovations (Liesa-Orús et al., 2023). Perceived usefulness refers to the degree to which a person believes that using a specific technology will improve their performance or outcomes (Ratnawati & Darmanto, 2023). In education, students' views on robotic tools, especially regarding how these tools enhance understanding, engagement, and overall learning outcomes, can greatly affect how well such technologies are accepted and used.

Perceived ease of use relates to how simple and intuitive a technology feels to users (Liesa-Orús et al., 2023). The moment students interact with robotic tools that are easy to operate, they are more likely to use them. Technologies that are difficult to understand or navigate can discourage learners, intuitive and user-friendly design make a real difference. Students' willingness to adopt robotics in learning environments often depends on their confidence that the tools are manageable. Peer opinions and general attitudes toward new technology also play a role; the simplicity of the interface remains a key factor. TAM provides a helpful framework for understanding what drives the use of robotics in

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education. It emphasizes the importance for educators and developers to focus on accessibility and efficiency, ensuring that robotics is both approachable and effective, which in turn encourages wider adoption in learning settings.

2.1.2 Cognitive Load Theory (CLT)

Sweller's Cognitive Load Theory explains that people have limited mental capacity, so it is important not to overwhelm learners with too much information at once. When learning materials are overly complex or disorganized, they can hinder understanding and memory (Sweller, 2023). Robotics technology helps address this challenge by breaking down complicated concepts into more manageable pieces, making them easier for learner to grasp. Students can focus on what really matters without feeling lost in unnecessary details.

Robotic tools, including virtual tutors, enhance learning by dividing complex material into simpler components and adjusting instruction to match each learner's progress and understanding (Nie et al., 2024). These technologies provide personalized learning pathways, creating a structured yet flexible environment that supports cognitive efficiency. Through presenting content in an organized and interactive way, robotic tools not only improve comprehension but also encourage greater engagement and better long term retention. As a result, even the most difficult topics become more approachable and sustainable for learners.

2.2 Empirical Review

2.2.1 Students' shift from traditional methods to robot-assistive approaches

Higher education has undergone a remarkable transformation, moving away from the traditional lecture style that kept students in a passive role for many years (Lai, 2021). With the growth of technology, and robotics in particular, classrooms are becoming more dynamic and interactive. Students are no longer limited to listening and taking notes; they now have the opportunity to engage directly, experiment with ideas, and take part in shaping their own learning. This change is not just cosmetic, it reflects a strong need for education to be practical, flexible, and aligned with the rapid pace of the modern world. Robotics brings abstract theories to life, turning them into tools that students can apply in real situations. The shift makes difficult concepts more concrete and understandable, and it represents an important move toward education that is both meaningful and relevant to the demands of contemporary society (Soori et al., 2024).

A major advantage of robotics is its ability to personalize the learning process. These systems respond to individual needs by offering immediate feedback and guidance (Zhang & Zhu, 2024). Despite allowing students to learn at their own pace, robotics reduces stress and encourages deeper understanding. Research has also shown that personalized learning improves both performance and motivation (Bhatia et al., 2024). Robotics also equips students with critical and analytical skills that are in high demand in the job market. Skills in coding, automation, and artificial intelligence are developed through hands-on use of robotics (Licardo et al., 2024). Through integrating robotics into their curricula, institutions prepare graduates to succeed in industries undergoing rapid digital transformation (Bhatia et al., 2024).

Despite these benefits, challenges remain. Some institutions lack the infrastructure needed to fully implement robotics, while others fear losing the human interaction that is central to teaching and learning (Zhang et al., 2024). The challenge, therefore, is to balance robotics with traditional methods so that technology enhances learning without replacing the essential human connection (Soori et al., 2024).

III. METHODOLOGY

3.1 Research Design

The study was conducted to explore how students engage with robotics in their learning journey. Rather than depending on a single approach, the researchers adopted both qualitative and quantitative methods, which offered a broader and more advanced perspective (Adeoye, 2024). This mixed-methods design not only captured measurable outcomes but also highlighted the personal experiences and viewpoints of the students involved. It provided a richer understanding of how learners perceive robotics and the reason for their shift.

3.2 Population of the Study

The research focused on the Dar es Salaam campus of the College of Business Education (CBE), which has a student population of about 14,219 across different academic levels. From this large population, a carefully chosen sample of 389 students was drawn using a combination of stratified and simple random sampling. This ensured that different groups within the student body were fairly represented.

3.3 Sampling Strategies

In this study, students were first grouped according to their level of study, which included Certificate, Diploma, Bachelor's, Postgraduate diploma, and Master's programs. They were also categorized according to their prior exposure

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to robotics tools. From within each group, a simple random selection was used, giving every student an equal opportunity to take part in the research (Rahman, 2023). This sampling approach helped to minimize selection bias and added strength to the findings by ensuring that a wide range of perspectives and experiences with educational robotics were represented (Reddy & Khan, 2023). As a result, the study achieved greater reliability and validity in its conclusions.

3.4 Sample Size

A total of 389 students were chosen for study using Slovin's formula, a method frequently used to determine sample sizes for large populations when the level of variation is unknown (Anggraini et al., 2025). The total population at the campus was 14,219, and a margin error of 0.05 was applied to ensure the sample accurately represented the larger group.

$$n = \frac{N}{1 + N.(e^2)}$$

Where: n – is number of sample (required)

N – Total population (14219) and

e – Error tolerance (level) or margin of error (0.05)

Using the formula, sample size was calculated as follows;

$$n = \frac{14219}{1 + 14219(0.05)^2}$$

Therefore:

$$n = 389$$

3.5 Data and Data Collection Methods

The researchers used a combination of methods, relying on structured questionnaires as well as in-depth interviews to study how robotics is being integrated into education. The questionnaire offered measurable insights into the extent of robotics use and its influence on students' academic performance. At the same time, interviews provided a closer look at students' real experiences, bringing out both the benefits and the challenges they faced. This combination of approaches made it possible to capture not only the statistical patterns but also a deeper and more detailed picture of how robotics is reshaping the learning environment at the College of Business Education (CBE).

3.6 Validity and Reliability of Data

The researchers first piloted the questionnaire with 10 students who were not included in the main sample. This step helped to confirm that the questions were clear and interpreted in the same way by participants. Cronbach's alpha was calculated and scored above 0.70, which indicated reliable results (Izah et al., 2023). For qualitative side, respondent validation was used, allowing interviewees to review their transcripts and confirm that everything was accurate (Kennedy, 2022). The instruments were reviewed by experts to ensure the content aligned with the study's objectives. Construct validity was further checked through factor analysis for thoroughness (Lambert & Newman, 2023). Finally, triangulation was applied by combining data from questionnaires, interviews, and existing literature. This blended approach enhanced both the credibility and the overall rigor of the study.

3.7 Data Analysis

The study used a mixed method design that brought together both quantitative and qualitative approaches to better address the research goal. On the quantitative part, Statistical Package for the Social Sciences (SPSS) was used to meticulously clean, code, and analyze data from structured questionnaires using descriptive statistics, such as means and frequencies. Researchers used thematic analysis to sort through interview transcripts for the qualitative article highlighting important details and grouping related concepts into broad themes. Combining the two approaches allowed the study to provide deeper, context-rich insights in addition to numerical trends, leading to a more complete understanding of the findings.

IV. FINDINGS & DISCUSSIONS

4.1 Profile of Respondents

Findings from table 1 provide a clear view of the demographic composition among the 389 respondents from the College of Business Education (CBE). Female participants account for 54%, while males make up 46%, reflecting a balanced gender distribution. The age distribution shows a predominantly young population, with 27.2% aged between 16-20 and 30.3% in the 21-25 range. Older age groups are also represented, with 18% aged between 26-30, 14.1% aged between 31-35, and 10.3% aged 36 and above. Regarding educational attainment, most respondents are pursuing or have

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completed a bachelor's degree, making up 69.2% of the sample. Others hold certificates at 19%, diplomas at 9.3%, postgraduate diplomas at 1%, and master's degree at 1.5%. This demographic overview reflects a diverse group of learners, both young and mature, with varying academic backgrounds which could influence their readiness and attitudes toward embracing new educational technologies.

Table 1

General Respondents Information (n=389)

Demographic	Category	Frequency	Percentages (%)
Gender	Male	179	46.0
	Female	210	54.0
	Total	**389**	**100**
	16-20 years	106	27.2
	21-25 years	118	30.3
Age	26-30 years	70	18.0
	31-35 years	55	14.1
	36 years and above	40	10.3
	Total	**389**	**100**
Education Level	Certificate	74	19.0
	Diploma	36	9.3
	Bachelor	269	69.2
	Postgraduate Diploma	4	1.0
	Masters	6	1.5
	Total	**389**	**100**

4.2 Factors Influencing Students' Shift from Traditional Methods to Robotic-Assistive Approaches

4.2.1 Reasons to Shift from Traditional Learning Methods to Robotic Tools

The study set out to explore the reasons students are moving away from traditional learning methods in favor of robotic tools. To get to the bottom of this, researchers presented participants with a series of focused questions. The data collected from these responses is presented in Table 2.

Table 2

Reasons to Shift from Traditional Learning Methods to Robotic Tools (n=389)

Statement	Frequency	Percent
Easier access to resources	112	28.8
Better engagement and interaction	86	22.1
Adaptability to personal learning needs	106	27.2
Encouragement from instructors	85	21.9
Total	**389**	**100**

Table 2 shows that the main reason students turned to robotics tools, chosen by 28.8% of respondents was the easier access to learning materials. Instead of spending a lot of time searching through textbooks or lecture notes, students could quickly find the information they needed. This observation is supported by recent research, which indicates that technology enhanced learning environments greatly reduce the time required retrieve information compared to traditional methods (Hu et al., 2025). Almost as important, 27.2% of participants highlighted the flexibility of these tools. Students were able to learn at their own style and in ways that suited their individual preferences, rather than being restricted to a single uniform approach. Research shows that systems that adapt to learners' needs increase both satisfaction and performance by customizing content for each individual (Contrino et al., 2024). These findings suggest that both quick access to information and personalized learning experiences play an important role in keeping students engaged and supporting their learning progress effectively.

22.1% of respondents reported that robotics made learning more engaging and less repetitive, largely because of interactive features and instant feedback which seemed to increase their motivation. Previous research by Li et al., (2024) supports this, showing that interactive technologies are linked to higher motivation and deeper cognitive involvement. This heightened engagement may be key to encouraging the long-term use of robotic tools in education. About 22% of students highlighted the influence of instructor support. When lecturers recommended or incorporated these tools into their lessons, students felt more confident and willing to try them. This finding aligns with research by Dehghani and Mashhadi (2024), who observed that instructor endorsement strongly shapes students' readiness to adopt

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new educational technologies. These results indicate that factors such as ease of use, personalized learning, student engagement, and lecturer support work together to encourage the shift toward robotic-assisted learning.

4.2.2 Challenges When Transitioning to Robotic Tools

The researchers aimed to explore the specific challenges that students encountered while adapting to robotic tools. To gather more insights, they posed a series of targeted questions to the students. The results, along with more detailed responses, can be seen in Figure 1.

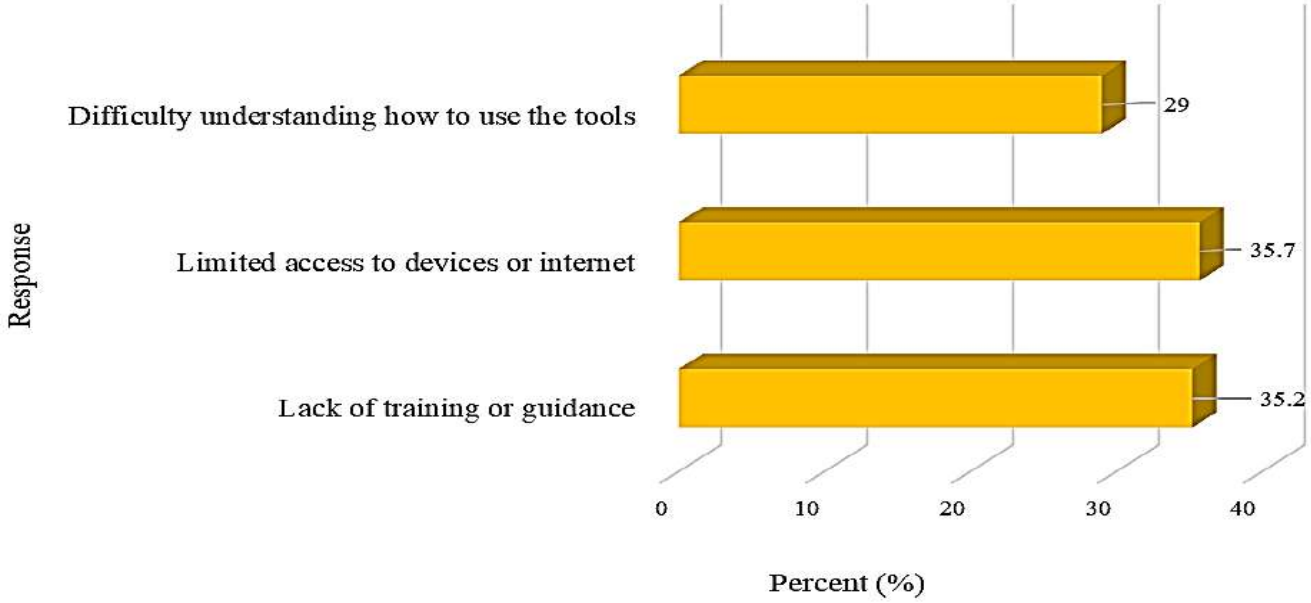

Figure 1
Challenges When Transitioning to Robotic Tools

Moving from traditional textbooks to robotic learning tools has not been easy for students, as Figure 1 illustrates. Only 35.2% received sufficient training, around 35.7% faced difficulties with devices and internet access, and 29% struggled to understand the new technology. These challenges are not entirely new, as previous research by Abuali and Ahmed (2025), identified poor training and weak infrastructure as major barriers to incorporating technology in education. It is therefore not surprising to see similar issues appearing in this context. Many students initially felt overwhelmed, not frustrated, or even left behind, particularly in areas where reliable internet or devices were limited. Without proper guidance to engage, while others simply did not have the necessary resources to participate. Despite these obstacles, the situation is not without hope. With persistence and adequate support, many students have been able to overcome these challenges. As one participant reflected,

> *"Initially, the process of adjusting to robotic tools provided to be challenging, leaving me feeling overwhelmed; however, I have since improved my grades and gained greater confidence in my skills." (Student, Interview Session, April 2025)*

This progression is quite common, as initial uncertainty often shifts toward greater proficiency when students become familiar with new technologies. Research by Cantutay and Taganas (2024), shows that regular engagement and hands-on use of digital tools significantly improve both technological skills and academic performance. In this case, consistent use of robotic tools not only made them a part of students' daily routines but also helped make their study habits more organized, effective, and enjoyable. The benefits went beyond better grades, as students also reported feeling more confident and capable when using technology. One respondent shared,

> *"I required training to utilize the tools effectively. After I grasped how to operate them, my reading speed increased, and I also noticed an enhancement in my comprehension..." (Student, Interview Session, April 2025)*

Accounts like these highlight the important impact that well-planned training and practical experience can have. Mastery of new educational tools does not happen instantly; students need chances to explore and learn through direct involvement. This idea is supported by recent research (Saparbayeva et al., 2024), which shows that structured training programs can accelerate learning and lead to clear academic improvements. In the context of this study, providing focused training initiatives seems to be an effective way to address the challenges students face during the transition.

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While the initial adjustment period may feel intimidating, having access to proper resources and ongoing support can make the long term benefits of robotic-assisted learning far outweigh the early.

4.2.3 Comparison between the Effectiveness of Robotic Tools and Traditional Methods

The main objective of this research was to assess the efficacy of robotic instruments relative to conventional educational methods. Participants answered a set of questions, and the data obtained are displayed in Table 3.

Table 3

Comparison between the Effectiveness of Robotic Tools and Traditional Methods (n=389)

Statement	Frequency	Percent
More effective	142	36.5
Equally effective	122	31.4
Less effective	125	32.1
Total	**389**	**100**

According to Table 3, students have differing opinions about robotic tools compared to traditional teaching methods. Around 36.5% of respondents stated that robotic tools are more efficient than traditional methods. This result is in line with research by Su and Zou (2024), which highlights that using technology improves understanding and memory. The findings imply that the preference for robotics is backed by quantifiable cognitive advantages and is not just a fad.

About 31.4% of students believe that both robotic and traditional approaches are equally successful. According to Ghofur (2025), this balanced perspective could be influenced by things like familiarity or the work required to get used to new technologies. The finding suggests that often students judge educational tools based on comfort and personal experiences. However, 32.1% of students still prefer traditional approaches, presumably due to the controlled teacher-led setting they offer. For some students, such environments can feel more reliable and less mentally demanding (Kundu & Das, 2025). This demonstrates that not every student is equally prepared or eager to use cutting edge technology in the classroom.

Overall, the findings indicate that the three viewpoints are nearly evenly divided, which reflects the continuing discussion regarding the relative merits of technology and traditional teaching methods. Although many students recognize the advantages of robotics, a sizable portion still favors or values traditional teaching methods. This diversity of viewpoints demonstrates the broad range of beliefs regarding what constitutes effective learning.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study showed that robotics is beginning to change how students at CBE learn. Students appreciated the flexibility, interactivity, and personalization offered by robotics, and many reported improved academic outcomes. Although, barriers such as limited access to devices, lack of training, and unequal opportunities remain major challenges. Though robotics can enhance education, it should not fully replace traditional teaching. A balance is needed so that students benefit from technology while also developing independence and critical thinking.

5.2 Recommendations

For robotics to be successfully integrated into education, institutions must ensure that every student has fair access. Both instructors and students need ongoing training to build confidence and skills in using robotics. At the same time, robotics should be used into teaching in a way that complements, rather than replaces, traditional methods. Policymakers and higher learning bodies should regularly review the effectiveness of robotics in education and address challenges as they arise. Lastly, future research should explore sustainable models for robotics adoption in contexts with limited resources.

REFERENCES

Abuali, T., & Ahmed, A. A. (2025). Challenges and opportunities in implementing e-learning in developing countries. *The Open European Journal of Social Science and Education (OEJSSE)*, 1(1), 1–12.

Adeoye, M. A. (2024). Mastering the basics: A guide to research methodology for effective writing and publication. *Chalim Journal of Teaching and Learning*, 4(1), 30–41.

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Aderibigbe, A. O., Ohenhen, P. E., Nwaobia, N. K., Gidiagba, J. O., & Ani, E. C. (2023). Artificial intelligence in developing countries: Bridging the gap between potential and implementation. *Computer Science & IT Research Journal*, 4(3), 185–199.

Anggraini, F., Meutia, S., & Irwansyah, D. (2025). Analysis of the influence of student decisions in using artificial intelligence (AI) as a learning reference. *Jurnal Sistem Teknik Industri*, 27(3), 236–246.

Arocena, I., Huegun-Burgos, A., & Rekalde-Rodriguez, I. (2022). Robotics and education: A systematic review. *TEM Journal*, 11(1), 379–385.

Bhatia, A., Bhatia, P., & Sood, D. (2024). Leveraging AI to transform online higher education: Focusing on personalized learning, assessment, and student engagement. *International Journal of Management and Humanities (IJMH)*, 11(1), 1–5.

Bowman, W. M. (2023). Tanzania: Technological lessons from the past. In *Digital development in East Africa: The distribution, diffusion, and governance of information technology* (pp. 81–112). Springer.

Cantutay, Z., & Taganas, W. R. (2024). Computer upskilling trainings and teachers' technological literacy: Basis for technological skills enhancement plan. *American Journal of Arts and Human Science*, 3(2), 215–240.

Casheekar, A., Lahiri, A., Rath, K., Prabhakar, K. S., & Srinivasan, K. (2024). A contemporary review on chatbots, AI-powered virtual conversational agents, ChatGPT: Applications, open challenges and future research directions. *Computer Science Review*, 52, 100628.

Contrino, M. F., Reyes-Millán, M., Vázquez-Villegas, P., & Membrillo-Hernández, J. (2024). Using an adaptive learning tool to improve student performance and satisfaction in online and face-to-face education for a more personalized approach. *Smart Learning Environments*, 11(1), 1–6.

Dehghani, H., & Mashhadi, A. (2024). Exploring Iranian English as a foreign language teachers' acceptance of ChatGPT in English language teaching: Extending the technology acceptance model. *Education and Information Technologies*, 29(15), 19813–19834.

Ghofur, A. (2025). From classroom to sustainability: The impact of AI-integrated educational robotics. In *Innovations in Educational Robotics: Advancing AI for Sustainable Development* (pp. 221–234). IGI Global Scientific Publishing.

Hu, L., Zhang, W., & Lin, P. (2025). Can the utilization of technology-enhanced learning spaces lead to improved learning outcomes? A meta-analysis based on 39 experimental and quasi-experimental studies. *Interactive Learning Environments*, 33(4), 3052–3072.

Izah, S. C., Sylva, L., & Hait, M. (2023). Cronbach's alpha: A cornerstone in ensuring reliability and validity in environmental health assessment. *ES Energy & Environment*, 23, 1050–1057.

Kennedy, I. (2022). Sample size determination in test-retest and Cronbach alpha reliability estimates. *British Journal of Contemporary Education*, 2(1), 17–29.

Kundu, S., & Das, M. (2025). A comparative study of learning outcomes of self-directed and instructor-led learning for postgraduate students in an Indian B-School. *Journal of Education for Business*, 100(1), 22–34.

Lai, C. L. (2021). Exploring university students' preferences for AI-assisted learning environment: A drawing analysis with activity theory framework. *Educational Technology and Society*, 24(4), 1–15.

Lambert, L. S., & Newman, D. A. (2023). Construct development and validation in three practical steps: Recommendations for reviewers, editors, and authors. *Organizational Research Methods*, 26(4), 574–607.

Li, Y., Chen, D., & Deng, X. (2024). The impact of digital educational games on student's motivation for learning: The mediating effect of learning engagement and the moderating effect of the digital environment. *PloS One*, 19(1), e0294350.

Licardo, J. T., Domjan, M., & Orehovački, T. (2024). Intelligent robotics—A systematic review of emerging technologies and trends. *Electronics*, 13(3), 535–542.

Liesa-Orús, M., Latorre-Cosculluela, C., Sierra-Sánchez, V., & Vázquez-Toledo, S. (2023). Links between ease of use, perceived usefulness and attitudes towards technology in older people in university: A structural equation modelling approach. *Education and Information Technologies*, 28(3), 2419–2436.

Mai, V., Vanderborght, B., Haidegger, T., Khamis, A., Bhargava, N., Boesl, D. B. O., Gabriels, K., Jacobs, A., Moon, A. J., & Murphy, R. (2022). The role of robotics in achieving the United Nations sustainable development goals—the experts' meeting at the 2021 IEEE/RSJ IROS workshop [industry activities]. *IEEE Robotics & Automation Magazine*, 29(1), 92–107.

Nie, J., Yuan, Y., Chao, X., Li, Y., & Lv, L. (2024). In smart classroom: Investigating the relationship between human–computer interaction, cognitive load and academic emotion. *International Journal of Human–Computer Interaction*, 40(13), 3528–3538.

Rahman, M. M. (2023). Sample size determination for survey research and non-probability sampling techniques: A review and set of recommendations. *Journal of Entrepreneurship, Business and Economics*, 11(1), 42–62.

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Rakhmanina, A., Pinchuk, I., Vyshnyk, O., Tryfonova, O., Koycheva, T., Sydorko, V., & Ilienko, O. (2022). The usage of robotics as an element of STEM education in the educational process. *IJCSNS International Journal of Computer Science and Network Security*, 22(5), 645–651.

Rane, N., Choudhary, S., & Rane, J. (2024). Education 4.0 and 5.0: Integrating artificial intelligence (AI) for personalized and adaptive learning. *Journal of Artificial Intelligence and Robotics*, 1(1), 29–43.

Ratnawati, A. T., & Darmanto, S. (2023). Role of attitude and intention on the relationship between perceived ease of use, perceived usefulness, trust, and e-tax system behavior. *Global Business & Finance Review (GBFR)*, 28(7), 89–104.

Reddy, K. G., & Khan, M. G. M. (2023). Constructing efficient strata boundaries in stratified sampling using survey cost. *Heliyon*, 9(11), Article e22118.

Safonov, Y., Usyk, V., & Bazhenkov, I. (2022). Digital transformations of education policy. *Baltic Journal of Economic Studies*, 8(2), 127–136.

Saparbayeva, E., Abdualiyeva, M., Torebek, Y., Madiyarov, N., & Tursynbayev, A. (2024). Leveraging digital tools to advance mathematics competencies among construction students. *Cogent Education*, 11(1), 2319436.

Soori, M., Dastres, R., Arezoo, B., & Jough, F. K. G. (2024). Intelligent robotic systems in Industry 4.0: A review. *Journal of Advanced Manufacturing Science and Technology*, 4(3), Article 2024007.

Su, F., & Zou, D. (2024). A comparative review of technology-assisted and non-technology concept mapping-based language learning. *International Journal of Educational Research Open*, 6, 100319.

Sweller, J. (2023). The development of cognitive load theory: Replication crises and incorporation of other theories can lead to theory expansion. *Educational Psychology Review*, 35(4), Article 95.

Uslu, N. A., Yavuz, G. Ö., & Usluel, Y. K. (2023). A systematic review study on educational robotics and robots. *Interactive Learning Environments*, 31(9), 5874–5898.

Zhang, D., Wang, J., Jing, Y., & Shen, A. (2024). The impact of robotics on STEM education: Facilitating cognitive and interdisciplinary advancements. *Applied and Computational Engineering*, 69(1), 7–12.

Zhang, Y., & Zhu, Y. (2024). Effects of educational robotics on the creativity and problem-solving skills of K-12 students: A meta-analysis. *Educational Studies*, 50(6), 1539–1557.

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Passengers with disabilities encountered challenges in the bus rapid transit (BRT) system: A case study of Dar es Salaam Rapid Transit (DART), Tanzania

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ABSTRACT

This study assessed the inclusivity of the Dar es Salaam Bus Rapid Transit (DART) system by examining how its physical conditions support passengers with disabilities. The objective was to evaluate key infrastructural elements – ramps, wheelchair-friendly stations, and accessible seating – and analyse staff preparedness and passenger experience using the Theory of Planned Behaviour and Service Quality Theory. A mixed approach and descriptive cross-sectional research design was used, employing stratified random sampling of 178 Dar es Salaam Rapid Transit (DART) staff and purposive sampling for five zonal station leaders and snowball sampling for selecting 100 passengers with disabilities. Data were collected through structured questionnaires and analysed using SPSS (Version 26). Quantitative findings were presented through descriptive statistics, while narrations presented the qualitative findings that were analysed through content analysis. The findings reveal that while some inclusive infrastructure such as ramps and reserved seating exists, functionality is compromised by poor design, maintenance gaps, signage deficiencies, and lack of enforcement. Additionally, training among frontline staff is inconsistent and inadequate, further impeding service delivery. The study concludes that Dar es Salaam Rapid Transit (DART) had to deliver transport that is equitable and inclusive for people with disabilities. The recommendations were made on the provision of regular staff training, improvements in accessibility features, and stronger enforcement of inclusive policies.

Keywords: Accessibility, Bus Rapid Transit, Disability, Inclusivity, Infrastructure, Public Transport

I. INTRODUCTION

Public transportation as the dominant mode of urban mobility, its accessibility to disabled individuals has become a very serious problem (Cao & Shahraki, 2023). Bus Rapid Transit (BRT) is a solution to urban congestion and sustainable transport system(Medeiros et al., 2024). Brazil and Colombia have shown in their case cities that BRT networks can reduce times spent on transit, rewrite environmental scores and lead to potentially positive consequences when properly integrated into the urban networks (Medeiros et al., 2024; Ardila, 2020). However, BRT networks have yet to secure the rights of passengers with disabilities, as most cities are neither offering accessible infrastructure solutions nor sufficient service provision methods (Mwesigwa et al., 2024).

In developed areas, while the BRT physical environment appears to be advanced; key attributes of it including ramps, priority seats and audio announcements are underdesigned or absent hence impeding disabled person's independence (Alnsour, 2023; Malekzadeh & Chung, 2020). Inclusive urban development is complicated linked to accessibility to public transport. African counterparts in Lagos and Johannesburg had yielded positives for reduced travel time and employment access, but are struggling to cater to the needs of people with impairment due to some form of infrastructure inadequacies coupled with low disability consciousness among workers(Mwesigwa et al., 2024).

Dar es Salaam Rapid Transit (DART) was launched in 2016 in Tanzania to provide the nation's first BRT service to replace daladala and reduce traffic congestion, as well as save time(Joseph et al., 2021). Despite these objectives, Dar es Salaam Rapid Transit (DART) continues to have operating problems that affect passengers who are disabled. (Park & Chowdhury, 2022) emphasize a physical barrier such as an absence of ramps on raised platforms, vast size gaps between the platforms, deficient in an audio system. In addition, a great portion of BRT staffs have not received adequate training to assist disabled commuters and little attention is given for accommodating mobility-impaired clients (Tengecha & Juma, 2021).

Inclusive legal and policy environments are necessary to promote fair access(Johnson et al., 2025). In spite of Tanzania's Persons with Disabilities Act (2010) and the global campaign for inclusion in urban mobility such as SDG 11, implementation gaps continue to exist on the ground in terms of infrastructure and service delivery through the Dar es salaam Rapid Transit (DART) system (Mchome & Nzoya, 2023). The study sought to assess inclusivity of the Dar es Salaam Rapid Transit (DART) system by examining how its physical conditions support passengers with disabilities.

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1.1 Statement of the Problem

Passengers with disabilities face inadequate experiences on the Dar es Salaam Rapid Transit (DART) system because of operational difficulties that generate extended waiting times and congestion that worsen travelling comfort. The BRT scarce priority services, social discrimination and inadequate public attention worsen the situation. Despite other research examining the larger socioeconomic implications of the BRT system in Dar es Salaam (Juanita et al., 2023; Mwesigwa et al., 2024) not much has been written specifically how the system serves passengers with disabilities. Representatives of this school, such as (Krüger et al., 2021; Mchome & Nzoya, 2023; Msangi et al., 2025) lay emphasis on the role of accessibility but do not examine infrastructure and service practices particular to Dar es Salaam Rapid Transit (DART). This study aims to address the gap by assessing the passengers with disabilities inclusivity in BRT transportation services in Dar es Salaam with a particular concern on how the BRT system physical conditions support the passengers with disabilities.

1.2. Research Question

How does the Bus Rapid Transit system (BRT) physical conditions support passengers with disabilities in Dar es Salaam?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study adopts Theory of Planned Behaviour (TPB) to describe behavioural variables that informs the interaction and support of passengers with disabilities by Dar es Salaam Rapid Transit (DART) staff. Theory of Planned Behaviour (TPB), introduced by (Ajzen, 1991) assumes that behaviour is contingent upon three major components, including attitude (what an individual thinks of the behaviour), subjective norms (what others think of the behaviour), and perceived behavioural control (whether the individual can perform the behaviour). Within Dar es Salaam Rapid Transit (DART), Theory of Planned Behaviour (TPB) is applied to study staff members' attitude towards serving disabled passengers, how they perceive the social expectation in their workplace and their confidence to attend to disability needs. Similarly, Theory of Planned Behaviour (TPB) is helpful to assess how passengers' inclusivity attitudes, perceptions, and perceived control were over accessing services with Dar es Salaam Rapid Transit (DART)'s accessibility features.

The Service Quality Theory (SQT), developed by Parasuraman et al., (1985) was also adopted to focus on the difference between customer expectations and perception of the actual received service. The Service Quality Theory (SQT), was essential in identifying potential service provision gaps (Parasuraman et al., 1985; Rejikumar et al., 2019) . The Service Quality Theory (SQT) emphasises the five key dimensions of service quality, including reliability, responsiveness, assurance, empathy, and tangibility, to help assess the effectiveness of overall service delivery and customer satisfaction(Parasuraman et al., 1985). The Service Quality Theory (SQT) is important in assessing the efficiency and effectiveness of the BRT system's physical features such as ramp, signage, audio announcements and stations design. It facilitates a methodical examination of the physical facets of infrastructure and the compassion and aid provided by Dar es Salaam Rapid Transit (DART) workers. In combination, Theory of Planned Behaviour (TPB) and Service Quality Theory (SQT) offer a two-pronged approach to explain both behavioural and physical features of the service dimensions, providing a comprehensive evaluation of the inclusivity of the Bus Rapid Transit system.

2.2 Empirical Review

It also emerged through several international surveys that the physical accessibility of persons with disabilities in public transport is particularly low, namely for BRT systems. (Levine & Karner, 2023) studied U.S. transportation accessibility policy, finding that these policies are often "minimum compliance" requirements, and do not recognize the physical or physiological travel needs of passengers with disabilities other than medical conditions. To change planning culture, they emphasized disability-inclusive planning and community participation. In Europe, (Alçura, 2025) identified major barriers in BRT infrastructure including inadequate boarding and limitations on wheelchair access. The analysis indicated that implementation of accessibility standards should be better enforced and infrastructure retrofitted. However, in Asia (Tennakoon et al., 2020) observed Station misdesign and bus-only construction limited how persons with disabilities could access Bus Rapid Transit service. The recommendation was made on the need to incorporate diverse disability perspectives, closing data gaps, and prioritizing equity-based policies to enhance transportation accessibility for all.

In Africa, investigation was made by (Hotor, 2024) on the accessibility and use of public transport services by persons with disabilities (PWDs) in Ghana, with a focus on BRT systems. Using qualitative interviews and observational analysis, the study revealed that many BRT stations and vehicles lack adequate physical accessibility features, including ramps and tactile paving. Moreover, the conclusion was made by that research that the lack of accessible transport

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options contributes to social exclusion and recommended comprehensive policy reforms and investments in disability-friendly infrastructure.

(Lawrence et al., 2024) analysed the integration of non-motorised transport (NMT) in South Africa's Harambee BRT system to assess its inclusivity for people with disabilities. According to the findings by Lawrence et al., 2024), who utilised qualitative interviews and field observations, although there were some improvements still the physical barriers, such as inadequate ramp access and ineffective tactile guidance, remain a challenge to people with disabilities to access the service. The conclusion was made on the need for improving the physical infrastructure, and providing regular accessibility audits could enhance the mobility of people with disabilities.

In Tanzania, (Malume et al., 2024) assessed the passengers satisfaction in using Bus Rapid Transit stations and buses in Tanzania, focusing on Dar es Salaam, simple random and purposive sampling were employed among of respondents, and observations on station facilities. The findings disclosed the presence of a deficiency in accessibility features, including the majority of the stations lacked elevators, poorly maintained ramps, and lacked space for wheelchairs. The buses were not designed in a way to be accessible for all types of disabilities. Malume et al., 2024 emphasised the need to address the existing shortfalls of the BRT system in Dar es Salaam for the effective inclusion of passengers with disabilities into the public transport system

III. METHODOLOGY

3.1 Research Approach and Design

The mixed approaches were employed to assess the inclusivity of BRT system transportation services in meeting the satisfaction needs of passengers with disabilities. Quantitative approach enabled gathering of numerical data on accessibility, staff training and passenger experience to understand the effects on DART system user satisfaction (Ghanad, 2023). Qualitative approach focused on getting data concerning the personal experiences and gaining a deeper understanding of the challenges through the interviews with Dar es Salaam Rapid Transit Zonal station Leaders. The descriptive research design was deployed to describe the characteristics of a phenomenon or groups without influencing the outcome or manipulating variables. The descriptive research design was engaged to enable presenting the comprehensive overview of the current state of affairs, nature of training provided, physical accessibility, and experiences of passengers with disabilities (Ansari et al., 2022). Furthermore, the selected design evaluated the current accessibility conditions relative to the needs and experiences of passengers with disabilities at a specific moment.

3.2 Study Population

The population was made up of two strata, including 325 Dar es Salaam Rapid Transit (DART) employees distributed into 5 zonal station Leaders, 320 service assistants, and 100 passengers with disabilities. The selected employees were vital to be considered in the study at hand, as they are in the operations of Dar es Salaam Rapid Transit (DART) services since they are in charge of the ticketing process, guide passengers, and ensure smooth flow of activities at the stations. Also, the second strata was made up by passengers with disabilities, comprised of physical, sensory, and mobility impairments, using the Dar es Salaam Rapid Transit (DART) for transportation. Despite their actual population size remaining unknown, their experiences and satisfaction in using the Dar es Salaam Rapid Transit (DART) system were key in assessing the inclusiveness of the service provision.

3.3 Sample Size and Sampling Methods

Both probability and non-probability sampling methods were employed in the study to guarantee probability data. The sample size of 178 Dar es Salaam Rapid Transit (DART) employees was drawn by a stratified random sampling representation. The five zonal leaders as key informants were selected through purposive sampling, and 100 passengers with disabilities were identified using snowball sampling (Leah, 2024) as the population size was unknown, and the location was challenging to find. This multi-method approach enabled multifaceted and relevant outlooks within all stakeholder groups.

3.4 Data Collection Instruments

Questionnaires and semi-structured interviews constituted the main tools employed in data collection. Questionnaires, which were designed using 5-point Likert frameworks and translated into Swahili language, provided information concerning staff training, physical accessibility, and passenger satisfaction. They were given to both employees and travellers to gauge perceptions of the inclusivity of service delivery. The five zonal leaders were interviewed to discuss managerial insights on accessibility protocols and challenges through semi-structured interviews. Combined use of these tools provided both numerical and experiential data, which contributed to the mixed-method approach in the study.

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3.5 Data Analysis and Processing

The questionnaire data were quantitatively analysed with the SPSS software as descriptive statistics (frequencies, percentages, mean scores, standard deviations). In the case of qualitative data, the content analysis involved a narrative method by sorting transcripts of interviews based on themes related to the research purpose. The combination of the two methodologies enabled a more complete set of results to be revealed indicative of the statistic patterns and in the specifics of personal experiences, as pertinent to physical accessibility within the Dar es Salaam Rapid Transit (DART) system.

IV. FINDINGS & DISCUSSION

4.1 Bus Rapid Transit System Physical Conditions features to Support the Passengers with Disabilities

The main objective was to assess the BRT system physical conditions to support passengers with disabilities in Dar es Salaam. The attributes such as Ramp availability, wheelchair friendly and Accessibility of seating arrangement were assessed.

*Ramp Availability***:** The availability and functionality of ramps of BRT stations regarding experiences of passengers with disabilities was examined. Ramps were among the essential infrastructure for ensuring access and mobility, especially for individuals with physical impairments. Based on that stance to understanding ramps design, usability, and visibility is key to evaluating the inclusivity of the BRT infrastructure as presented in Table 1.

Table 1

Ramp Availability (n=178)

Ramp Availability	Mean	Std. Dev.	Interpretation
The ramps at BRT stations are designed with the needs of disabilities passengers in mind.	3.93	0.782	Agree
The slope of the ramps allows for safe and easy movement.	2.15	1.058	Disagree
Ramps are accessible at all points of entry and exit in BRT stations.	4.14	0.682	Agree
Adequate signage directs passengers to ramp locations.	2.68	0.863	Neutral
The ramps remain usable during peak hours and crowded conditions.	3.81	0.775	Agree

The findings indicated the level of respondents agree that ramps at BRT stations are designed with the needs of passengers with disabilities possessed the mean score of 3.93. Nonetheless, the findings revealed that the ramps were accessible at all key entry and exit points was found with a mean of 4.14 and the status of ramps to be usable even during peak hours held the mean of 3.81. Seemingly, the convenience of the slope of the ramps was with the low mean score of 2.15, reflecting disagreement that the incline is appropriate for safe and easy use. Additionally, neutral findings on the mean of 2.68 were obtained on visibility and adequacy of signage directing passengers to ramp locations.

Key informant interviews with Dar es Salaam Rapid Transit (DART) zonal leaders were conducted to gather expert views guided by the question of how they would assess the current physical accessibility features of Dar es Salaam Rapid Transit (DART) stations and buses for people with disabilities. Respondent from Zone A explained:

> *"...Some stations have ramps and markings, but not all. At peak hours, even the ramps are blocked by crowds or parked carts. It's not always practical for wheelchair users."* (Interview, Respondent A, 12/06/2025)

Wheelchair-Friendly Bus Stations

An exploration was made on how passengers with disabilities perceive the overall wheelchair accessibility of BRT stations. Key structural features such as station layouts, boarding platforms, and support facilities like elevators provide a safe and efficient environment for wheelchair users within the public transport system, and the findings are shown in Table 2

Table 2

Wheelchair-Friendly Bus Stations (n=178)

Wheelchair-Friendly Bus Stations	Mean	Std. Dev.	Interpretation
BRT stations accommodate wheelchairs without causing delays for other passengers.	1.90	0.628	Disagree
The design of bus stations prioritizes the safety of wheelchair users.	2.15	0.821	Disagree
Pathways within bus stations are wide enough for wheelchair manoeuvrability.	4.04	0.567	Agree
Wheelchair users face no obstacles when entering or exiting BRT buses.	1.97	0.784	Disagree
Facilities like elevators and ramps are in good working condition for wheelchair users.	1.95	0.687	Disagree

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The results indicated that there were substantial deficiencies in the support of BRT stations for people who use wheelchair, and strongly disagreed standard had a mean score of 1.90 for 'stations accommodate wheelchairs without causing delay to others. Mean disagreed value of 2.15 was observed on prioritization of safety in design at stops for wheelchair users. Moreover, passengers against mean score of 1.97 opinion that wheelchair users do not have problem when boarding (alighting) public haulages and also that vital facilities such as elevators and ramps are in proper working order had the mean score value of 1.95. Additionally, the availability of station pathways for turning wheel chairs around was rated as a mean of 4.04.

The other interview item was about what is the main hindrance people with disabilities experience in obtaining Dar es Salaam Rapid Transit (DART) service. The quote shows only a limited support for accessibility, unsupported by both user preferences and utility design. Some infrastructure is there, but it is being silent by a failure to control crowds and manage space. Inconsistent designs between stations make access difficult. Respondent from Zone B stated:

> "…*Elevators and lifts in some stations do not regularly work, and there isn't a sign or any information to show you an alternative. "As myself, and many people over 50 are finding — stiffness really does start to set in with or without exercise on a regular basis" — this fact is indeed hard for those with mobility issues."* (Interview, Respondent B, 12/06/2025)

The lack of, or the failure of, ancillary equipment (e.g. elevators) significantly limits access by passengers with disabilities—especially when alternate routes are not apparent. Respondent from Zone C added:

> *"… Most buses lack low floors, and drivers are not trained to assist with boarding. "With a lot of people using walkers or crutches, it's not conducive to getting in easily."* (Interview, Respondent C, 13/06/2025)

Accessible Seating Arrangements

Attribute of accessibility and usability of designated seating areas for passengers with disabilities aboard BRT buses. Findings captured respondents' views on seat identification, space, and maintenance, ease of access and benefit of the reserved spaces during their journeys and the findings are shown in Table 3.

Table 3

Accessible Seating Arrangements (n=178)

Accessible Seating Arrangements	Mean	Std. Dev.	Interpretation
Designated seating for passengers with disabilities is easily identifiable.	4.12	0.700	Agree
Enough space for passengers with disabilities to comfortably access seating.	2.16	0.861	Disagree
Accessible seats are always kept vacant for eligible passengers.	2.13	0.837	Disagree
The location of accessible seating ensures quick entry and exit.	3.98	0.586	Agree
Designated seating is clean and well maintained.	2.18	0.770	Disagree

Pre-designated seating for passengers with disabilities were sign-posted and ideally positioned for convenient access and outlet was rated at an average of 3.98. On the seating, the mean score for _being adequate spacious was disagreed by most of the passengers, that is 2.16; with an exception made by consistently reserved for people with disabilities, and status of the area being kept clean and well-maintained at a mean of 2.18 (=0.730). In addition, responses to questions which aspects do you think should be improved during the test sessions were presented and demonstrated. The reply highlighted operational and maintenance shortfalls. Lack of implementation and public understanding resulted in poor seating principles, inadequate supervision and abuse, which negatively impacted the success of such facilities. Respondent from Zone E stated:

> *"...There are still tactile gaps and visual signage for the blind. The system for the most part accommodates physical mobility but not sensory disabilities."* (Interview, Respondent E, 14/06/2025)

This observation highlighted the inappropriate design of buses, which do not accommodate the needs of their users - not being able to board and disembark low floor buses, whose simply installed mechanical ramps are unusable with a mobility aid. Respondent from Zone D commented:

> *"...Some are already there; they're just not being honoured. They're used all the time by regular passengers, and there's no policing of them to keep them for people with disabilities."* (Interview, Respondent D, 13/06/2025)

The physical capacity evaluation results indicate that while some structural characteristics, namely ramps, reserved seating and wide walkways, are in the Dar es Salaam Rapid Transit (DART) system; their operability has been considerably questioned due to poor design considerations, inadequate maintenance and lack of enforcement. Though there are ramps and the occasional seating area, many of them conveniently fall out of reach or recede during rush hours or at the hands of other passengers; key facilities such as elevators also happen to still be out order. This indicates that the physical environments of Dar es Salaam Rapid Transit (DART) system do not meet the needs of disabled passengers.

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Passenger Satisfaction with BRT Services

This sub-section considered the expectation and perception of the passengers with disabilities inclusivity of BRT transportation services in Dar es Salaam as shown in Table 4.

Table 4

Passenger Satisfaction with BRT services (n=100)

Passenger satisfaction	Mean	Std. Dev.	Interpretation
Accessible features are provided on BRT buses for passengers with disabilities.	2.21	0.880	Dissatisfied
Comfort and suitability of the seating arrangements for passengers with disabilities.	2.25	0.869	Dissatisfied
Assistance and training are demonstrated by BRT staff toward passengers with disabilities.	2.05	0.869	Dissatisfied
Smooth and convenient, the journey is when using BRT buses.	2.19	0.800	Dissatisfied
Clarity and visibility of signage that helps passengers with disabilities at BRT stations.	2.07	0.844	Dissatisfied
The BRT system meets my expectations for inclusivity and accessibility as a passenger with a disability.	2.32	0.863	Dissatisfied
Overall BRT services	2.23	0.897	Dissatisfied

Source: Field Data (2025)

The findings revealed the dissatisfaction among passengers with disabilities regarding various aspects of the BRT system in Dar es Salaam including the accessible features on buses (mean = 2.21), seating comfort and suitability (mean = 2.25), and the level of assistance and training presented by BRT staff (mean = 2.05), convenience of their journeys (mean = 2.19) and the clarity of signage at stations (mean = 2.07). Additionally, the findings on the overall impression of the BRT system were at dissatisfaction levels as it was not meeting the passengers with disabilities accessibility needs (mean = 2.32) and BRT services in general (mean = 2.23).

4.2 Multiple Linear Regression Model

Staff training, physical accessibility, and passenger experience on customer satisfaction among passengers with disabilities using the BRT system in Dar es Salaam jointly were assessed by using Multiple Linear regression as presented in table 4.

Table 4

Multiple Linear Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.660[a]	.435	.417	.38555	.258

a. Predictors: (Constant), Passenger Experience, Physical Accessibility, Staff Training

b. Dependent Variable: Satisfaction

The model summary showed that the correlation coefficient (R) was 0.660, which means that there was a strong to moderate positive correlation between the three predictors and the dependent variable, Passenger Satisfaction. The R Square of 0.435 required that 43.5 per cent of the variance in satisfaction be attributed to these three predictors. The adjusted R Square (0.417) strongly supported the model despite the prediction adjustment. In addition, Durbin-Watson was 0.258, indicating some apprehension regarding autocorrelation in the residuals, which might influence confidence in the predictions and therefore needs further investigation

4.3 Analysis of Variance (ANOVA)

The ANOVA results revealed statistically significant results, as the F-value was 24.645, and the p-value was 0.000. Based on the findings, there was at least one independent variable (Staff Training, Physical Accessibility, or Passenger Experience) that significantly contributed to the variation in the satisfaction level. The P-value of less than 0.05 was evidence that the regression model fitted to the observation of relationships was not likely to be caused by chance, as shown in Table 5

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Table 5

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.990	3	3.663	24.645	.000[b]
	Residual	14.270	96	.149		
	Total	25.260	99			

a. Dependent Variable: Satisfaction

b. Predictors: (Constant), Passenger Experience, Physical Accessibility, Staff Training

4.3.1 Multiple Regression Analysis Coefficients

The regression coefficients indicated that three predictors had a statistically significant negative effect on passenger satisfaction, as shown in Table 6. The coefficient for staff training was -1.027 (p = 0.004), suggesting that inadequate or ineffective staff training is associated with a decrease in satisfaction of passengers with disabilities. Similarly, physical accessibility possessed the coefficient of -0.622 (p = 0.001), indicating that poor physical conditions (e.g., ramps, elevators, or station design) negatively influenced passenger satisfaction. Passenger experience showed the coefficient of -1.238 (p = 0.000) and a beta weight of -0.504, indicating the strongest influential predictor in the model.

That means that negative passenger experiences, such as overcrowding, lack of assistance, or discomfort, had the greatest impact in reducing overall satisfaction with BRT services. Conclusively, negative coefficients for passenger experience, staff training, and physical accessibility strongly contributed to shortcomings, which resulted in much lower satisfaction, indicating that improvement is required.

Table 6

Multiple Regression Analysis Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.789	1.224		8.817	.000
	Staff Training	-1.027	.351	-.273	-2.921	.004
	Physical Accessibility	-.622	.188	-.277	-3.301	.001
	Passenger Experience	-1.238	.212	-.504	-5.828	.000

4.4 Discussion

The study discovered a significant gap between the intended accessibility of the BRT system and the experiences of individuals with disabilities, particularly in terms of infrastructure use and personnel help. The presence of ramps and appropriate seats is the most important element of acceptance, which is unfortunately counterbalanced by disregard, poor signage, and uneven adherence within specific stations. Passenger experience, physical accessibility, and staff training were also found to be negatively correlated with user happiness, according to the findings of the regression study. These findings indicate that, despite good intentions and some progress in infrastructure development, the Dar es Salaam Rapid Transit (DART) system still fails to provide a reliable and comfortable passenger journey for passengers with disabilities, necessitating systematic and long-term operational changes.

The researcher considered that the physical environment of a BRT system is important in conceptualizing access and usability to persons with disabilities. This research established that the Dar es Salaam Rapid Transit system had infrastructure, including ramps, designated seats and wheelchair access points which suggest inclusivity aspect in its nature though it was limited in terms of access (Andrew et al., 2022). (Mwaka et al., 2023) pointed out that the disabled people cannot deal with whole procedure including getting to or off the public transportation itself without any help of other persons due to several physical conditions, availability of space on narrow platform, audible sign and imperfect design of ramp. There seems to be a perception that these functionalities shape the UX (user experience). The similar conclusion, which comes from the research of (Liu et al., 2023) is that long time lost in crowded buses and disparities in infrastructure have been causing disabled users' high anxiety and low satisfaction.

Results regarding physical accessibility suggested the presence of ramps, as well as a relative ease to access the stations. However, that ramp was poorly sloped and very dangerous for people in wheelchairs and other mobility-limited. In addition, neutrality results from the sign-tapping task emphasized that passengers with disabilities had a communication barrier to find the ramps. Recommendations are made based on better signage, slope and universal design for easier usability and safety of the disabled passengers.

At the theoretical level, consistent with SQT, there was a schism between expectations (i.e. availability and comfort) and observations (i.e., functionality and enforcement inconsistency) which accounted for poor performance in empathy, assurance, and responsiveness scores. Similarly, the TPB concentrates on perceived behavior control; passengers with disabilities could also perceive themselves as disempowered due to being prevented from travelling because of infrastructural failures. At the very least, the researcher claims that when ramps or lifts are inoperable or

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blocked, security purposes for passengers with disabilities are threatened. The implications made by this paper concerning the need to foster the existence and sustainability of inclusive infrastructure from which an efficient, accessible transportation system that is able to adhere with national disability laws and international development major objectives can also be inferred.

Furthermore, the findings offered description on ramps -slopes being inconvenient for wheelchairs or seeing the signs that indicated accessibility or broken elevators, thus contradicting the overall inclusivity. Mchome and Nzoya (2023) found that although perceived accessibility of users had improved after the implementation of BRT in Dar es Salaam, it was not always adequate with regard to crowd control and for physical reach when using the service.(Munishi et al., 2021) observed that structural gaps continue to persist even if Tanzania has the legal and policy-enabling environment for inclusion of PWDs. However, it is recommended that the current physical and functional gaps be corrected as they not only limit mobility, but also contribute to feelings of dependency and loss of self-respect among people with disabilities.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

The purpose of this study was to assess how well Dar es Salaam's BRT public transportation system accommodates PWDs in terms of the physical environment. The findings indicate that some features of the infrastructures (ramps, designated seating, wide passage remains) have been put into place but with uneven implementation, inadequate maintenance and weak enforcement. Lifts and ramps are frequently out of order or unsafe, there is insufficient signage, and designated seating for disabled passengers has no precedence. These obstacles significantly reduce independence, confidence, and happiness for riders with disabilities. In addition, the results show that most users with disabilities of the senses are not well accommodated due to absence of path-through-touch or sound announcements. These limitations undermine the system's ability to offer an accessible and equitable service as stipulated in Tanzania disabilities policies and SDG 11. The research has established that the physical access fixing targets were partially met and there are important structural and operational changes required.

5.2 Recommendation

All operational staff should undergo mandatory, rather than supplementary and optional, practical, situation training based on disability awareness, renewed regularly to maintain knowledge and skills by Dar es Salaam Rapid Transit (DART) management. Station accessibility crews at key stations would assist customers with disabilities getting on, around and off the system in emergency mode. Ultimately, set and enforce scheduled maintenance, monitoring for accessibility infrastructure, with obvious accountability when not met.

For Policy Makers, the use of digital accessibility solutions such as real-time navigation aids and feedback services in the provision of urban transport should be enforced as a requirement to improve passenger safety, autonomy and independence. Require that urban transport projects are subjected to a full accessibility design review at each stage of the planning process so that not only is accessibility 'feature' present, but it works well, or user friendly and introduce regular public reporting on performance against access to train standards including customer satisfaction scores from passengers with disabilities – improve accountability and continuous improvement."

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alçura, G. A. (2025). On the road to inclusion: A multifaceted examination of transportation challenges faced by individuals with disabilities. *Sustainability (Switzerland), 17*(1). https://doi.org/10.3390/su17010081

Alnsour, M. A. (2023). Assessment of risks affecting the operational activities of the Amman bus rapid transit (BRT) system. *Alexandria Engineering Journal, 78*, 265–280. https://doi.org/10.1016/J.AEJ.2023.07.036

Andrew, L., Kitali, A. E., Sando, T., & Musagasa, J. (2022). Operational evaluation of the bus rapid transit system: Case study of Dar es Salaam city. *Journal of Public Transportation, 24*, 100020.

Cao, B., & Shahraki, A. A. (2023). Planning of transportation infrastructure networks for sustainable development with case studies in Chabahar. *Sustainability (Switzerland), 15*(6), 1–15. https://doi.org/10.3390/su15065154

Ghanad, A. (2023). An overview of quantitative research methods. *International Journal of Multidisciplinary Research and Analysis, 06*(08), 3794–3803. https://doi.org/10.47191/ijmra/v6-i8-52

Hotor, D. (2024). Accessibility and use of public transport services by persons with disabilities (PWDs) in Ghana. *[Journal Name Missing]*, *4*(02), 7823–7830.

Johnson, L. L., Ebakivie, O., Everett, J., & Wynn, S. (2025). Inclusive and accessible transportation for all: Strategies for integrating equity in transportation research. *Logistics, 9*(2), 1–29. https://doi.org/10.3390/logistics9020072

Licensed Under Creative Commons Attribution (CC BY-NC)

Joseph, L., Neven, A., Martens, K., Kweka, O., Wets, G., & Janssens, D. (2021). Exploring changes in mobility experiences and perceptions after implementation of the bus rapid transit system in Dar es Salaam. *Case Studies on Transport Policy, 9*(2), 930–938. https://doi.org/10.1016/J.CSTP.2021.04.012

Juanita, Suwarno, Sarifudin, M. I., & Setiawan, T. H. (2023). Potential development of Trans Central Java bus rapid transit (BRT) corridor in the Banyumas area towards sustainable mobility. *Automotive Experiences, 6*(1), 188–199. https://doi.org/10.31603/ae.8369

Krüger, F., Titz, A., Arndt, R., Groβ, F., Mehrbach, F., Pajung, V., Suda, L., Wadenstorfer, M., & Wimmer, L. (2021). The bus rapid transit (BRT) in Dar es Salaam: A pilot study on critical infrastructure, sustainable urban development, and livelihoods. *Sustainability (Switzerland), 13*(3), 1–30. https://doi.org/10.3390/su13031058

Lawrence, K., Trynos Gumbo, & Godfrey G. Musvoto. (2024). User experiences on the integration of non-motorized transport in public transport systems: A case of the Harambee bus rapid transit. *REAL CORP 2024 Proceedings/Tagungsband*, 1–12. https://doi.org/10.48494/REALCORP2024.9017

Leah, N. (2024). Types of purposive sampling. *[Journal Name Missing]*, *5*(1), 90–99.

Levine, K., & Karner, A. (2023). Approaching accessibility: Four opportunities to address the needs of disabled people in transportation planning in the United States. *Transport Policy, 131*, 66–74. https://doi.org/10.1016/J.TRANPOL.2022.12.012

Liu, L., Kar, A., Tokey, A. I., Le, H. T. K., & Miller, H. J. (2023). Disparities in public transit accessibility and usage by people with mobility disabilities: An evaluation using high-resolution transit data. *Journal of Transport Geography, 109*, 103589. https://doi.org/10.1016/J.JTRANGEO.2023.103589

Malekzadeh, A., & Chung, E. (2020). A review of transit accessibility models: Challenges in developing transit accessibility models. *International Journal of Sustainable Transportation, 14*(10), 733–748. https://doi.org/10.1080/15568318.2019.1625087

Malume, J. P., Meli, B. M., Mwisila, L. P., & Rwechungula, H. B. (2024). Workers' environment in promoting workers' satisfaction at Dar es Salaam Bus Rapid Transit in Tanzania. *IIARD International Journal of Economics and Business Management, 10*(4), 186. https://doi.org/10.56201/ijebm.v10.no4.2024.pg186.201

Mchome, E. E., & Nzoya, U. W. (2023). Users' perception of operation and performance of public transport systems in African developing countries: The case of bus rapid transit (BRT) in Dar es Salaam, Tanzania. *Open Journal of Applied Sciences, 13*(12), 2408–2420. https://doi.org/10.4236/ojapps.2023.1312188

Medeiros, R. M., Duarte, F., Bojic, I., Xu, Y., Santi, P., & Ratti, C. (2024). Merging transport network companies and taxis in Curitiba's BRT system. *Public Transport, 16*(1), 269–293. https://doi.org/10.1007/s12469-023-00342-7

Ansari, M. R., Rahim, K., Bhoje, R., & Bhosale, S. (2022). A study on research design and its types. *International Research Journal of Engineering and Technology (IRJET), 9*(7), 1132–1135.

Msangi, A. F., Lucian, A. C., Mwandepa, P., Mbatta, G., & Kutela, B. (2025). Safety evaluation of Dar es Salaam bus rapid transit facilities in accommodating non-motorists: A behavior study. *African Transport Studies, 3*, 100029. https://doi.org/10.1016/J.AFTRAN.2025.100029

Munishi, E. J., Hamidu, K. M., & Shayo, F. (2021). Factors constraining quality service provision in the BRT project in Dar es Salaam, Tanzania. *Open Journal of Social Sciences, 09*(11), 261–279. https://doi.org/10.4236/jss.2021.911021

Mwaka, C. R., Best, K. L., Cunningham, C., Gagnon, M., & Routhier, F. (2023). Barriers and facilitators of public transport use among people with disabilities: A scoping review. *Frontiers in Rehabilitation Sciences, 4*(January).

Mwesigwa, L., Yin, Z., & Farber, S. (2024). Evaluating the level of access and equity of the bus rapid transit (BRT) system: The case of Dar es Salaam, Tanzania. *Journal of Transport Geography, 119*, 103953. https://doi.org/10.1016/J.JTRANGEO.2024.103953

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing, 49*(4), 41–50. https://doi.org/10.1177/002224298504900403

Park, J., & Chowdhury, S. (2022). Investigating the needs of people with disabilities to ride public transport routes involving transfers. *Journal of Public Transportation, 24*, 100010.

Rejikumar, S. V. R., & Saha, R. (2019). An integrated framework for service quality, choice overload, customer involvement, and satisfaction: Evidence from India's non-life insurance sector. *Management Decision, 59*(4), 801–828. https://doi.org/10.1108/MD-12-2018-1354

Ardila, D. S. (2020). Global policies for moving cities: The role of think tanks in the proliferation of bus rapid transit systems in Latin America and worldwide. *Policy and Society, 39*(1), 70–90. https://doi.org/10.1080/14494035.2019.1699636

Tengecha, N. A., & Juma, M. (2021). The challenges and opportunities of Dar es Salaam city bus rapid transit on implementation and operations. *Developing Country Studies, 11*(7), 27–35. https://doi.org/10.7176/dcs/11-7-03

Tennakoon, V., Wiles, J., Peiris-John, R., Wickremasinghe, R., Kool, B., & Ameratunga, S. (2020). Transport equity in Sri Lanka: Experiences linked to disability and older age. *Journal of Transport & Health, 18*, 100913.

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Professional development opportunities as a driver to academic staff job satisfaction in selected public and private universities in Kenya

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ABSTRACT

This study was focused on distinguishing the operations in public and private universities and recommending possible policy intervention to improve the academic staff levels of job satisfaction and performance. Guided by the pragmatism research paradigm and the Herzberg two-factor theory, the study employed a concurrent mixed research method design. The target population for this study was the members of the academic staff in a selected private and public university. Participants were purposively identified and selected; therefore, the sample size for public university was 115 participants, while that of private university was 60. Data was collected through questionnaires and interviews, evaluated, and analyzed both qualitatively and quantitatively, giving an in-depth examination into the subject matter. The study found out that there is that lack of clarity, unequal access, and limited institutional support for training and research for members of the academic staff in public universities compared to private universities, which hindered staff academic growth. The study therefore concludes and recommends that universities should develop policies that mandate regular academic staff training, further allocate budget lines for academic staff professional advancement, and recognize academic staff developmental achievements in promotion criteria. For ethical consideration, the selected public university is referred to as University Alpha, while the private university is University Beta.

Keywords: Alpha, Beta, Development, Private, Professional, Public

I. INTRODUCTION

Professional development is a key driver that propels university academic staff self-satisfaction. The key roles of universities are to foster knowledge creation, innovation, training and inventions; this can only be achieved by investing in professional development of the academic staff members (Otieno, 2021: Altbach, 2015). Therefore, the objective was set out to examine how professional growth opportunities of the academic staff is a driver for job satisfaction. The independent variable in this study was professional development opportunities, which included but not limited to training, workshops, seminars, research grants and funding, study leaves, mentorship and coaching, conference and networking and capacity building programs. In this study, independent variable represents the availability, accessibility and quality of professional development initiatives. Dependent variables in this study was the academic staff job satisfaction whose indicators include satisfaction with teaching and research roles, motivation and morale, retention and turnover intention, perceived fairness in opportunities, commitment and engagement in the university, work life balance and overall career fulfillment. The dependent variable in this study reflects how academic staff feel about their jobs when professional development is available or not. Moderating variable in this study is the institutional type, which may influence the strength, and or direction of the relationship between professional development and academic staff levels of job satisfaction. Possible control or moderating variables include, gender, age, and academic staff rank, workload differences, university policies and funding capacity and governance and management practices.

All this are demographic and institutional factors. The core relationship between independent and dependent variable in this study is that professional development opportunities are expected to have positive relationship with academic staff job satisfaction. When universities provide structured and accessible professional development, academic staff will eventually feel valued, competent and supported in their career growth. This enhances the academic staff levels of job satisfaction making them more motivated, loyal and productive at work. This sentiments seem to find favour in a number of scholarly works by Korir (2017); Otieno, (2021), Tettey (2006) and Ulfah et al (2023). The type of institution whether public or private may determine how strong or weak policies are developed. In private universities, professional

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development may be more tailored, flexible and responsive leading to stronger satisfaction outcomes. In public universities, bureaucratic leadership styles, limited government funding may weaken the link between development opportunities and academic staff level of job satisfaction. Demographic factors for example the younger academic staff may value training and mentorship more while the senior professors may prioritize research grants and sabbaticals. Gender may also influence how staff perceive certain services in the universities affecting satisfaction levels. On the other hand, strong institutional policies supports staff levels of job satisfaction as opposed to weak or poorly implemented policies, which may reduce the rates of satisfaction; this also is in line with studies done by Korir (2017), Otieno (2021) and Altbach (2015). This study notes that professional development opportunities directly improves academic staff levels of confidence, career prospects and hence raises the levels of job satisfaction.

From the findings of this study on the influence of professional development opportunities on academic staff job satisfaction, it revealed a significant association between access to structured capacity building programs and the levels of job contentment among academic staff in both public (University Alpha) and private (University Beta) universities. However, marked disparities in opportunity, access, and institutional commitment were observed between the two categories of institutions. Quantitative data indicated that only 34% of academic staff in public universities (University Alpha) agreed that their institutions provided adequate professional development support, compared to 67% in private universities (University Beta). This difference was statistically significant ($p < 0.05$), underscoring a more wide practice of staff development in the private university (University Beta). Specifically, private university staff (University Beta) reported higher satisfaction with access to workshops, short courses, sponsored postgraduate studies, conference attendance, and internal mentorship programs. Qualitative data supported these historical trends. Interviews with public university staff (University Alpha) consistently revealed frustrations over the lack of structured, institutionalized professional development policies this reflects the sentiments pointed out by Korir (2017), Otieno, (2021) and Altbach (2015). Many participants indicated that opportunities were either unavailable, irregularly offered, or based on unclear criteria, often dependent on individual effort or donor funded projects. This perceived institutional neglect among the members of the academic staff created feelings of professional stagnation and diminished morale, particularly among younger academics who felt unsupported in their career advancement.

In comparison, private universities (University Beta) were seen to integrate professional development programs more systematically influencing the academic staff levels of job satisfaction. Participants described routine in-service training, workshops, research seminars, and funded postgraduate scholarships as key features of their universities in promoting academic staff welfare. Additionally, private universities (University Beta) often linked development opportunities to clear Key Performance Indicators (KPIs) and provided feedback avenues to academic staff members. In terms of academic mobility and exposure, the study found that public university (University Alpha) academic staff had access to a wider range of international conferences and research exchange programs, often supported by external grants or international collaborations. However, these opportunities were not equitably and favorably distributed, with most being available to senior faculty or those in STEM fields. Only 22% of junior academic staff in public universities (University Alpha) reported ever participating in an international professional development program, compared to 41% in private universities (University Beta)**.** Qualitative evidence suggested that while public universities (University Alpha) had partnerships with international partners, the benefits often failed to reach the a wider number of the academic staff due to poor communication, favoritism, and institutional challenges (Altbach, 2015).

Another critical dimension of professional development was mentorship and career progression support. In public universities (University Alpha), mentorship was largely informal and inconsistent, with several study participants indicating they had never received formal mentoring since employment. This lack of structured mentorship had a demoralizing effect, contributing to feelings of professional neglect. Consequently, 61% of private university (University Alpha) staff reported participating in formal mentorship programs, often with semester evaluations and clear job outcomes. The presence of career development officers, academic coaching, and regular performance appraisals created a supportive work environment that contributed to higher academic staff job satisfaction. The findings also pointed to university funding as a critical driver or barrier to professional development. Public university (University Alpha) staff repeatedly cited lack of budgetary allocation for staff training and conference participation as a limiting factor to academic staff levels of job satisfaction. Due to resource constraints, some universities either suspended training programs or made them highly competitive, this seems to agree with discussions by Korir (2017). On the other hand, private universities (University Beta), though smaller, had set aside annual budgets for professional development as part of their strategic priorities.

Moreover, the study explored how professional development affected research productivity and academic staff promotion. In public universities (University Alpha), academic staff who accessed training independently or through external funding often published more and progressed faster. However, lack of institutional support meant that many academic staff members remained stagnant or were promoted late, despite years of service. This was confirmed by quantitative data showing that 69% of public university (University Alpha) staff felt that their institution did not support them in meeting promotion requirements, compared to 46% in private universities (University Beta). By comparison, in

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private universities (University Beta), professional development was closely tied to institutional goals and staff appraisal systems, which enhanced research output, teaching innovation, and career progression.

This study while applying Herzberg's Two-Factor Theory, it notes that professional development opportunities for members of the university academic staff can be understood as a motivational driver that significantly enhances job satisfaction when present. In private universities (University Beta), where training, mentorship, and career planning were actively supported, these opportunities acted as strong intrinsic motivators, fostering commitment, innovation, and institutional loyalty. In public universities (University Alpha), the absence or irregular provision of these opportunities did not merely fail to motivate but actively discouraged staff, leading to disengagement and high turnover intentions.

1.1 Statement of the Problem

This paper is based on the premise that the academic staff form the intellectual base of higher institutions of learning both locally, regionally and globally, are entrusted with the creation, generation, dissemination, application, and preservation of knowledge and skills. However, available scholarly evidence on the subject of this study indicate that the levels of the university academic staff job satisfaction which is an essential driver of productivity, institutional commitment, research, and academic excellence is below expectations. In Kenya, both public and private universities have experienced rapid expansion, policy reforms, and intensified demands for quality assurance and standards, yet the institutional environments as a critical driver within which academic staff operate have not equally changed. Consequently, universities are struggling with rising dissatisfaction among members of the academic staff, reflected in diminished morale, declining performance, and increased attrition. Scholarly works by Ngema et al. (2022), Saifalislam et al. (2014) Omweri (2012) and many other have made a significant effort of pointing out the effect of professional development opportunities as a key driver to academic staff levels of job satisfaction. However, these studies have failed short of examining the issue in the context of public and private universities in Kenya whose findings can be generalized to other similar contexts. Similarly, limited research that exists related to the subject matter tends to generalize findings across universities, ignoring the unique governance structure, funding, and operational models that differentiate specifically private and public universities in Kenya. This analytical gap has left MOEST, CUE, policymakers, UMB, UASU, and university councils without wide, evidence-based frameworks for responding to university academic staff welfare concerns in an objective manner, justifying the urgency of this study and why it was conducted.

1.2 Research Objective

The study was guided by the following one key objective, to aanalyse the effect of professional development opportunities on academic staff job satisfaction in selected public (named University Alpha) and private (named university Beta) universities.

II. LITERATURE REVIEW

2.1 Theoretical Review

The idea of university academic staff levels of Job satisfaction is a complex issue, influenced, and determined by various key institutional drivers. These key drivers are determined by both local, regional and international forces of which, some are unique to a specific contexts and settings. In order to give an in-depth examination and detailed understanding of these drivers drawing comparison between the public and private universities. This study has used Herzberg's Two-Factor Theory developed by Frederick Herzberg in the 1950s (Herzberg, 1968). This theory has greatly contributed in providing a deeper and detailed understanding of the institutional drivers influencing university academic staff levels of job satisfaction in the context of university Alpha representing public universities and university Beta representing private universities. The theory allowed the study to capture both the structural and psychological dimensions of the university academic staff members in the two universities. Further, it not only strengthened the theoretical foundation of this study but also enabled a deeper reflection of specific investigation of how public and private universities in Kenya have created grounds that influence and affect academic staff job satisfaction levels.

2.1.1 Herzberg Two Factor Theory

Herzberg's Two-Factor Theory developed in 1959 (Herzberg et al, 1959; Herzberg, 1968).), was found to be suitable and adequate which is also referred to as the Motivation-Hygiene Theory. This theory is found to distinguishes between two sets of drivers that influence university academic staff levels of job satisfaction in both university Alpha and university Beta: that is the *motivators* which is considered as intrinsic motivational driver and *hygiene factors* which is considered as extrinsic drivers. According to Herzberg, motivator drivers consists of elements such as staff recognition, staff achievement, and staff responsibility which are considered to influence academic staff job satisfaction and drive or increase staff output, while on the other hand hygienic drivers consists elements such as university policies, university administrative practices, academic staff salary, and university working conditions which do not in themselves motivate members of the academic staff, but their absence or inadequacy definitely leads to high levels of job

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dissatisfaction among the members of the university academic staff in both university Alpha and university Beta for this study (Herzberg et al., 1959).

Based on this study, policies that promote professional development opportunities in both university Alpha and Beta influences largely the level of the university academic staff job satisfaction. When a university whether Beta or Alpha has poorly designed or inconsistently applied policies characterised with unclear academic staff promotion procedures and criteria, it may contribute to lower job satisfaction. On the other hand, when university policies are clearly and well-articulated, procedurally implemented, and transparently it will lead to greater academic staff job satisfaction levels in both university Alpha and university Beta (Ngema et al, 2022; Odhiambo, 2014). It should be understood that university policies such as professional or career progression policies are critical drivers in maintaining and promoting the academic staff levels of job satisfaction.

2.2 Empirical Review

Saifalislam et al. (2014) conducted a study on the Influence of training, recruitment and selection, and development on the organizational performance of the Jordanian Public University in Malaysia. The study revealed that training, recruitment and selection are the development influences on employee performance. Finally, the study recommended that there should be a training and management development program to enhance the capabilities of employees. For any organization to achieve its intended goals, there must be well-organized programs specifically for recruiting, selecting, training and developing workers (academic staff). However, the study focuses on a public university in Malaysia, while the current study will focus on universities, which provide a knowledge gap.

Ngema et al. (2022) studied employee development practices as a solution to the employee job satisfaction outcomes in the Ministry for Home Affairs in South Africa. The study found that employees need to be trained, recruited and placed in a way that will facilitate them to utilize their skills and abilities effectively). For academic staff to perform excellently, their managers must work out their professional development. However, the study was based on the Ministry of Home Affairs in South Africa, while the current study will be on Universities in Kenya. Nama et al. (2022) argues that trained employees were more likely to improve service delivery. Coaching and mentoring could be used to improve performance. The study recommends that the human resource department continuously revise and update its employee policy to ensure that training and development investment equips employees with the required skills and competencies.

Wanjara and Ogembo (2024) found that training is related to academic staffs' performance. Therefore, academic staff should be allowed to undergo different training to develop their professions. Omweri (2012) notes that when there is a high level of academic staff productivity, there is a strong positive relationship between the level of academic staff productivity and the level of career development of academic staffs. The study recommends that policies, plans and actions must always pass the test of not only filling classroom positions but filling them with academic staffs of the highest quality, prepared and able in their content area, their pedagogical approaches, and their commitment to improving student achievement.

III. METHODOLOGY

3.1 Study Design

This study employed a mixed-method research design, specifically concurrent mixed method design [QUANT + qual] (Kroll et al, 2005). Generally, a research design was used to determine what, when, how much, where, or by what means a study is conducted. The research design was suitable since qualitative data provided more insights and in-depth information from the information collected. Participants lived experiences played a significant role in drawing conclusions in this study.

3.2 Study Setting

This study was based in Uasin Gishu and Machakos Counties of Kenya. The two counties represent diverse geographical and demographic characteristics needed for this study. Uasin Gishu County, is known for its vast agricultural activities and many educational institutions which includes, several universities namely; Mount Kenya University Eldoret Campus, Moi University, Catholic University of East Africa Gaba Campus, University of East Africa Baraton Eldoret extension Center, and the University of Eldoret, equally Machakos County is inhabited by diverse ethnic communities and has several educational institutions including Machakos University, South Eastern Kenya University Tala Campus, Scott Christian University and Daystar University. Consequently, the variance in these areas provided valuable insights into how different work environmental factors influence the academic staff job satisfaction in the university.

3.3 Target Population

Target population for this study was 887 as tabulated in table 1

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Table 1

Target and Actual Study Population

University Category	Target Population	Accessible Population
University Alpha (Public University)	740	134
University Beta (Private University)	141	66
Total	**887**	**200**

3.4 Sampling Procedure and Sampling Size

Simple Random Sampling was employed in this study. This method was designed to ensure that every participant within the target population had an equal chance of being selected, which helped in eliminating bias and ensuring that the sample was a clear representative of the population. In this case the the population included all academic staff across the selected public and private universities in Kenya. Therefore, the sample size for the university Alpha was 115 participants, while the sample size for university Beta was 60 participants.

3.5 Data Collection Instruments

The study used questionnaires and well developed interview schedules as the main data collection instrument for academic staff and university managers. The two data collection instruments corroborated each other to ensure an in depth data collection on the subject.

3.6 Data Analysis

Data was analyzed qualitatively and quantitatively. This was done concurrently and then merged with the final report. Quantitative data was analyzed using Statistical Package for Social Science (SPSS) software. Both descriptive and inferential statistics were used in quantitative data analysis. For descriptive statistics, percentages and frequencies were used; for inferential statistics, simple linear regression was used.

IV. FINDINGS & DISCUSSION

4.1 Factor Analysis: Identifying Core Dimensions of Professional Development

Factor analysis was used to understand how professional development contributes to academic staff satisfaction. Exploratory factor analysis was conducted on the data collected via survey, participants in this study rated a series of Likert scale items relating to the availability and quality of professional developments programs, including opportunities for further education, participation in conferences and workshops, mentoring, access to grants and institutional support for training. The results from exploratory factor analysis came out with three major findings that collectively explained seventy two point four percent of the total variance in responses as follows:-

Factor 1: Institutional Support for Career Advancement. This factor included items related to institutional support for further or advanced studies, internal promotion pathways, and access to mentorship and leadership programs. This factor had a high eigenvalue of three point one four and strong factor loadings across all related items (≥ 0.71). This outcome conforms well with a study that was conducted by Saifalislam et al. (2014) on the Influence of training, recruitment and selection, and development on the organizational performance of the Jordanian Public University where it study revealed that training, recruitment and selection are the development influences on employee performance. This was found to be a strong factor that influenced the academic staff levels of job satisfaction in university Beta compared to university Alpha.

Factor 2: Participation in Academic Conferences and Workshops. The second factor included support given to the members of the academic staff to attend local and international conferences and seminars, travel allowance, and incentives for paper presentations. This particular factor accounted for twenty five percent of the explained variance and was especially prominent in university Beta. According to Nama et al. (2022), he argues that trained employees were more likely to improve service delivery and at the same time be more motivated at the place of work. Coaching and mentoring could be used to improve performance. This study reveals that the human resource departments in both university Alpha and University Beta should continuously revise and update its academic staff employee policy to ensure that training and development investment equips employees with the required skills and competencies. This will play a significant role in raising their levels of staff motivation.

Factor 3: Access to Research and Training Resources. The third factor focused on access to online journals, institutional funding for research, training in emerging pedagogical technologies, and involvement in interdisciplinary projects. It had an eigenvalue of 1.67 and was more influential among younger members of the academic staff. According to a study done by Wanjara and Ogembo (2024) it was discovered that training is related to academic staffs' level of job performance. Therefore, according to the study, academic staff should be allowed to undergo different training to develop their professions. Omweri (2012) on the other hand notes that when there is a high level of academic

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staff productivity, there is a strong positive relationship between the level of staff productivity and the level of career development of academic staffs.

The findings clearly demonstrates how strongly each of the identified factor contributes to the professional development of the academic staff in both university Alpha and Beta. The results from factor analysis indicate that institutional career progression contributes to the largest percentage of the explained variance at thirty-four percent. This finding indicates that it is a major driver in the academic staff job satisfaction. The strength of this factor is based on the importance the staff have attached to promotion systems, mentorship programs and institutional support for further studies. The study further notes that when the support is strong these factors become great drivers of academic staff motivation. Academic staff participation in international conferences, seminars and workshops explains a significant portion of twenty five percent of the variance. This study therefore confirms that academic exposure, networking and intellectual exchange are critical institutional drivers to academic staff job satisfaction.

Close examination on the outcome of the findings indicates that faculty members view institutional support for example engagement as a critical driver to academic staff job satisfaction. It's clear that access to research and training services and resources a count to a smaller share of thirteen point two percent. The study discovered that this factor plays a significant role especially among the tutorial fellows. The study notes that the weight of this factor indicates that teaching technologies and cross disciplinary collaboration opportunities are growing in importance, especially in relation to adoption of online teaching in the universities. The comparative satisfaction score for the three of each of the professional development drivers in both university Alpha and Beta which deepens the understanding of institutional differences and their implication on staff job satisfaction levels. The study notes that in university Alpha the average satisfaction score stands at four point one indicating a high level of job satisfaction with the availability of clear promotion pathways, leadership trainings and support for further education among the members of the academic staff. In University Alpha the study indicates that the average score is 2.8, suggesting considerable job dissatisfaction among the academic staff. The study points out that the gap of 1.3 points is a clear reflection that the institutional policies on career advancement are significant drivers to the academic staff job satisfaction that public universities need to observe.

The study concludes that university Beta offers more structured and transparent career development mechanisms, including mentorship, leadership training, and further education support. Participation in Academic Conferences and Workshops. Indicating the highest average score of 4.3, this driver is observed in this study to be the most significant in university Beta. On the other hand the study points out that university Alpha scored 2.4, as a result of delayed disbursements, limited funding, and minimal institutional incentives. The 1.9-point gap in the two institutions suggests differences in institutional prioritization of academic exchange, contributing to dissatisfaction and missed career of professional developmental opportunities among the members of the academic staff. The resultant outcome of this study is that there is differences in availability of funds, policy support, and prioritization of academic staff scholarly engagement in university Alpha and university Beta.

On the factor on access to research, training and resources University Beta indicated an average score of 3.9 showing a positive perception among the members of the academic staff. On the other hand in university Alpha it recorded a low score of 2.1, showing job dissatisfaction among the academic staff. The two institutions show a 1.8-point difference reflecting underinvestment in academic tools and research capacity building, especially in university Alpha. It's therefore clear from the findings of this study that limited access to digital institutional infrastructure, modern pedagogy training, and collaborative projects reduces the levels of job satisfaction among academic staff members in university Alpha.

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Table 2

Summary of Factor Analysis Results on Professional Development Dimensions

Factor	Description	Key Items / Indicators	Eigenvalue	Variance Explained (%)	Supporting Literature	Interpretation / Implication
Factor 1: Institutional Support for Career Advancement	Captures institutional mechanisms that promote academic staff growth and advancement.	Support for further studies, promotion pathways, mentorship and leadership programs.	3.14	34.0	Saifalislam et al. (2014)	Strongest factor influencing job satisfaction. Institutional support and promotion systems significantly enhance motivation among staff, particularly in University Beta.
Factor 2: Participation in Academic Conferences and Workshops	Reflects opportunities for scholarly exposure, networking, and professional recognition.	Funding and facilitation for conferences, seminars, travel allowances, and incentives for presentations.	—	25.0	Nama et al. (2022)	A major determinant of staff motivation and performance. Continuous professional development through training and conferences enhances academic engagement.
Factor 3: Access to Research and Training Resources	Involves accessibility of learning materials, institutional funding, and exposure to modern pedagogical tools.	Access to journals, research grants, training in technology, interdisciplinary collaboration.	1.67	13.2	Wanjara & Ogembo (2024); Omweri (2012)	Least influential but significant among younger and junior academic staff. Limited access to research infrastructure reduces productivity and satisfaction.

Table 3

Comparative Satisfaction Scores (University Alpha vs. University Beta)

Factor	University Alpha (Mean Score)	University Beta (Mean Score)	Gap (β – α)	Interpretation
Institutional Support for Career Advancement	2.8	4.1	1.3	Beta provides stronger support for advancement and mentoring, resulting in higher satisfaction.
Participation in Conferences & Workshops	2.4	4.3	1.9	Institutional prioritization of academic exchange and training is higher in Beta.
Access to Research & Training Resources	2.1	3.9	1.8	Underinvestment in academic tools and research facilities in Alpha reduces job satisfaction.

4.2 Qualitative Analysis

The study conducted focused group discussions among the members of university Alpha and university Beta to explore their personal views and experiences, opinions, perceptions on the contributions of institutional professional development on the academic staff job satisfaction. The results were analyzed using narrative analysis.

In university Beta the participants noted on the culture of institutional investment on the academic staff that:-

> "*We have several opportunities to grow, the university though private has elaborate structures such as organizing regular workshops, funding research and seminars. This kind of support makes us as the workers of the university feel appreciated and valued at all times*". KII-14-F-B
>
> '*The staff both teaching and non-teaching is encouraged to grow in this institution, if you want to study a PhD or any program the university will always assist you to plan for it'* KII-11-M-B

The study reveals that there was a strong mentorship programs for the tutorial fellows in the university where they were linked and paired with the older members of the academic staff to assist them improve on their research skills. One participant noted

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'When I joined the university I didn't know much about the academy, my chair of department linked me with the one of the eldest members of the department who inducted me to the practices of the university. I was taken through the process of research and grant proposal writing. My morale was lifted'. KII-13-F-B

This discussions clearly indicate on the driving role of professional and career development as an institutional force in promoting academic staff job satisfaction in university Beta. On the other hand participants from university Alpha gave a contradicting outcome emphasizing on demotivating factors such as luck of mentorship, luck of staff in service programs, nepotism, tribalism and institutional autocracy for example:-

'*The university will only sponsor those in management and administrative positions to attend conferences. The rest of us if you want to attend a conference you have to sponsor yourself'.* KII-12-M-A

The university has a lot of opportunities for the members of the academic staff, unless you know someone you will never benefit from it. They will only consider those whom are in favor with them'. KII-14-F-A

'*In this waters in most cases you will feel that you are on your own. Its either you support yourself to grow or you perish'.* KII-10-F-A

From the voices of the participants in this study, it is evident that there are great disparities between university Alpha and university Beta ion the issue of creating opportunities to academic staff members in both university Alpha and university Beta as well as available institutional professional opportunities and career progression support to the members of the academic staff in those institution.

The findings point out that university Alpha has over time neglected the welfare of the staff members especially on the issue of promotions and career progression compared to university Beta. There are no clear promotion policy framework and instead the universities have taken the advantage of the lapse in clear policy framework for not promoting the members of the academic staff. This move has had a detrimental effect to the general welfare and the moral of the staff. On the other hand in university Beta which is a representative of private universities in Kenya, the university has clear promotion policy framework that support the members of the academic staff, this in turn has positively raised the levels of the academic staff job satisfaction.

This study would like to point out that despite this difference we have shared perspective among the members of the academic staff in the two universities. Staff in the two universities stressed on the need of the institutions to effectively recognize their professional growth efforts such as publishing, attending conferences, earning additional academic certification and winning grants for the university. Participants from university Alpha and university Beta linked professional development opportunities with increased morale, better performance and stronger institutional policy.

4.3 Policy Implications

This objective has a number of policy implication to UASU, university councils, university management boards and other stakeholders. Findings of this objective proposes that university Alpha should developed and implement mentorship programs for its academic staff, they should further allocate enough funds to promote academic staff career progression programs, institutional recognitions mechanism and balance staff workload. University Beta should develop a specific policy that minimizes on strain on the academic staff members especially in achieving institutional policies.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

The findings of this objective has demonstrated that professional development opportunities are critical drivers to academic staff job satisfaction. The study concludes that, where the academic staff members are given support they tend to be contended with their work environment, which increases their output at the university. Through the integration of factor analysis, chi square and qualitative methods, the study provides a clear and better understanding of this objective. The findings reinforces the need for universities to invest in the members of the academic staff in order to boost staff morale and achieve institutional goals. The study therefore notes that university academic staff job satisfaction is dependant to professional development opportunities provided by the universities.

5.2 Recommendations

This study would like to recommend that universities should establish clear, equitable, and funded professional development pathways. Universities must create structured, transparent, and well-funded professional development programs aligned with academic career progression. The findings demonstrated that lack of clarity, unequal access, and limited institutional support for training and research hindered academic growth, especially in public universities (University Alpha). Policies should mandate regular training, allocate budget lines for professional advancement, and recognize development achievements in promotion criteria.

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REFERENCES

Altbach, P. G. (2015). Academic freedom: International realities and challenges. *Higher Education, 70*(1), 59–67. https://doi.org/10.1007/s10734-014-9823-6

Deci, E. L., & Ryan, R. M. (2008). Facilitating optimal motivation and psychological well-being across life's domains. *Canadian Psychology, 49*(1), 14–23. https://doi.org/10.1037/0708-5591.49.1.14

Herzberg, F. (1968). One more time: How do you motivate employees? *Harvard Business Review, 46*(1), 53–62.

Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work* (2nd ed.). John Wiley & Sons.

Korir, B. C. (2017). Influence of working conditions on teachers' job satisfaction in public secondary schools in Kenya. *International Journal of Advanced Research in Education & Technology, 4*(2), 22–27.

Kroll, T., Neri, M. T., & Miller, K. (2005). Using mixed methods in disability and rehabilitation research. *Rehabilitation Nursing, 30*(3), 106–113. https://doi.org/10.1002/j.2048-7940.2005.tb00373.x

Nama, K., Daweti, B., Lourens, M., & Chikukwa, T. (2022). The impact of training and development on employee performance and service delivery at a local municipality in South Africa. *Problems and Perspectives in Management, 20*(4), 42–51. https://doi.org/10.21511/ppm.20(4).2022.04

Ngema, K., Rajlal, A., & Utete, R. (2022). Employee training as a panacea for career development: Evidence from South African Police Service. *Acta Universitatis Danubius, 18*(6), 174–195. https://ssrn.com/abstract=4569049.

Odhiambo, G. (2014). Higher education in Kenya: An assessment of current responses to the imperative of widening access. *Higher Education Quarterly, 68*(4), 394–404.

Omweri, O. H. (2012). *Career development and teacher productivity in selected secondary schools in Rongo Division, Kenya* (Unpublished master's thesis). Kampala International University.

Otieno, W. (2021). Staffing dynamics in Kenyan universities: Challenges and policy directions. *African Journal of Higher Education Studies, 9*(2), 114–130. https://doi.org/10.1234/ajhes.v9i2.2021.

Saifalislam, K. M., Osman, A., & AlQudah, M. K. (2014). Human resource management practices: Influence of recruitment and selection, and training and development on the organizational performance of the Jordanian public university. *IOSR Journal of Business and Management, 16*(5), 43–46. https://doi.org/10.9790/487X-16514346

Tettey, W. J. (2006). *Staff retention in African universities: Elements of a sustainable strategy*. World Bank. https://doi.org/10.1596/36697

Ulfah, M., Sugiyanto, F. X., & Rizky, D. A. (2023). The impact of organizational citizenship behavior and transformational leadership on teacher productivity. *International Journal of Educational Management, 37*(4), 615–631.

Wanjara, A. O., & Ogembo, P. O. (2024). Impact of e-leadership on service delivery in Kenya: A case of public universities. *ETDC: Indonesian Journal of Research and Educational Review, 3*(2), 1–12. https://doi.org/10.51574/ijrer.v3i2.1139

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Health information use for improving health behaviour among secondary school students in East Africa: A Systematic review

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ABSTRACT

This systematic review assesses the use of health information to improve health behaviour among secondary school students in five East African countries: Burundi, Kenya, Rwanda, Tanzania, and Uganda. Using the PRISMA methodology, 50 peer-reviewed articles published between 2000 and 2024 were analysed from a total of 1,873 articles. Most studies (67.34%) were published between 2020 and 2024, with the majority coming from Tanzania (38.77%). Health information sources, such as parents, teachers, and online platforms, are considered credible, with parents and teachers being the most credible. However, inconsistencies, cultural stigmas, and inadequate resources hinder access to these services. Health information has influenced students health-seeking behaviours, with some studies noting improved practices like safe sex and reduced risky behaviour. Educational strategies, in most cases, do not prioritise boys' specific health needs. The review highlights the importance of designing interventions that consider demographic disparities and recommends further research into these influencing factors.

Keywords: East Africa, Health Behaviour, Health Information, Information Access, Secondary School Students

I. INTRODUCTION

Secondary school students are central to their development, where adopting healthy behaviours significantly affects their lifelong wellbeing (World Health Organization [WHO], 2019). Access to accurate health information is vital in shaping their understanding of health issues and influencing their health behaviours (Tengia-Kessy et al., 2016). It is vital to explore the sources, alleged usefulness, and challenges of accessing health information among secondary students to tailor effective health education interventions (WHO, 2019). The health and well-being of secondary school students represent critical social practices for future health decision-making and behaviours. Health education equips adolescents with the knowledge and skills necessary for making knowledgeable health choices, particularly regarding sexual and reproductive health (Ito et al., 2022).

The accessibility of health information is determined by the available sources of information, for students need reliable sources that will provide them with accurate information for their wellbeing; previous studies have shown that students access health information from various sources, including teachers, parents, peers, online platforms, and school health services(Ayubu & Kabeya, 2019; Mureithi et al., 2021). However, the credibility and reliability of these sources require additional investigation to ensure they provide accurate and comprehensive health information (Mutea et al., 2020; Handebo et al., 2021; Boateng et al., 2022; Kalu et al., 2022).

The ideal scenario for secondary school students in East Africa would be easy access to credible, relevant, and effective health information they perceive as applicable (Mavura et al., 2022). This would enable them to make informed decisions about their health, adopt healthier behaviours, and engage with health information in a way that improves their overall wellbeing. With access to consistent and reliable health information, students would be empowered to seek the resources they need and apply them effectively (Chesire et al., 2024).

Despite the availability of health information to secondary school students across East Africa, primarily in Burundi, Kenya, Rwanda, Tanzania, and Uganda, significant challenges persist in accessing, understanding, and utilising this information. Numerous studies (Municipality & Asiimwe, 2023; Mutea et al., 2020; León-himmelstine et al., 2021; Bishoge et al., 2022; Langat et al., 2024) have documented persistent barriers, especially in rural areas. These studies also provide evidence that, despite availability, many students fail to engage with or act on the information due to negative perceptions about its relevance and usefulness.

As a result, students' health-seeking behaviours are often ineffective, and they may not be informed about health information to improve their decision-making or behaviour (Rehnström Loi et al., 2019). The failure to

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address students' perception of the usefulness of the information, coupled with the barriers to accessing it, leads to a gap in health knowledge and poor health outcomes. Mbarushimana et al. (2022). This lack of effective engagement with health information hinders the promotion of healthier behaviours and perpetuates adverse health outcomes among students (Panchaud et al., 2019). This systematic review examines existing research on the influence of health information use on improving health behaviours among secondary school students in East Africa.

1.1 Research Questions

i. What is the current state of availability of health information among secondary school students, as reported in existing literature?
ii. What evidence is available regarding the credibility and effectiveness of health information sources used by secondary school students?
iii. According to previous studies, what is the perceived usefulness of health information among secondary school students?
iv. What barriers to accessing health information have been identified in the literature among secondary school students?

II.METHODOLOGY

This systematic review represents a comprehensive effort to investigate the use of health information to improve health behaviours among secondary school students in East African countries, specifically Burundi, Kenya, Rwanda, Tanzania, and Uganda. The study followed a formal, predefined methodology distinct from more conventional literature reviews, enhancing transparency and reproducibility (Pearce & Ford, 2015).

The systematic review adhered to the PRISMA protocol and applied clear eligibility and exclusion criteria to ensure rigour in the review process. This systematic review provides a robust and reliable synthesis of the available evidence (Moher et al., 2009). The selection process was rigorous, transparent, and reproducible, as outlined in Figure 1.

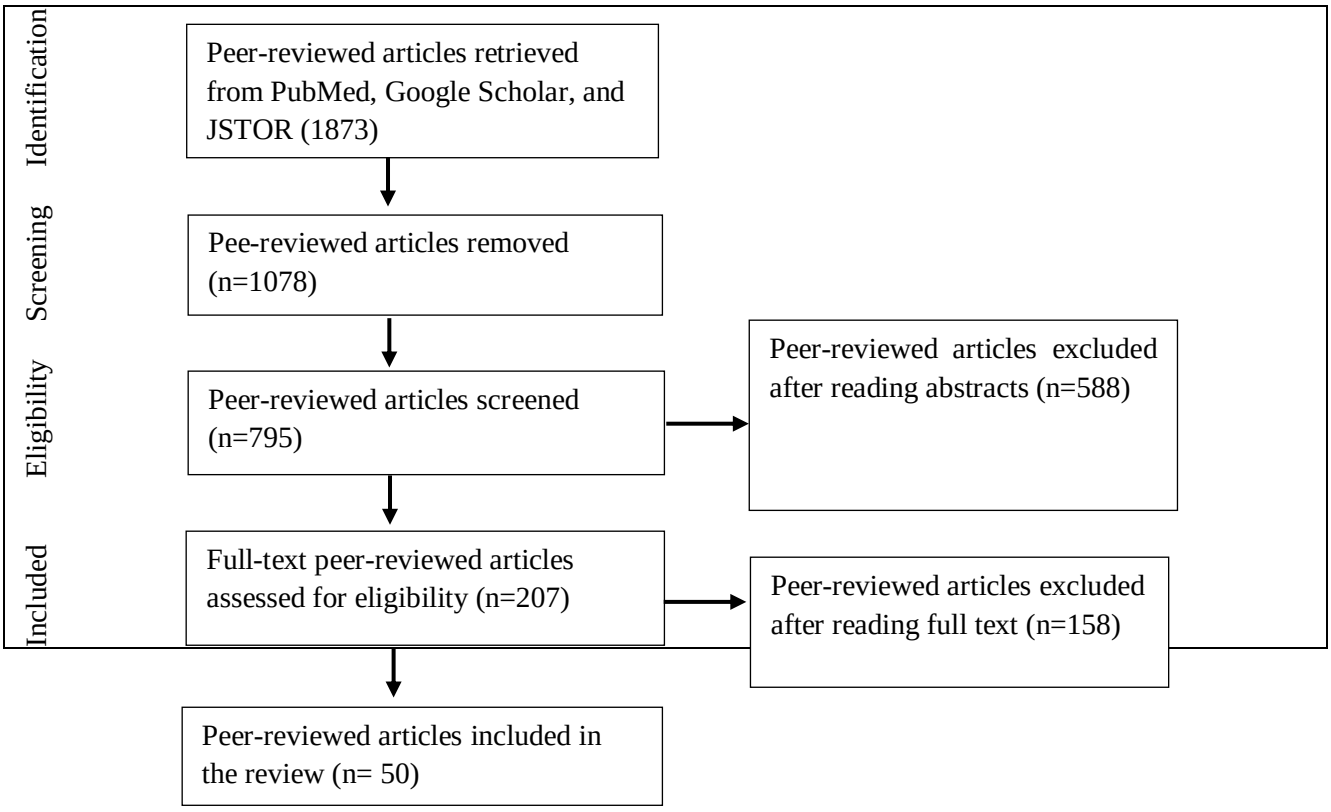

Figure 1
The Flow Chart of the Selection Process of Articles for Systematic Review

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2.1 Eligibility Criteria

The study focused exclusively on peer-reviewed journal articles accessed through PubMed, Google Scholar, and JSTOR that use health information to improve health behaviours among secondary school Students in East Africa. The period for inclusion was set between January 1, 2000, and December 31, 2024. The eligibility and exclusion criteria were carefully developed and consistently applied throughout the review.

2.2 Search Strategy, Inclusion and Exclusion Criteria

Search Strategy: A search strategy was developed to identify relevant studies addressing the use of health information and its influence on health behaviours among secondary school students in East Africa. The search involved a combination of keywords, including "health information", "health behaviour", "East Africa and student health", and "secondary school* student* health education". Using truncations and Boolean operators helped broaden the search while maintaining relevance. This strategy enabled the retrieval of a large pool of studies discussing key aspects, including the availability, credibility, usefulness, and accessibility of health information.

Inclusion Criteria: The review included peer-reviewed journal articles that met specific conditions. First, the articles had to be published in English and focus on the selected countries of East Africa: Tanzania, Kenya, Uganda, Rwanda, and Burundi. Second, the selected studies were required to address the health information experiences of secondary school students, particularly in terms of availability, credibility, perceived usefulness, and accessibility. Articles that presented empirical data or offered literature-based insights on how students interact with health information to influence their behaviours were prioritized.

Exclusion Criteria: Studies were excluded if they did not focus directly on secondary school students or their use of health information. Articles published in languages other than English were also excluded, as were studies from countries outside the targeted East African countries. Specifically, research from the Democratic Republic of Congo, Somalia, and South Sudan was excluded due to political instability in these countries, which has contributed to limited access to health information among students.

The search initially identified 1,873 articles. After an initial screening, 207 articles met the eligibility criteria for full-text review. Upon closer examination, 158 studies were excluded based on the predefined inclusion and exclusion criteria. Consequently, the final review included 50 peer-reviewed journal articles suitable for this study.

2.3 Data Extraction Method

Data were extracted using a paper form with five columns; the first column included the author's name and the year of publication. The second column has the title of the articles. The third column has key findings, the fourth column has a geographical location where the articles were published, and the fifth column has the methodology used(Schmidt et al., 2021)(See Tables 1,2,3, 4)

III. FINDINGS & DISCUSSION

3.1 Time Distribution

The findings indicate a steady increase in the number of publications over time, suggesting a growing scholarly interest in the role of health information in influencing health behaviours among secondary school students in East Africa. This growing interest reflects a broader recognition of the critical need to address challenges in adolescent health and access to information. Specifically, Figure 2 shows that 33(66%) of the studies were published between 2020 and 2024. This was followed by 9 (18%) studies published between 2015 and 2019, 5 (10%) between 2010 and 2014, and 3 (6%) between 2005 and 2009.

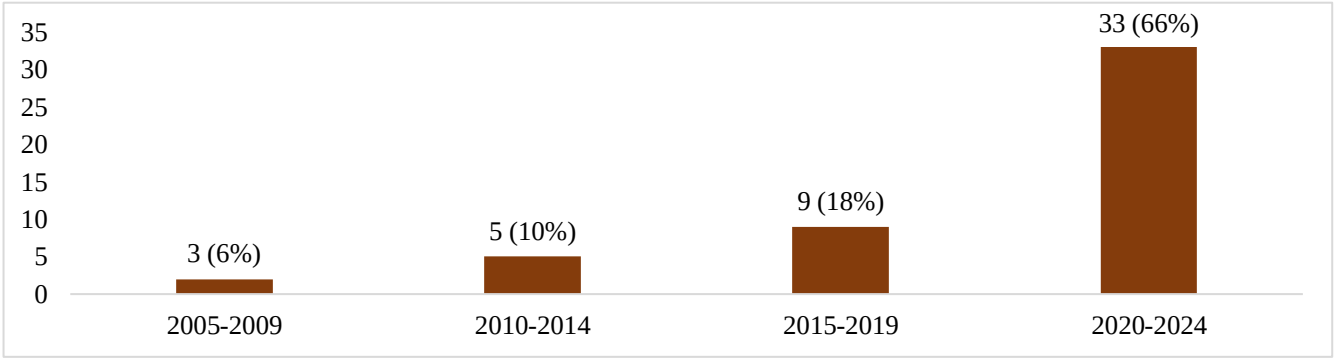

Figure 2
Timeline Distribution of Reviewed Publications

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3.2 Geographical Location

The study found that 19 (38%) of the studies on health Information Use for improving health behaviours among secondary school Students in East Africa were conducted in Tanzania (Figure 3). Followed by 15(30%) conducted in Kenya, 11(22%) conducted in Uganda, 3(6%) in Rwanda and 2(4%) in Burundi. This reveals a significant gap between the rates of research on health information access and use in East African countries, which can be used to improve health behaviour. Based on the available studies, this poses a challenge when creating regional health information use and access policies among member states. However, few studies reflecting Burundi and Rwanda could be associated with excluding publication in other languages, such as French, a key language in the two countries.

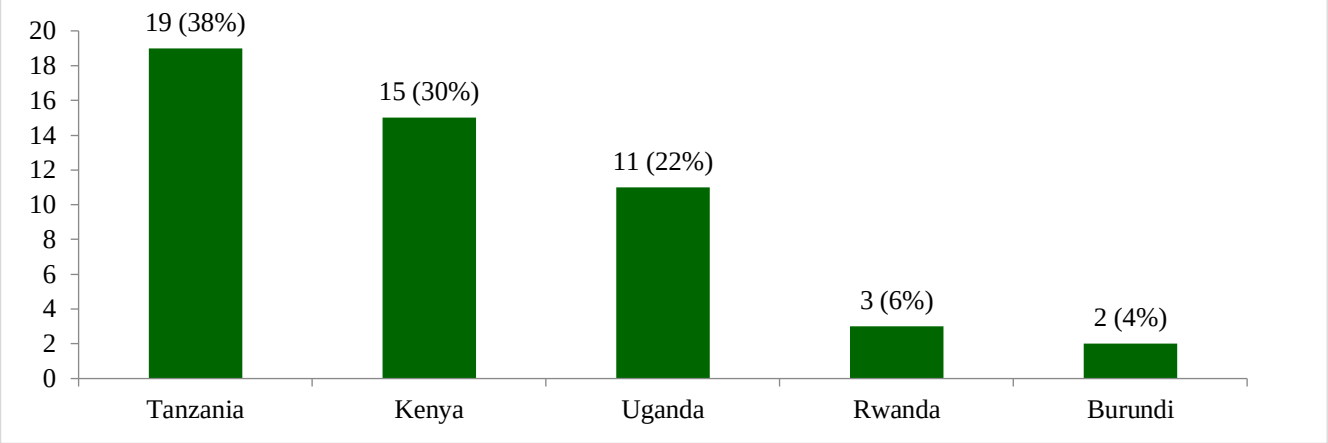

Figure 3
Geographical Distribution of the Reviewed Publication

3.3 Availability of Health Information

The availability of health information to secondary school students in East Africa has been widely reported in existing literature. However, it varies significantly across different contexts and populations (Table 1 in detailed annex).

Table 1
Available Health Information in East Africa

SN	Key Findings on the available information	Authors
1.	General health information related to reproductive health	Adan et al. (2018), Chadwick et al. (2022), Oware et al. (2023), Inwani et al. (2021)
2.	Sexual and reproductive health information	Kamangu & Mbago (2024). Mitchelle et al. (2014), Ndayishimiye et al. (2022), Langat et al. (2024), Dickson (2023), Kemigisha et al., (2019), Ngissa et al.,(2024)
3.	Health information on family planning	Ayubu & Kabeya (2019)
4.	Health information on contraceptive usage	Mkumbo et al. (2009)
5.	Health information on HIV/STIs, condom use, benefits of abstinence, and contraception	Ogolla and Ondia (2019)

Numerous studies highlight that sexual and reproductive health information is the most commonly available type. For instance, Oware et al. (2023) report that sexual health information is accessible to many students across East Africa. Similarly, Adan et al. (2018) document the availability of reproductive health information, indicating that such topics dominate the landscape of adolescent health education. Mitchell et al. (2014). Ayubu and Kabeya (2019), Kamangu & Mbago (2024) further confirm the widespread availability of sexual and reproductive health information in various parts of East Africa. These findings collectively suggest that this domain remains the primary focus of health information accessible to adolescents.

However, despite this general availability, the reach and distribution of health information are not uniform across East Africa. Ito et al. (2022) demonstrate that interactive programs can enhance the presence of health information; however, their implementation is uneven. Bishoge et al. (2022) observe that although students are involved in health-related activities, the actual presence and delivery of structured health programs remain limited

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in some settings. Kavana (2021) ascertains this gap in Tanzania, noting the absence of structured sexual health education in the curriculum, which limits the consistent availability of accurate information. Philipo and Ntawigaya (2025) provide additional insights, showing that significant gaps in health information availability persist in many rural secondary schools in East Africa. Their findings highlight a reliance on untrained staff and a lack of basic resources, which restrict students' access to even the most essential health information, including mental health. These studies demonstrate that while health information, especially on sexual and reproductive health, is generally available to secondary school students in East Africa, its distribution and accessibility are inconsistent. Locality, infrastructure, and institutional support continue to shape students' ability to access the health information they need reliably.

3.4 Credibility and Effectiveness of Health Information Sources

Credible health information sources play a key role in shaping health behaviours among secondary school students in East Africa. Studies show that the effectiveness of health information is closely linked to the trust students place in those delivering it (Table 2 in the detailed annex).

Table 2

Credibility and Effectiveness of Health Information Sources in East Africa

SN	Key Findings on Health Information Sources	Authors
1	The primary health information sources mainly used are teachers	Ayubu et al. (2019), Kemigisha et al. (2019), Muganyizi (2012), Ngilangwa et al. (2016), Ngissa et al.(2024) Muhwezi et al. (2015), Ito et al. (2022), Ogolla and Ondia (2019).
2	Health information is effectively communicated through media (radio and television)	Adan et al. (2018)
3	Community-based sources and health facilities have a significant influence on the dissemination of health information.	Langat et al. (2024), Ndayishimiye et al. (2020), Kemigisha et al. (2019)
4	Health information is derived from credible sources such as pharmacies and databases.	Holst et al. (2023), Lyimo (2024)
5	Personal networks and mass media play a significant role in facilitating access to health information.	Adan et al. (2018). Mureithi et al. (2021), Inwani et al. (2021)

Teachers, parents, and community members are consistently identified as credible sources. Kemigisha et al., (2019) reported that these sources provide accurate and relatable health messages through the school curriculum. Their interventions led to positive changes in students' health knowledge and behaviours.

Students used various sources, including parents, teachers, adults, computers, and the Internet. Most students preferred teachers and parents over other sources. Students who relied solely on these groups formed the largest single-source users, emphasizing the effectiveness of parents in delivering credible health messages. Their study found that parents significantly influenced students' adoption of positive health behaviours. Muhwezi et al. (2015) reported that teachers were the primary source of reproductive health information, noting that many teachers lacked proper training, which led to inconsistent information delivery. This was also highly contributed to by the poor skills of many teachers.

Tengia-Kessy et al. (2016) supported the role of teachers but also observed that students still lacked knowledge of specific health topics, despite having access to health information from readily available teachers. Ayubu and Kabeya (2019) confirmed that teachers are trusted. However, students sometimes fail to grasp what is taught, lack skills to listen and acquire information, and the limited time teachers spend supporting their students in health matters remains a significant problem. Mbarushimana et al. (2022) investigated the diversity of sources related to sexual and reproductive health in Rwanda. While teachers were key health informants, they noted the limited scope and effectiveness of sexuality education programs in Rwandan secondary schools. Chesire et al. (2024) implemented an intervention that encouraged students to think critically about health choices. Their results stressed the importance of teacher training in making health education impactful; the less the training, the less the skills and the less the positive impact of health education. Embleton et al. (2023) also reported that pharmacies and drug stores were significant sources of contraceptive information. However, they found that knowledge did not always translate into actual contraceptive use. This provides a clear indication that the accumulation of knowledge does not guarantee its practical application.

Ogolla and Ondia (2019) also confirmed that teachers are a primary source of health information for students, providing more health information than other available sources, such as health experts. Håkansson et al. (2024)revealed that students preferred school-based teaching, online tools, social media, and trusted community

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members. These were seen as more engaging and relevant to their needs, as they provide features that support visualisation, interaction, and access to more comprehensive information from various parts of the world. Holst et al. (2023) presented a different view. They argued that community health databases could offer credible and reliable information, especially if integrated into student learning systems. This case has been proven in rural parts of Tanzania through the usage of community health info spots in providing health information in Migoli and Izazi.

Seidu et al. (2022) highlighted the role of radio and television. These mass media platforms effectively disseminate health messages to young people in Kenya on various health topics crucial to youth, such as reproductive health information. Inwani et al. (2021) found mobile phone applications to be valuable tools for their purposes. They offered private and accessible information on sexual and reproductive health. Adan et al. (2018) reported that peers and the media were the most preferred sources of health information for many students.

These findings from reviewed studies provide strong evidence that the credibility of health information sources directly affects how secondary school students in East Africa respond to health messages. Trusted sources, such as teachers, parents, and community members, are often cited as effective channels for delivering health education. However, teacher training gaps, curriculum implementation inconsistencies, and the limited interactive or student-centred approach weaken their effectiveness. Similarly, while digital tools such as mobile apps and social media are gaining popularity, disparities in access and digital literacy limit their reach among rural or underserved populations.

3.5 Perceived Usefulness of Health Information

The perceived usefulness of health information is crucial in determining whether students actively apply the information they receive to their lives (Table 3 in the detailed annex).

Table 3

Perceived Usefulness of Health Information

SN	Key Findings on Usefulness of Health Information	Authors
1	Information contributes to improved critical thinking about health and healthier lifestyles, including aspects such as sexual health.	Chesire et al. (2024)
2	Health information reduces sexual risk behaviours and promotes safer sexual practices.	Ogolla and Ondia (2019), Singh et al. (2021), Mkumbo et al. (2009)
3	Awareness and understanding of sexual and reproductive health information positively influence safe sexual behaviours.	Mwageni (2006), Mitchelle et al. (2014), Apondi et al. (2021), Mwanga et al. (2008)
4	Access to reproductive health information helps prevent early pregnancies and promotes adherence to health services.	Mwangosi et al. (2002), Apondi et al. (2021), Mureithi et al. (2021)
5	Practical application of sexual and reproductive health information leads to behaviour change.	Ngissa et al. (2024). Lyimo et al. (2024), Nkata et al. (2019)

Perceived usefulness is a pivotal factor influencing whether students apply the health information they receive. Although students may receive adequate health education, their ability to internalize and utilize this information effectively varies. For instance, findings from Apondi et al. (2021) indicated that with general awareness about HIV/AIDS, many students engaged in seeking health information on preventive and transmission measures. In contrast, a study by Bishoge et al. (2022) demonstrated students' knowledge of health issues in relation to active environmental health behaviour. The findings from Lyimo et al. (2024) reflected a similar sentiment, indicating that increased awareness of health issues led to healthier choices when students perceived the information as relevant and valuable. A similar perspective was taken by Singh et al. (2021)and Chesire et al. (2024) on the perceived usefulness of health information, whereby the health information received was valuable for students in improving their sexual behaviour. The same perspective was reported on students' awareness of sexual and reproductive health information matters, which was good and positively affected their understanding of safe sexual behaviours (Mwageni, 2006; Mkumbo et al., 2009). Ninsiima et al. (2020) also reported that the implementation of sex education significantly improved the knowledge and health behaviours of young people, particularly in the province of Gitega in Burundi.

When it comes to health information which is helpful in the population, setbacks exist in the process; different studies pinpointed some gaps in health information for secondary school students; a study by Kamangu & Mbago (2024) found that while adolescents reported understanding key health topics, gaps in critical areas such as family planning remained. This was echoed in the work of Kavana (2021), which suggested a pressing need for targeted sexual and reproductive health education that resonates with adolescents' lives. The findings also highlight the perceived usefulness of accessing sexual and reproductive health education among marginalized youth in

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Tanzania(Ngilangwa et al., 2016; Nkata et al., 2019; Ngissa et al., 2024; Mwangosi et al., 2002) emphasized the same urge that health information is reaching the secondary school students, but some information remains irrelevant, and the lack of ability and skills to internalize the information remains a problem. The discussion above shows that some studies in Tanzania indicate a lack of usefulness in health information, while most studies demonstrate its usefulness.

3.6 Barriers to Accessing Health Information

Several barriers continue to obstruct health information accessibility for secondary school students (Table 4 in the detailed annex).

Table 4

Barriers to Accessing Health Information

SN	Key Findings	Authors
1	Structural and interpersonal obstacles hinder access to health information	Embleton et al. (2023), Mbarushimana et al. (2022),
2	Cultural taboos, social norms, and stigma significantly restrict access to sexual and reproductive health information.	Mbarushimana et al. (2022), Oware et al. (2023), Adan et al. (2018), Rehnström Loi et al., (2019), Mureithi et al. (2021)
3	Lack of training among educators and limited educational resources impede the effective delivery of health information.	Ogolla and Ondia (2019), Ninsiima et al.,(2019), Mambo et al.,(2021)
4	Economic factors, distance to healthcare facilities, and a lack of confidentiality all affect health-seeking behaviour.	Mambo et al. (2021), Muhwezi et al. (2015), Mutea et al. (2020)
5	Inadequate policy implementation and rigid cultural beliefs hinder access to sexuality education.	Sidze et al. (2017), Ngissa et al. (2024), Kavana (2021)

Things such as stigma, culture, taboos and geographical disparities have been mentioned as the most significant barriers that students face in accessing health information in East Africa (Sidze et al., 2017). Structural barriers, such as being out of school and needing permission to access information, as well as interpersonal barriers, such as being unable to ask for help when needed, were significant obstacles to SRH service utilization (Mwanga et al., 2008; Mbarushimana et al., 2022; Embleton et al., 2023).

Cultural stigmas surrounding sexual health education often lead to students' reluctance to seek information openly (Langat et al., 2024; Rehnström Loi et al., 2019). Muhwezi et al. (2015) also reported on challenges in accessing sexual health information because students perceived fathers to be strict, intimidating, unapproachable and unavailable for discussing matters related to sex and the fear of social judgment and confusion over sensitive topics such as contraceptive use can discourage students from utilizing available resources. Not only that, but also cultural sensitivities hinder open discussions about mental health, limited resources available for effective program delivery and resistance to change from educators, parents, and the broader community(Chadwick et al., 2022).

Poor infrastructure severely limits access to credible health information in many rural areas. A study by Mureithi et al., (2021) corroborated this, noting that economic challenges and cultural norms significantly restrict youth access to reproductive health information, particularly in Kenya. Similarly, Kenya has been reported to have challenges in policies that support comprehensive sex education. There is support for sex education from the Kenyan government. However, education sector policies have largely promoted an abstinence-only approach, resulting in a lack of comprehensiveness in the range of topics offered in curricula (Sidze et al., 2017). Following the discussion on policy constraints in access to health information, other countries can modify the policies to support access to health information, such as the governmental policies in Tanzania, which surround health education and also play an essential role, as noted by Mavura et al. (2022) where funding constraints often lead to poorly implemented health education curricula, resulting in limited engagement from both educators and students. Langat et al. (2024) further emphasized that stigma associated with discussing sexual health hinders adolescents from seeking information or assistance, leading to a lack of knowledge about available services.

The cross-cultural differences and institutional barriers are also critical; students from different socioeconomic backgrounds may experience varying degrees of access to health information, which affects the uniformity of educational outcomes across different schools (Oware et al., 2023). The findings from Ndayishimiye et al. (2020) and Seidu et al.(2022) underscore the challenges young people face in accessing sexual and reproductive health information due to inadequate resources and cultural norms that discourage open discussions. In particular, geographical discrepancies, socioeconomic status, and a lack of trained personnel complicate the education landscape and limit access to vital health information (Ogolla & Ondia, 2019; Kamangu & Mbago, 2024).

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Another barrier to accessing health information was the lockdown during the coronavirus pandemic (Mambo et al., 2021). Apart from cultural, geographical, and pandemic limitations to access information, there is a lack of credible sources of health information. Despite the availability of various sources of health information, challenges exist that hinder the full implementation of these sources in the dissemination of health information. In Uganda, Ninsiima et al. (2020) identified other challenges to the credibility and effectiveness of existing information sources, including a lack of capacity, inadequate financial commitment, and poor coordination among relevant sources. Additionally, a study by Apondi et al. (2021) highlighted the challenge of a lack of coordination between the Ministry of Health and the Ministry of Education, which could compromise the credibility and effectiveness of information sources. Chadwick et al. (2022) reported a lack of credible and effective sources of reproductive health information. This calls for ensuring that there are enough effective and credible sources of health information and making a conducive environment for them to play their roles of disseminating health information because they are crucial in shaping students' attitudes and behaviours regarding sensitive health issues such as HIV prevention, substance abuse, and reproductive health choices through the information they carry Mavura et al. (2022).In light of these barriers, there is an urgent need for policy interventions to enhance access to health information. For instance, integrating technology into health education, such as utilizing mobile phones and social media platforms, could provide alternative avenues for disseminating accurate health information. This approach can help mitigate the stigma associated with discussing sexual health openly, as suggested by Inwani et al. (2021), who highlighted the potential of mobile applications to improve adolescents' access to confidential sexual and reproductive health information.

3.6.1 Knowledge Gap/ Policy Implication of the Study

Despite extensive research on various aspects of health information among secondary school students in Tanzania, significant knowledge gaps remain: Demographic Variability: The current literature lacks comprehensive studies that analyze how demographic factors (such as age, socioeconomic status, and urban versus rural settings) affect students' health information needs and access to needed health information. Further research is needed to understand how these demographic variables impact students' health outcomes and the utilization of healthcare resources. There is a gap in students' perceptions of the effectiveness of different sources and channels for disseminating health information among secondary schools. Addressing these knowledge gaps through targeted research could lead to more effective health education strategies and interventions, ultimately fostering improved health behaviours among secondary school students in Tanzania and similar contexts.

IV. CONCLUSION & RECOMMENDATION

4.1 Conclusion

In conclusion, this systematic review highlights the crucial role of health information in influencing health behaviours among secondary school students in East Africa, particularly in Tanzania, Rwanda, Burundi, Kenya, and Uganda. Despite some progress, significant barriers persist, including cultural stigmas, limited access to reliable information sources, and variable perceptions of the usefulness of health information. Addressing these gaps through targeted research and tailored health education strategies will be crucial for promoting informed health choices, ultimately enhancing the health outcomes of adolescents in the region. Investigating the factors that influence health information needs, sources, and accessibility is necessary for effective health information dissemination.

4.2 Recommendations

The study recommends mixed-methods studies that explore the influence of demographic factors such as age and socioeconomic status on the health information needs and access of secondary school students in Tanzania. Investigation of how secondary school students perceive the effectiveness of various sources and channels (e.g., social media, school programs, peer discussions). The exploration of the factors that impact how secondary school students access health information. In addition, the study recommends a comparative study on health information access and use among East African member states, taking into consideration social and economic differences among member states to determine the role of gender, culture, and religion in shaping health information access and use, and health information seeking behaviour among secondary school students.

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REFERENCES

Adan, F. I., Githae, M. N., & Githae, C. A. M. N. (2018). Factors influencing access to reproductive health information services among young aged 15–24 in Garissa Municipality, Kenya. *International Journal of Contemporary Research and Review, 9*(08), 20537–20574.

Apondi, E., Wachira, J., Ayikukwei, R., Kafu, C., Onyango, J., Omollo, M., Genberg, B., Nyandiko, W., & Braitstein, P. (2021). Barriers to ART adherence among school students living with HIV in Kenya. *African Journal of AIDS Research, 20*(3), 232–237. https://doi.org/10.2989/16085906.2021.1979606

Ayubu, A. E., & Kabeya, L. D. (2019). Knowledge, attitudes, and use of family planning methods among female secondary school students in Tanzania. *Research Square*, 1–13. https://doi.org/10.21203/rs.2.13447/v1

Bishoge, O. K., Aremu, A. K., Ajayi, D. D., & Mfinanga, S. (2022). Awareness and knowledge of environmental health among secondary school students from Mtwara town in Tanzania. *Frontiers in Public Health, 20*(3), 1–15. https://doi.org/10.55131/jphd/2022/200301

Boateng, S., Baah, A., Boakye-Ansah, D., & Aboagye, B. (2022). Senior high school students' knowledge and attitudes toward information on their health in the Kumasi Metropolis. *Frontiers in Public Health, 9*(1), 1–11. https://doi.org/10.3389/fpubh.2021.752195

Chadwick, H., Baumann, A., Ogba, P., Banfield, L., & DiLiberto, D. D. (2022). Exploring adolescent engagement in sexual and reproductive health research in Kenya, Rwanda, Tanzania, and Uganda: A scoping review. *PLOS Global Public Health, 2*(10), 1–13. https://doi.org/10.1371/journal.pgph.0000208

Chesire, F., Mugisha, M., Ssenyonga, R., Rose, C. J., Nsangi, A., Kaseje, M., Sewankambo, N. K., Oxman, M., Rosenbaum, S. E., Moberg, J., Dahlgren, A., Lewin, S., Venkateswaran, M., Papadopoulou, E., & Oxman, A. D. (2024). Effects of the informed health choices secondary school intervention after 1 year: A prospective meta-analysis using individual participant data. *Trials, 25*(1), 2. https://doi.org/10.1186/s13063-024-08577-w

Dickson, M. (2023). Factors influencing utilization of reproductive health service among adolescents aged 12–19 years in Mbarara Municipality schools publications. *Newport International Journal of Research in Medical Sciences, 3*(1), 2.

Embleton, L., Braitstein, P., Di Ruggiero, E., Oduor, C., & Wado, Y. D. (2023). Sexual and reproductive health service utilization among adolescent girls in Kenya: A cross-sectional analysis. *PLOS Global Public Health, 3*(2), 1–14. https://doi.org/10.1371/journal.pgph.0001508

Håkansson, M., Mamo, R. A., Parwani, H. B., Otieno, B., & Makenzius, M. (2024). Unmet needs for comprehensive sexuality education: A qualitative study among secondary school students in Western Kenya. *American Journal of Sexuality Education, 19*(1), 42–57. https://doi.org/10.1080/15546128.2023.2189194

Handebo, S., Adugna, A., Kassie, A., & Shitu, K. (2021). Determinants of COVID-19-related knowledge and preventive behaviours among students in reopened secondary sectional study schools: Cross-sectional study. *Newport International Journal of Research in Medical Sciences, 3*(1), 1–10. https://doi.org/10.1136/bmjopen-2021-050189

Holst, C., Tschirhart, N., Ngowi, B., Noll, J., & Winkler, A. S. (2023). Utilizing community InfoSpots for health education: Perspectives and experiences in Migoli. *Health Promotion International, 38*(4), 1–11.

Inwani, I., Nduati, R., Carrion, C., & Macharia, P. (2021). An exploratory study of current sources of adolescent sexual and reproductive health information in Kenya and their limitations: Are mobile phone technologies the answer? *African Journal of Reproductive Health, 33*(3), 357–370. https://doi.org/10.1080/19317611.2021.1918311

Ito, K., Madeni, F. E., & Shimpuku, Y. (2022). Secondary school students' and peer educators' perceptions of adolescent education in rural Tanzania: A qualitative study. *Reproductive Health, 19*(1), 1–14. https://doi.org/10.1186/s12978-022-01418-6

Kalu, N. U., Igwe, U. O., Okorie, N. C., Okewumi, T. M., & Dahiru, U. (2022). Information-seeking behaviour, access to health information, and personal hygiene practices among secondary school students in Ohafia. *Tin-City Journal of Library, Archival and Information Science, 11*(1 & 2), 2022. http://www.tjolais.com/index.php/tjolais/article/view/90

Kamangu, A. A., & Mbago, M. C. Y. (2024). Provision of sexual health education in secondary schools: A multidisciplinary lens of stakeholders in southern highlands, Tanzania. *Heliyon, 10*(9), e30846. https://doi.org/10.1016/j.heliyon.2024.e30846

Kavana, N. (2021). Sexually transmitted infections among secondary school students. *Journal of Health Medicine and Nursing, 1*, 20–27.

Kemigisha, E., Bruce, K., Ivanova, O., Leye, E., Coene, G., Ruzaaza, G. N., Ninsiima, A. B., Mlahagwa, W., Nyakato, V. N., & Michielsen, K. (2019). Evaluation of a school-based comprehensive sexuality

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education program among very young adolescents in rural Uganda. *BMC Public Health, 19*(1), 1–11. https://doi.org/10.1186/s12889-019-7805-y

Langat, E. C., Mohiddin, A., Kidere, F., Omar, A., Akuno, J., Naanyu, V., & Temmerman, M. (2024). Challenges and opportunities for improving access to adolescent and youth sexual and reproductive health services and information in the coastal counties of Kenya: A qualitative study. *BMC Public Health, 24*(1), 1–11. https://doi.org/10.1186/s12889-024-17999-9

León-Himmelstine, C., Samman, E., Kyungu, E., et al. (2021). Mental health and psychosocial well-being among adolescents in Tanzania: Findings from a mixed-methods baseline study. *ODI Report*. London: ODI. https://odi.org/en/publications/mental-health-and-psychosocialwell-being-among-adolescents-in-tanzania-baseline

Lyimo, A. A., Guo, J., Mushy, S. E., & Mwilike, B. E. (2024). Use of contraceptives and associated factors among male adolescents in rural secondary schools, Coast Region, Tanzania: A school-based cross-sectional study. *Contraception and Reproductive Medicine, 9*(1), 1–11. https://doi.org/10.1186/s40834-024-00268-w

Mambo, S. B., Sikakulya, F. K., Ssebuufu, R., Mulumba, Y., Wasswa, H., Adomi Mbina, S., Rusatira, J. C., Bhondoekhan, F., Kamyuka, L. K., Akib, S. O., Kirimuhuzya, C., Nakawesi, J., & Kyamanywa, P. (2021). Challenges in access and utilization of sexual and reproductive health services among youth during the COVID-19 pandemic lockdown in Uganda: An online cross-sectional survey. *Frontiers in Reproductive Health, 3*, 1–10. https://doi.org/10.3389/frph.2021.705609

Mavura, R. A., Nyaki, A. Y., Leyaro, B. J., Mamseri, R., George, J., Ngocho, J. S., & Mboya, I. B. (2022). Prevalence of substance use and associated factors among secondary school adolescents in Kilimanjaro region, northern Tanzania. *PLoS ONE, 17*(9), 1–15. https://doi.org/10.1371/journal.pone.0274102

Mbarushimana, V., Conco, D. N., & Goldstein, S. (2022). "Such conversations are not had in the families": A qualitative study of the determinants of young adolescents' access to sexual and reproductive health and rights information in Rwanda. *BMC Public Health, 22*(1), 1–14. https://doi.org/10.1186/s12889-022-14256-9

Mitchell, K. J., Ybarra, M. L., Korchmaros, J. D., & Kosciw, J. G. (2014). Accessing sexual health information online: Use, motivations and consequences for youth with different sexual orientations. *Health Education Research, 29*(1), 147–157. https://doi.org/10.1093/her/cyt071

Mkumbo, K., Schaalma, H., Kaaya, S., Leerlooijer, J., Mbwambo, J., & Kilonzo, G. A. D. (2009). The application of intervention mapping in developing and implementing school-based sexuality and HIV/AIDS education in a developing country context: The case of Tanzania. *Scandinavian Journal of Public Health, 37*(suppl 2), 28–36. https://doi.org/10.1177/1403494808091345

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Group, T. P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine, 6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Muhwezi, W. W., Katahoire, A. R., Banura, C., Mugooda, H., Kwesiga, D., Bastien, S., & Klepp, K. (2015). Perceptions and experiences of adolescents, parents and school administrators regarding adolescent-parent communication on sexual and reproductive health issues in urban and rural Uganda. *Reproductive Health, 12*(1), 1–16. https://doi.org/10.1186/s12978-015-0099-3

Municipality, B., & Asiimwe, R. (2023). Health education and students' academic welfare. *Journal of Research, Innovation and Implication in Education (JRIIE), 7*(4), 117–129.

Mureithi, P. M., Otieno, S., & Njoroge, W. (2021). Relationship between access to reproductive health information and risky sexual behaviour among secondary school adolescents in Kiambu County, Kenya. *Journal of Health Medicine and Nursing, 6*(1), 14–39.

Mutea, L., Odhiambo, S., Kadiri, F., Michielsen, K., & Gichangi, P. (2020). Access to information and use of adolescent sexual reproductive health services: Qualitative exploration of barriers and facilitators in Kisumu and Kakamega, Kenya. *PLoS ONE, 15*(11), 1–17. https://doi.org/10.1371/journal.pone.0241985

Mwageni, E. (2006). The role of sexual reproductive health education in adolescents: Sexual behaviours in secondary schools in Morogoro Municipality, Tanzania. *African Journal of Reproductive Health, 10*(2), 228–242.

Mwanga, J. R., Jensen, B. B., Magnussen, P., & Aagaard-Hansen, J. (2008). School children as health change agents in Magu, Tanzania: A feasibility study. *Health Promotion International, 23*(1), 16–23. https://doi.org/10.1093/heapro/dam037

Mwangosi, I. E. A. T., Mwakatobe, K. M., & Astrom, A. N. K. (2002). Sources of oral health information and teaching materials for primary school teachers in Rungwe District, Tanzania. *International Dental Journal, 52*(6), 469–474. https://doi.org/10.1111/j.1875-595X.2002.tb00644.x

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Ndayishimiye, P., Uwase, R., Kubwimana, I., Niyonzima, J. D. L. C., Dzekem Dine, R., Nyandwi, J. B., & Ntokamunda Kadima, J. (2020). Availability, accessibility, and quality of adolescent sexual and reproductive health (SRH) services in urban health facilities of Rwanda: A survey among social and healthcare providers. *BMC Health Services Research, 20*(1), 1–11. https://doi.org/10.1186/s12913-020-05556-0

Ngilangwa, D. P., Mkuwa, S., & Meremo, A. (2016). Accessibility to sexual and reproductive health and rights education among marginalized youth in selected districts of Tanzania. *Pan African Medical Journal, 25*(2), 1–7. https://doi.org/10.11604/pamj.supp.2016.25.2.10922

Ngissa, S., Sanga, E., Nsanya, M. K., Kweka, B., & Malindisa, E. (2024). Curriculum-based sexual and reproductive health education: Revealing its relevance for risky sexual behaviours among secondary school students in Mwanza, Tanzania. *Reproductive Health, 21*(1), 1–10. https://doi.org/10.1186/s12978-024-01798-x

Ninsiima, A. B., Coene, G., Michielsen, K., Najjuka, S., Kemigisha, E., Ruzaaza, G. N., Nyakato, V. N., & Leye, E. (2020). Institutional and contextual obstacles to the implementation of sexuality education policy in Uganda. *Sex Education, 20*(1), 17–32. https://doi.org/10.1080/14681811.2019.1609437

Nkata, H., Teixeira, R., & Barros, H. (2019). A scoping review on sexual and reproductive health behaviours among Tanzanian adolescents. *Public Health Reviews, 40*, 1–15.

Ogolla, M. A., & Ondia, M. (2019). Assessment of the implementation of comprehensive sexuality education in Kenya. *African Journal of Reproductive Health, 23*(2), 110–120. https://doi.org/10.29063/ajrh2019/v23i2.11

Oware, P. M., De Angeles, K. J. C., Ntinyari, W., Langat, N., Mboya, B., Ekström, A. M., & Kågesten, A. E. (2023). "I wouldn't believe her at first"—A qualitative study of young people's sexual consent perceptions and negotiation in Nairobi informal settlements. *Journal of Interpersonal Violence, 38*(21–22), 11520–11544. https://doi.org/10.1177/08862605231185301

Panchaud, C., Keogh, S. C., Stillman, M., Awusabo-Asare, K., Motta, A., Sidze, E., & Monzón, A. S. (2019). Towards comprehensive sexuality education: A comparative analysis of the policy environment surrounding school-based sexuality education in Ghana, Peru, Kenya and Guatemala. *Sex Education, 19*(3), 277–296. https://doi.org/10.1080/14681811.2018.1533460

Pearce, L. B. T., & Ford, J. D. (2015). Systematic review approaches for climate change adaptation research. *Regional Environmental Change, 15*, 755–769. https://doi.org/10.1007/s10113-014-0708-7

Philipo, R., & Ntawigaya, N. J. (2025). Assessing the provision of healthcare services and their effects in rural secondary schools in Tanzania. *East African Journal of Education Studies, 8*(1), 146–158. https://doi.org/10.37284/eajes.8.1.2579

Rehnström Loi, U., Otieno, B., Oguttu, M., Gemzell-Danielsson, K., Klingberg-Allvin, M., Faxelid, E., & Makenzius, M. (2019). Abortion and contraceptive use stigma: A cross-sectional study of attitudes and beliefs in secondary school students in western Kenya. *Sexual and Reproductive Health Matters, 27*(3), 1–10. https://doi.org/10.1080/26410397.2019.1652028

Schmidt, L., Olorisade, B. K., McGuinness, L. A., Thomas, J., & Higgins, J. P. T. (2021). Data extraction methods for systematic review (semi)automation: A living systematic review. *F1000Research, 10*, 1–31. https://doi.org/10.12688/f1000research.51117.1

Seidu, A. A., Ameyaw, E. K., Ahinkorah, B. O., Baatiema, L., Dery, S., Ankomah, A., & Ganle, J. K. (2022). Sexual and reproductive health education and its association with ever use of contraception: A cross-sectional study among women in urban slums, Accra. *Reproductive Health, 19*(1), 1–10. https://doi.org/10.1186/s12978-021-01322-5

Sidze, E. M., Stillman, M., Keogh, S., Mulupi, S., Egesa, C. P., Mutua, M., Muga, W., Bankole, A., & Izugbara, C. O. (2017). From paper to practice: Sexuality education policies and their implementation in Kenya. *African Population and Health Research Center*.

Singh, A., Both, R., & Philpott, A. (2021). 'I tell them that sex is sweet at the right time'–A qualitative review of 'pleasure gaps and opportunities' in sexuality education programmes in Ghana and Kenya. *Global Public Health, 16*(5), 788–800. https://doi.org/10.1080/17441692.2020.1809691

Tengia-Kessy, A., & Health, H. K.-E. A. J. of P. (2016). Levels of knowledge and sources of information on sexually transmitted infections among secondary school youth in Dar es Salaam, Tanzania. *East African Journal of Public Health, 3*(2), 19–22. http://www.bioline.org.br/abstract?lp06011

Westeneng, J., Reis, R., & Berckmoes, L. H. (2020). *The effectiveness of sexual and reproductive health education in Burundi: Policy brief*. Dutch Research Council (NWO).

WHO. (2019). *Report of an adolescent health services barriers assessment (AHSBA) in the United Republic of Tanzania, with a focus on disadvantaged adolescents*. World Health Organization.

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Spoken word poetry: A creative catalyst for holistic human progress in Kenya

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ABSTRACT

This paper explores the potential of spoken word poetry as a creative art form that fosters holistic human progress, offering an innovative solution within a multi-disciplinary framework. Rooted in performance theory, conceptualized by Judith Butler and drawing upon the vibrant Kenyan spoken word scene, this study examines how artistic strategies employed by youth poets articulate and challenge subalternity, contributing to social change and individual empowerment. Focusing on the performative aspects of spoken word, the analysis demonstrates how poets utilize embodied performance, linguistic innovation, and collaborative artistic practices to create spaces for dialogue and critical reflection. By amplifying marginalized voices and experiences, particularly those of young people navigating complex social and economic realities, spoken word poetry becomes a powerful tool for raising awareness about inequality and advocating for social justice. Furthermore, the paper argues that the interdisciplinary nature of spoken word poetry – blending elements of literature, performance studies, sociology, and psychology – allows for a more comprehensive understanding of its impact. By connecting personal narratives to broader socio-political contexts, spoken word poetry encourages critical thinking, empathy, and a sense of collective responsibility. Ultimately, this research posits that Kenyan spoken word poetry, through its innovative artistic strategies and its engagement with youth subalternity, serves as a model for fostering holistic human progress. It highlights the transformative power of creative expression in promoting social change, empowering individuals, and building more equitable and just societies. This study contributes to the broader discourse on arts-based approaches to development and provides valuable insights for researchers and practitioners working across diverse disciplines.

Keywords: Artistic Strategies, Critical Thinking, Empathy, Performance, Spoken Word, Subaltern, Youth

I. INTRODUCTION

Spoken word poetry, a dynamic creative art form, holds immense potential for driving holistic human progress, particularly within marginalized communities. This paper explores how Kenyan youth poets are harnessing the power of spoken word to challenge their experiences of subalternity and contribute to meaningful social change and individual empowerment. By amplifying marginalized voices and connecting personal narratives to broader socio-political contexts, spoken word poetry encourages critical thinking, empathy, and a sense of collective responsibility, raising awareness about inequality and advocating for social justice. This research argues that Kenyan spoken word poetry, through its innovative artistic strategies and its engagement with youth experiences, serves as a model for fostering holistic human progress, demonstrating the transformative power of creative expression in building more equitable and just societies.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study adopts a theoretical framework rooted in performance theory, particularly focusing on the concepts of performativity and embodiment. Performativity, as defined by Butler (1990), suggests that identities are not fixed but are actively constructed and re-constructed through repeated performances. In the context of spoken word poetry, this means that poets are not simply expressing pre-existing identities but are actively shaping them through their performances. Furthermore, the concept of embodiment, drawing on the work of scholars like Schechner (2013), emphasizes the importance of the body in performance. Spoken word poets use their bodies – their voices, gestures, and movements – to convey meaning and connect with their audience on an emotional level.

In addition to performance theory, this paper also draws on critical theories of subalternity and social justice. By examining how spoken word poetry provides a platform for marginalized voices, we aim to understand how artistic expression can challenge dominant narratives and advocate for social change. The framework allows us to analyse how poets negotiate power dynamics and resist oppressive structures through their artistic practices. The work of scholars in

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postcolonial studies (e.g., Bhabha,1994) informs analysis of how poets reclaim their narratives and challenge colonial legacies through their work.

III. METHODOLOGY

This study adopts a qualitative research design, employing close textual readings of selected spoken word poems by Kenyan youth poets alongside analysis of publicly available live performance videos. The selection of poems and performances focuses on works that explicitly engage with themes of social justice, inequality, and youth empowerment.

Data analysis involves a combination of thematic analysis and discourse analysis. Thematic analysis will be used to identify recurring themes and patterns in the selected poems, while discourse analysis will examine the language and rhetorical strategies employed by the poets. More specifically, this involved watching the videos severally while taking notes on the tone, gestures and non-verbal communication.

Furthermore, this study also draws on secondary sources, including academic articles, books, and reports on the Kenyan arts scene and youth development. By triangulating data from multiple sources, we aim to provide a comprehensive and nuanced understanding of the role of spoken word poetry in fostering holistic human progress in Kenya.

IV. FINDINGS & DISCUSSION

4.1 The Kenyan Spoken Word Scene: A Crucible of Subaltern Expression and Holistic Human Progress

Linguistic innovation is a key element that allows spoken word to effectively represent subaltern experiences. Poets often employ vernacular languages, slang, and code-switching to create a more authentic and relatable voice. This linguistic innovation not only resonates with the target audience but also challenges the dominance of standard languages and reinforces the cultural identity of marginalized communities (Makoni & Pennycook, 201o). By using language that reflects their lived realities, poets can reclaim their narratives and challenge the dominant discourse that often silences or misrepresents their experiences. For example, a poet addressing issues of police brutality might incorporate Sheng, a popular urban slang, to connect with a younger audience and critique the language used by law enforcement. Consider the following lines from a spoken word performance focusing on youth unemployment:

> "*Vitu kwa ground ni ngumu, bro. Graduation ilifika, but job bado hatujaona. Tunahangaika tu, roho inauma. Wanatuambia tujiinue, but wapi hio nguvu?" (Things on the ground are tough, bro. Graduation came, but we still haven't seen jobs. We are just hustling, our hearts ache. They tell us to pull ourselves up by our bootstraps, but where will we get that strength*".

This use of Sheng immediately establishes a connection with the audience, conveying the frustration and hopelessness felt by many young Kenyans struggling to find employment. Collaboration is another vital aspect of spoken word that facilitates the amplification of subaltern voices. Spoken word events and workshops often create spaces for dialogue and interaction among poets and audience members. This collaborative environment fosters a sense of community and allows individuals to share their experiences, learn from each other, and collectively address social issues (Bishop, 2025). The sharing of personal narratives can create a collective identity and empower individuals to become active agents of change. Mentorship programs within the spoken word scene also provide opportunities for established poets to guide and support emerging voices, ensuring that the platform remains accessible and inclusive. Specifically, spoken word poetry allows subalternity to be identified and challenges the notion.

> "*They say we are lazy, that we lack ambition. They see our struggles, but not the system that chained us. But we are rising, voices united, reclaiming our future. No longer silent, no longer invisible.*"

Here, the poet directly challenges the stereotype of laziness often attached to unemployed youth, highlighting the systemic factors that contribute to their marginalization and asserting their agency to create change. This counter-narrative is essential for dismantling harmful stereotypes and promoting a more nuanced understanding of the challenges faced by subaltern communities. By the utilization of the above aspects of performance, Kenyan spoken word artists frequently address issues of poverty, inequality, and social injustice in their work. They use their performances to expose the realities of life for those living on the margins, often drawing on personal experiences to create powerful and emotionally resonant pieces. Take, for example, a fictionalized excerpt reflecting common themes in Kenyan spoken word:

> "*They say we are invisible, ghosts in our own land,/But I see the fire in your eyes, the struggle in your hand./We are the forgotten, the silenced, the unheard,/But our voices will rise, like thunder, a powerful word."*

This illustrative verse, while fictionalized, captures the essence of many spoken word poems aimed at reclaiming visibility and agency for marginalized communities. This resonates with scholars like Conquergood (2002), who

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emphasizes the importance of "performative ethnography" in giving voice to marginalized communities and challenging dominant power structures.

Furthermore, spoken word poetry allows for a diverse range of voices and perspectives to be heard. Young people, in particular, have found a powerful voice in spoken word, using it to express their frustrations, aspirations, and hopes for the future. Many scholars point to the potential of youth-led artistic movements to ignite social change. According to Ginwright (2010), youth activism, particularly through creative expression, plays a critical role in challenging systemic inequalities and empowering marginalized communities. Consider this illustrative example:

> "*I am the youth, the future, they say,/But the future is bleak, in so many ways./Unemployment, corruption, a broken system,/But I will not be silenced, I will stand and resist them*."(Mary Wambui spoken word)

This excerpt underscores the ability of spoken word to act as a conduit for young voices to express their disillusionment with the status quo and demand a better future.

The power of spoken word also lies in its ability to foster dialogue and create spaces for critical reflection. Through their performances, spoken word artists engage with audiences, prompting them to think critically about social issues and consider alternative perspectives. This dialogic aspect of spoken word is crucial for fostering understanding and building solidarity across different social groups. As Bakhtin (1981) argues, language is inherently dialogic, and meaning is created through the interaction between speaker and listener. Spoken word poetry, with its emphasis on live performance, embodies this dialogic principle, creating a dynamic exchange between the artist and the audience. This dynamic exchange is particularly powerful when addressing sensitive or controversial topics, as seen in the fictional verse:

> "*We whisper secrets in the shadows, afraid to speak our truth,/But on this stage, our voices echo, a testament to our youth./We challenge the norms, question the beliefs,/Planting seeds of change, offering sweet reliefs."*

This illustrates how spoken word stages can provide a safe space for voicing previously suppressed or marginalized viewpoints.

4.2 Creative Expression and Social Change

By engaging with critical social issues, spoken word poets can raise awareness, spark dialogue, and inspire action. The performative nature of spoken word enhances its impact, as audiences are not only presented with information but also emotionally engaged through the poet's delivery, body language, and vocal inflection.

Schechner (2013) emphasizes the transformative power of performance, arguing that it can challenge existing social norms and create spaces for collective action. Kenyan spoken word artists often use their performances to address issues such as corruption, gender inequality, and environmental degradation. Their words act as a call to action, urging audiences to reconsider their perspectives and become active participants in shaping a better future.

Beyond its artistic value, spoken word poetry actively contributes to social change by raising awareness of inequalities and promoting empathy. In Kenya, where young people face issues like unemployment and limited access to education, poets use their platforms to expose these realities and advocate for reform. This form of expression acts as a catalyst for change, encouraging listeners to reflect on their roles in society and take steps toward justice (Mwangi, 2010). By sharing personal stories, poets bridge gaps between individuals and communities, fostering a sense of shared responsibility.

A notable example is how spoken word has been used to address gender-based violence and women's rights in Kenya. Poets often incorporate vivid imagery and direct appeals to highlight the need for equality. In one powerful piece, a poet declared,

> "*She is not a statistic; she is a storm, rewriting the scripts of silence with every word she speaks*" (Wambui, 2017, p. 19).

This quote underscores the transformative power of spoken word, where creative expression becomes a tool for empowerment and advocacy. Such performances not only challenge harmful norms but also inspire audiences to support social movements, leading to tangible outcomes like policy discussions and community initiatives.

Moreover, spoken word's accessibility makes it an effective vehicle for social change in diverse settings. Unlike formal art forms that may require resources or institutional support, spoken word can be performed in public spaces, schools, or online platforms, reaching wide audiences at little cost. In Kenya, this has enabled young people from rural and urban areas to engage in creative expression as a means of protest and healing.

These examples show how spoken word not only reflects social issues but also actively shapes public discourse, encouraging critical thinking and collective action. A line that exemplifies this is,

> "*We are the architects of change, armed with words, building bridges of understanding across the chasms of division."*

It not only encapsulates the spirit of proactive change but also highlight the power of language in fostering social cohesion and dismantling barriers. This reflects Appiah's (2006) argument for cosmopolitanism, where art and dialogue can foster understanding and respect across cultural boundaries.

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4.3 Empowerment Through Artistic Collaboration and Linguistic Innovation

The Kenyan spoken word scene is characterized by a spirit of collaboration and innovation. Poets often work together, sharing their skills, providing feedback, and supporting each other's creative development. This collaborative environment fosters a sense of community and empowers individual artists to push the boundaries of their craft.

One of the key ways spoken word empowers individuals is by providing a space for shared storytelling and the amplification of marginalized voices. Collaboration within spoken word circles often involves poets sharing personal experiences, weaving them into collective narratives that resonate with wider social issues. This process validates individual experiences while simultaneously demonstrating their interconnectedness, fostering a sense of belonging and shared identity. As noted by scholars of performance theory, the act of sharing stories in a public forum can be transformative, allowing individuals to reclaim agency over their narratives (Carlson, 1996). This is exemplified by collective pieces that tackle societal issues such as corruption, lack of access to healthcare, or even challenges with relationships. For example, a collaborative poem addressing the challenges faced by young women in urban areas might include lines reflecting diverse experiences, yet united by the common thread of resilience. An example might include the speakers saying

"*I see you, sister, fighting for your voice, for your right, in this society that wants to silence us*."

This kind of shared expression creates a supportive environment where individuals feel validated and empowered to speak out against injustice.Furthermore, artistic collaboration in spoken word fosters a sense of community and collective responsibility. The creation and performance of spoken word often involve workshops, open mic nights, and collaborative writing sessions, all of which promote interaction and dialogue among participants. Through these interactions, poets learn from one another, share their skills and experiences, and build strong social networks. This sense of community can be particularly empowering for individuals who may otherwise feel isolated or marginalized. The collaborative creative process itself becomes a site of empowerment, where individuals contribute to a shared vision and witness the impact of their collective efforts. Poets are known to perform together to advocate for good governance and social justice. An example of this can be illustrated in the following lines:

"'*With our voices, we rise as one, /Demanding justice, demanding change begun*"

This shared commitment to social justice fosters a sense of collective responsibility and motivates individuals to take action to create positive change in their communities. Moreover, spoken word as a collaborative art form facilitates critical self-reflection and social commentary. The process of crafting and performing spoken word poetry encourages poets to examine their own experiences and perspectives, as well as to critique the social and political structures that shape their lives. Through collaboration, poets are exposed to diverse viewpoints and challenged to think critically about their own assumptions and biases. This process of critical self-reflection can be deeply empowering, as it allows individuals to gain a deeper understanding of themselves and their place in the world. Spoken word performances often serve as platforms for social commentary, where poets use their art to challenge injustice, raise awareness about important issues, and advocate for change. This kind of artistic activism can be a powerful tool for social change, as it allows individuals to express their dissent and mobilize others to take action (Sommer, 2006). The act of speaking truth to power, even in a poetic form, can be incredibly empowering for both the performer and the audience. The poem's collaborative nature ensures the message is collectively crafted, making it more powerful and impactful. An example of collaborative poetry tackling the issue of police brutality might echo sentiments such as

"Our stories, our pain, interwoven in rhyme, / A symphony of voices, demanding justice, one crime at a time."

Furthermore, Kenyan spoken word poets demonstrate remarkable linguistic innovation, blending English, Swahili, and other local languages to create a unique and dynamic form of expression. This linguistic fusion not only reflects the multilingual reality of Kenyan society but also allows poets to connect with a wider audience and communicate complex ideas in a relatable and engaging manner.

By combining different languages and artistic styles, Kenyan spoken word poets are creating a new artistic landscape that reflects the diversity and dynamism of their nation. This echoes Bhabha's (1994) concept of hybridity, where cultural exchange and fusion create new forms of expression that challenge traditional notions of identity and belonging.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Kenyan spoken word poetry stands as a testament to the transformative power of creative expression. It illustrates how art can serve as a catalyst for holistic human progress by empowering marginalized voices, fostering critical dialogue, and promoting social change. By embracing innovative artistic strategies and engaging with the complexities of Kenyan society, spoken word poets are creating a vibrant and dynamic cultural landscape that inspires hope, challenges injustice, and contributes to a more equitable and just future. This study suggests that investing in the

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creative arts, particularly spoken word poetry, can be a powerful strategy for promoting holistic human development and fostering thriving communities. Kenyan spoken word poetry emerges as a potent force for holistic human progress by offering a platform for marginalized youth to articulate and challenge their subaltern experiences. Through innovative artistic strategies, these poets amplify silenced voices, connect personal narratives to broader socio-political contexts, and foster dialogue around inequality and social justice. The art form becomes a vehicle for raising awareness, encouraging critical thinking, and cultivating a sense of collective responsibility, ultimately empowering individuals and contributing to the creation of more equitable and just societies. Kenyan spoken word, therefore, serves as a valuable model for understanding the transformative power of creative expression in driving positive social change and fostering human development**.**

Declaration of Conflict of Interest

The authors attest that they have no conflicting interests that could influence the quality of the work reported in this study.

REFERENCES

Appiah, K. A. (2006). *Cosmopolitanism: Ethics in a world of strangers*. W. W. Norton & Company.

Bhabha, H. K. (1994). *The location of culture*. Routledge.

Bishop, C. (2025). The social turn: Collaboration and its discontents. In *The performance studies reader* (pp. 250–257). Routledge.

Butler, J. (1990). *Gender trouble: Feminism and the subversion of identity*. Routledge.

Carlson, M. (1996). *Performance: A critical introduction*. Routledge.

Conquergood, D. (1992). Ethnography, rhetoric, and performance. *Quarterly Journal of Speech, 78*(1), 80–97.

Ginwright, S. A. (2010). Peace out to revolution! Activism among African American youth: An argument for radical healing. *Young, 18*(1), 77–96.

Makoni, S., & Pennycook, A. (Eds.). (2010). Disinventing and reconstituting languages. *Applied Linguistics, 31*(1), 159–163.

Mwangi, E. M. (2010). *Africa writes back to self: Metafiction, gender, sexuality*. State University of New York Press.

Schechner, R. (2013). *Performance theory*. Routledge.

Sommer, D. (2006). *Bilingual aesthetics: A new sentimentalism*. Duke University Press.

Wambui, N. (2017). The impact of religion on values and behavior in Kenya. *European Journal of Philosophy, Culture and Religious Studies, 1*(1), 50–65.

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The effect of information technology governance on successful project management in public agencies: A case of Tanzania Ports Authority (TPA)

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ABSTRACT

The study examined the effect of Information Technology (IT) governance on successful project management at Tanzania Ports Authority (TPA). This study was guided by the IT governance framework but also looked at the project management theory. The study was cross-sectional and was conducted at Tanzania Ports Authority. The population of the study was workers and leaders of the Tanzania Ports Authority. The sample size of the study was 95 respondents who were found randomly and purposively. Primary data were collected using questionnaires and interviews. Data analysis was done using the Statistical Package for Social Sciences (SPSS) and thematic analysis. The findings showed that IT governance practices are aligned with strategic objectives; however, financial and human resources are not allocated to IT projects based on their strategic importance. The study also found that risk management mechanisms in IT projects at Tanzania Ports Authority are effective. It was also found that organizational silos, risk-averse culture, insufficient funding, and digital skills gaps are some of the challenges facing TPA in implementing IT governance frameworks. Therefore, it is recommended that TPA should adopt a structured approach to allocate financial and human resources based on the strategic value of IT projects. It is also recommended that a dedicated IT budgeting process should be established to ensure that high-priority IT projects receive adequate funding. It is recommended that TPA should strengthen its cybersecurity framework by implementing advanced security protocols, regular vulnerability assessments, and employee cybersecurity awareness programs to address emerging threats.

Keywords: Information Technology Governance, Project Management, Public Agencies, Tanzania Ports Authority

I. INTRODUCTION

Not only in public agencies, the growth of information technology in governance matters cut across the globe, as far as the project management is concerned. All the organizations in public agencies apply Information Technology (IT) governance in the management of projects simply because it enables to easily track the achievement on the strategic objectives in alignment with the goals of the organization. Weill and Ross (2021) defined information technology governance as whole the processes, all the structures, as well as all the mechanisms which guide the utilization of IT resources effectively in achieving the goals of the organization.

The role that IT governance plays in project management base on giving a framework or base in which decision is made in an organization, by measuring the performance and managing risk of all the projects of an organization which are IT related (Highsmith, 2020). Public sectors have large scale and complex operations which are not easy to handle manually. The use of IT governance makes it easier for the organization to manage these large scale and complex operations of an organization in public agencies. Strategic alignment of the objectives of the organization with the IT initiatives in project management lies more on IT governance. Without IT governance it is very difficult to align the objectives of the organization with the IT initiatives (Tan et al.,2019).

In order to deliver outcomes which are measurable it is important to define roles and responsibilities, it is important to make sure that resources are efficiently allocated, it is also important to make that there is accountability, all these are enabled by IT governance (De Haes & Grembergen, 2020). So, in that matter IT governance makes sure that accountability is in place, roles and responsibilities are defined, but also resources are efficiently allocated. All the above roles are just a few roles of IT governance among many others when it comes to project management in technological way.

Furthermore, more IT governance makes it possible for the organization to easily have a follow-up on its key performance indicators (KPIs), the follow-up also on the frameworks for risk management, as well as follow-up on strategies of making sure that stakeholder is engaged, as far as quality and sustainability of the project is concerned. The utilization of IT governance simplifies the way in which risk management is handled, key performance indicators are handled, but also simplifies the way in which stakeholder is engaged in project management.

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The utilization of IT governance in public agencies has played an important role in making sure that everything works well, when compared to the manual way of project management which has a number of challenges including limited resources, regulatory requirements, as well as changing technological environments. Taking for example the Tanzania Ports Authority (TPA), it has been very easy to manage projects on infrastructure, a number of them by utilizing fully IT systems in making sure that operational efficiency is in place (Musomba & Njau, 2023). IT governance has enables TPA to align its strategic goals with these projects by reducing risks on technology adoption, resources constraints and the satisfaction of stakeholders in executing these projects. Through IT governance it has been very easy to have quick follow-up of these projects while being executed all the time (Musomba & Njau, 2023).

It has been evidenced by different scholars that public organization which has been able to apply IT governance have been getting higher achievement of the projects in most developing countries (Alotaibi et al.,2022). Through IT governance developing countries have been able to make their projects more successful. Although IT governance has a number of advantages when applied in managing projects, yet there are a number of challenges which limits its adoption. Some of the challenges that were pointed out included lack of sufficient experts in IT, lack of clear governance structures, but also resistance to change by some organization (Huang et al.,2023). Some organizations for example are not easily read to adopt changes, moving from traditional ways of project management of modern ways of project management through IT governance.

Being the case, the Tanzania Ports Authority has no choice other than adopting more IT solutions in order to compete in ports industry. In order for TPA to make sure that it is efficient delivering services but also it must be accountable all the time (Musomba & Njau, 2023). So, the integration of more and more IT solutions is very important as far as the efficiency of TPA activities are concerned. This study therefore aims to examine the effect of IT governance on successful project management at TPA.

1.1 Statement of the Problem

Successful project management in public organizations in modern era for public organizations like the Tanzania Ports Authority depends much on IT governance use in all aspects. Despite the fact that Tanzania Ports Authority has adopted IT systems over a period of time yet there are challenges as far as the alignment of IT projects and the TPA goals in supporting strategic operations on the development of infrastructure, challenges in resource optimization, but also challenges in reducing risks. Project execution inefficiencies, insufficient number of experts, but also challenges in decision making are some of the challenges which face public agencies, TPA being one of them (Musomba & Njau, 2023).

The problem of delays in deliveries of the imports from abroad, cost overruns, as well as less performing IT projects are also major challenges that discourage stakeholders of the TPA. These challenges show that there is a gap that this study needs to address on how IT governance is aligned with the TPA project strategic goals. Although the role of IT governance is to make sure that project management is successful, yet this is not the case with the Tanzania Ports Authority because still their delays, cost overruns, but also less performing IT systems. This study addressed these gaps by examining the effect of IT governance on successful project management at TPA.

1.2 Research Objectives

i. To what extent do IT governance practices aligned with strategic objectives of TPA
ii. To evaluated the effectiveness of risk management mechanisms in IT projects at TPA
iii. To identified challenges facing TPA in implementing IT governance frameworks

1.3 Research questions

i. to what extent do IT governance practices aligned with strategic objectives of TPA?
ii. how effective are the risk management mechanisms in IT projects at TPA?
iii. what are the challenges facing TPA in implementing IT governance frameworks?

II. LITERATURE REVIEW

2.1 Theoretical Review

This section looked at the IT governance framework, but also looked at the project management theory.

2.1.1 IT Governance Framework

The structured approach which makes sure that IT enhances and support an organization in achieving its goals, by aligning it objectives and strategies, but at the same time making sure that risk is managed and resources are optimized is what we call IT governance. So, these frameworks under the IT governance include structures, processes, and policies through which decision making is based in an organization (Kerzner, 2020). Thus, in IT governance there must be policies in place, structures must be in place, but also processes must be in place to be accommodate in IT systems, in

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order for the system to make sure that the goals of the organization are achieved, but by aligning the strategies and objectives of that organization (Huang et al.,2023).

There is a number of IT governance frameworks in place to data, some of which include the International Standards Organization (ISO) 38500, Control Objectives for Information and Related Technologies (COBIT), and Information Technology Infrastructure Library (ITIL). Each of these has its own procedures to follow when an organization needs aligning its strategies and its objectives in a given project. The COBIT, for example, is more applicable in aligning strategies and objectives, it helps in risk management, but also more applicable in IT resource optimization, but also in all being specified in delivering goals of an organization. If not adopted yet, the TPA can adopt COBIT in order to help it align its objectives with strategies in order to achieve TPA objectives in port operations (Weill & Ross, 2021).

Coming to Information Technology Infrastructure Library (ITIL), being another kind of IT governance framework, also makes sure that the project is executed according to the needs of the organization, by ensuring alignment of the strategies and objectives as far as the organization goals are concerned. If not adopted yet, TPA can adopt ITIL in order the framework to help in aligning strategies with objectives of TPA by making sure that its goals are achieved. By adopting ITIL, the TPA can find itself in a better position of getting more profit in its port projects. The main base of ITIL is ensuring that from time-to-time projects are more improved to deliver more, but also to make sure that delivery of the value required is in place in public agencies (Aljitri et al.,2023).

Coming now that ISO 38500 as another kind of IT governance framework, it provides principles of IT governance which are of high level, and plays a better in making sure that senior management in an organization are in a position of oversee all its IT decisions. Through ISO 38500 the management of an organization knows all steps undertaken in IT systems from one stage to another in project management. If not adopted by TPA, the adoption of ISO 38500 by TPA will enable its top management to have a look at all procedures undertaken in project management through IT systems. ISO 38500 ensures that the projects are managed properly in regard to adherence to principles but also compliance of regulatory standards, in making sure that the expectation of the public is met (Nwachukwu & Asongu, 2019)

In actual sense the utilization of the mentioned explained IT governance frameworks by TPA will enable it in making sure that issue like delays, overruns in budget, and performance matters are in controlled easily. Furthermore, the utilization of IT governance frameworks above will also enable TPA to achieve success of the projects, but also optimization of resources such as human, technological or financial, which at the end of the day will result to achievement of the TPA mission.

2.1.2 The Project Management Theory

The project management theory provides a base for planning, organizing and executing projects, with the aim of getting results in allocated time, budget, but also by observing resources in place (PMI, 2021). In other words, the project management theory emphasizes more in making sure that the project planned in in accordance to the available resources, budget, but also adheres to the time required for the completion. In fact, it is very important to consider all these parameters when conducting a project in order to make sure that all the projects initiated are completed in time, but also with the allocated budget and resources put in place (PMI, 2021).

Project management methodologies are many; however, some of the common methodologies are Project Management Body of Knowledge (PMBOK), systems theory, as well as the Agile. All these methodologies provide a base for managing different projects. The Project Management Institute (PMI) developed PMBOK to enable project management in different organizations. In fact, PMBOK has been one of the most popular and used project management methodologies in management of projects. The PMBOK concentrates in areas like scope, cost, quality, time, and risk management, at the same time PMBOK works according to the project stages which include initiating, planning, executing, monitoring and controlling, as well as closing (PMI, 2021). All these stages of the project are followed in PMBOK when used in managing projects. So just like the case of TPA, PMBOK principles can help it in making sure that its organizational goals go hand in hand with its strategies and objectives.

On the other hand, Agile as another kind of project management methodology, helps organizations in situations where their environmental changes in deciding to be flexible in order to accommodate changes in project management. The breaking down of the projects into smaller parts that can be easily manageable by the organization helps it to cope with environmental changes and enable it to easily adjust according to the changes and being able to provide feedback quickly to stakeholder (Highsmith, 2020). Therefore, through Agile allowing flexibility can enable TPA to change according the available environment such as changes in technology, occurrence of external factors, like changes in market demands, but also changes in government regulations. So, in this way Agile can play an important role for making TPA not to get losses when there are environmental changes.

Coming now to Systems Theory, as another project management theory, it bases more in connecting all the components of the projects which include, resources, processes and people, to work as one unit. When the organization has large and complex IT projects taking the case of TPA, the use of TPA can enable the interconnection of all the

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components and at the end of the day making projects more easily to be managed. So, through Systems theory organization come more informed and make decisions on what they have known already, but also the systems theory help organization to have resource optimization, at the same time ensure that the project is successful (Kerzner, 2020).

2.2 Empirical Review

2.2.1 The Extent to which IT Governance Practices are Aligned with Strategic Objectives

A study by Tan et al. (2019) studied IT governance alignment practices and the objectives of an organization. In their study objectives of the organization was the dependent variable while IT governance was the independent variable. In their study COBIT as one of the IT governance frameworks was adopted, and played role in showing the effectiveness the goals of an organization and the IT operations. Their findings indicated that better resource utilization, enhanced compliance with regulations, as well as more trust of stakeholders was engineered by adoption of IT governance frameworks in these organizations.

Another study by Sharma et al. (2019) found that the use of TOGAF framework in North America and Europe helped enterprises abroad in making the alignment between IT architecture and the objectives of the organizations via planning which is systematic, but also management of resources. However, the study also found that there are challenges in the use of TOGAF in those enterprises. These challenges included resistance to change by the management of some of the top management of these organizations but also difficult in integrating legacy systems.

Another study by Tan et al. (2019) revealed that GEIT played a good role in enabling enterprise to get optimal IT investments, furthermore enterprises were in a position to reduce risk, but also organizations were in a position to comply with requirements of both law and regulations. The study also pointed out the importance of involving stakeholders in decision making matters as well as having clear communication in all business units.

2.2.2 The Effectiveness of Risk Management Mechanisms in IT Projects

Tan et al. (2019) found that one of the reasons for the failure was exceeding their budgets (18 percentage). Furthermore, other reasons for the failure of objectives included lack of clear objectives, non-involvement of top management, but also lack of sufficient execution and control. All the above-mentioned reasons were found to be the major reasons for the failure of different IT projects globally. Alotaibi et al. (2022) found that risk management mechanisms alignment with organization strategy was very important in enhancing the effectiveness of these FinTech industries. Meaning that the alignment of risk management mechanisms with strategies of the organization was the better means or reducing risks in these FinTech industries.

2.2.3 Challenges facing Public Agencies in Implementing IT Governance Frameworks

Another study by Tan et al. (2019) found that one of the challenges facing public agencies in implementing IT governance framework is organizational silos. The study further pointed out that organizational silos do affect the IT governance frameworks implementation in a number of government agencies. The study pointed out that organizational silos result into divided strategies and decisions making processes which at the end of the day affect the speed with which an organization adopt or implement an integrated IT governance model. In other words, organizational silos not only delay decision making in initiating projects, but also results in non-completion of the projects initiated.

Huang et al. (2023) pointed out that one of the challenges facing public agencies in implementing IT governance frameworks is risk-averse culture. The study further details that resistance to change do affect organizations when in need to adopt new IT technologies in project management. In organizations there are people who are not ready for change; they always rely on the traditional methods of doing things. To such people when a new technology comes, they are not easily ready to adopt it, and as a result delaying the progress of the organization. Furthermore, the study also found that budget inefficiency also does affect the implementation of IT governance frameworks. Lack of sufficient budget allocated in IT governance frameworks to limit project management initiatives.

Another study by Sharma et al. (2019) showed that another challenge facing public agencies in implementing IT governance frameworks in their organizations are gaps in digital skills. The study further pointed that lack of digital skills affects the way in which IT governance frameworks are implemented in organization. Technical know-how is very important as far as the IT governance implementation in project management is concerned.

Another study by Techtarget (2023) found that complexities in technology, which include legacy systems, as well as integration issues, do affect the implementation of modern IT governance frameworks. For better technology implementation the IT personnel need to be more informed on how to use the available modern technology in order to apply it in managing projects, and at the end of the day projects giving out expected positive results.

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III. METHODOLOGY

This study adopted cross sectional design because it is a one stop design that allows the collection of data only once from field. Furthermore, due to the time constraints in conducting this study for the award of master degree, cross sectional research design is of the best choice for the researcher. The Tanzania Ports Authority in Dar es Salaam was the base for carrying this study. Tanzania Ports Authority in Dar es Salaam is chosen due to the reason that TPA is the main government agency dealing with maritime in the country; furthermore, no similar studies have been conducted at TPA.

The population for this study included workers and the management of Tanzania Ports Authority, who are approximated to be 2000. The sample size of the study was 95 respondents, of which 80 respondents were the ordinary TPA workers while 15 respondents were the TPA top management. Both random and purposive sampling techniques were used. Specifically, purposive sampling was used in getting respondents from the top management of TPA, while random sampling was used in getting respondents from the ordinary TPA workers.

Primary data was the most important in answering the research questions in this study. Both the questionnaire and interview guide were used in data collection. Quantitative data was analysed using descriptive statistics, correlation and by regression, while qualitative data was described thematically. Thematic analysis was done by looking at the common themes from the interview conducted.

IV. FINDINGS & DISCUSSION

4.0 Summary of the section

This section presents both descriptive and inferential statistics. Under descriptive statistics, the section presents characteristics of respondents, the extent to which IT governance practices are aligned with strategic objectives of TPA, the effectiveness of risk management mechanisms in IT projects at TPA, as well as challenges facing TPA in implementing IT governance frameworks. Under inferential statistics, the section presents correlation between the variables as well as regression results.

4.1 Descriptive Statistics

4.1.1 Characteristics of Respondents

Upon doing the analysis as far as gender of respondents are concerned, the study findings revealed that 68.4 percent of the respondents were males while 31.6 percent of the respondents were females as shown in figure 1 below. The majority of the respondents for that matter were male. By having a large number of males than females in this study is a good representation because due to the nature of activities conducted at TPA require more male than female. So, for that matter it was worthwhile having a large number of males in this study to represent men.

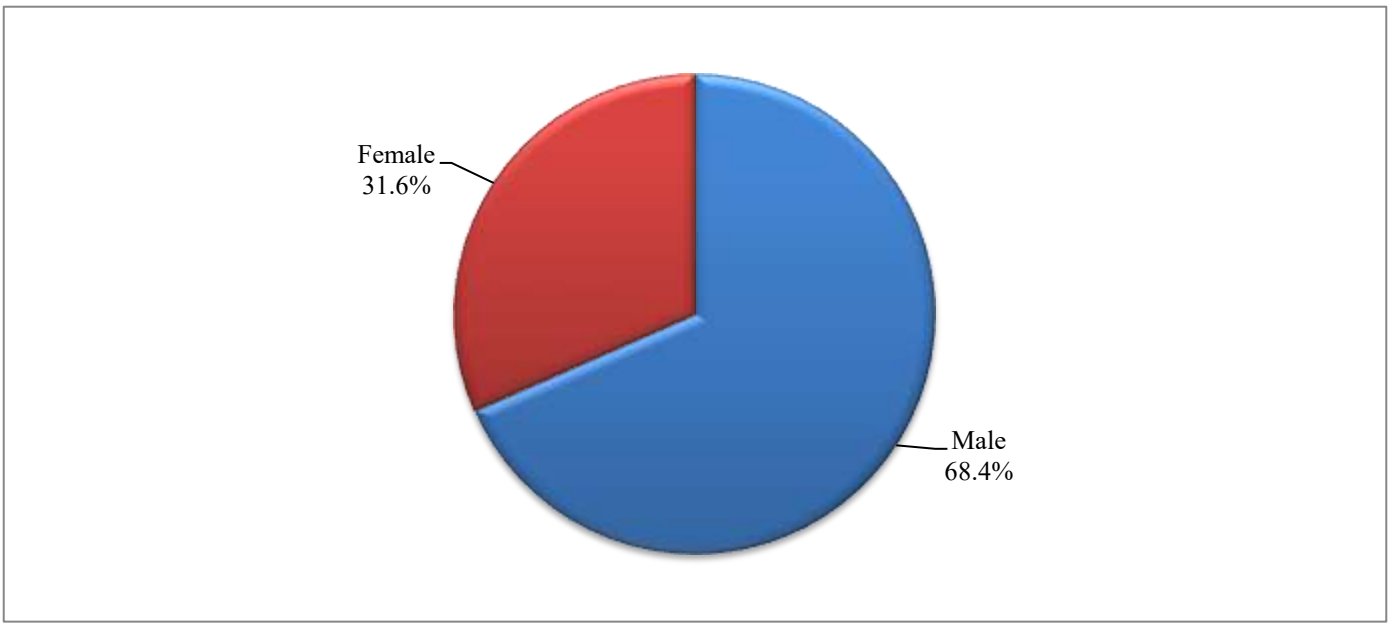

Figure 1
Gender of Respondents

When looking at the educational level of the respondents, the study findings revealed that 8.4% (8) percent of the respondents had primary education, 53.7% (51) percent of respondents had secondary education, 4.2% (4) percent of respondents had college education and 33.7% (32) percent of the respondents had university education as shown in

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Figure 2 below. So according to these findings the large number of respondents had secondary education. Due to the nature of port activities, it is not surprising to find the large number of workers having the secondary education.

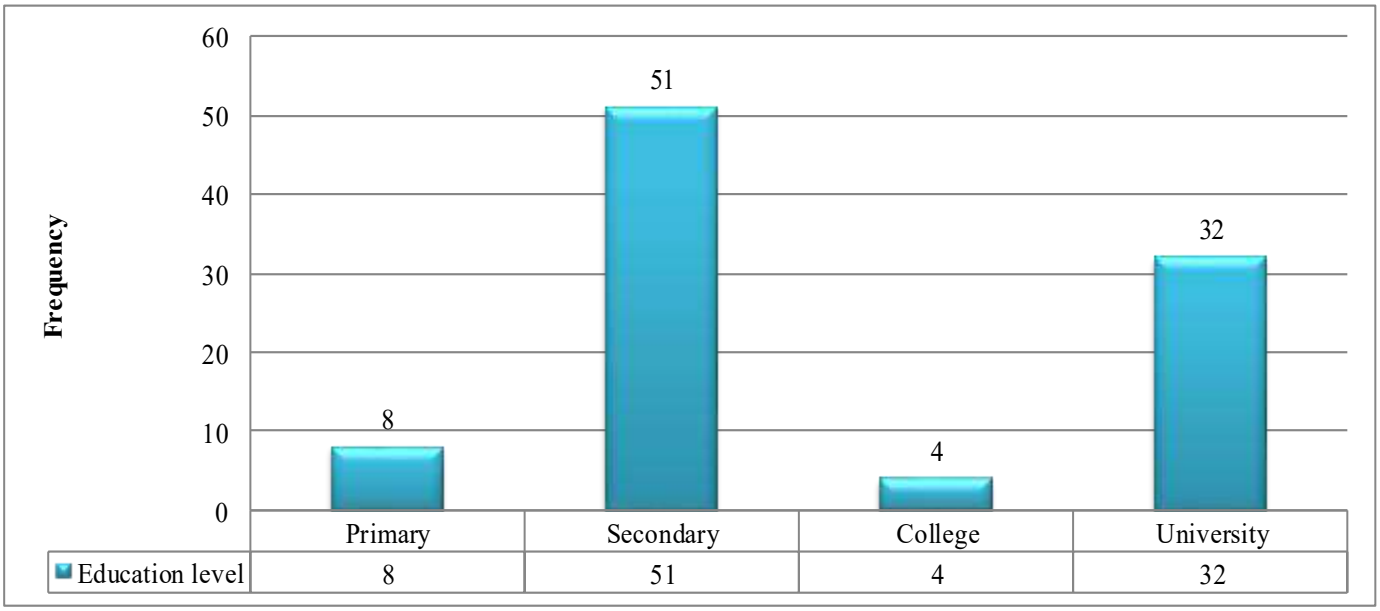

Figure 2
Education Level of Respondents

Researcher continued analyzing the marital status of respondents. Upon looking extensively on the marital status of respondents, researcher came to realize that 74.7 percent of the respondents were married, 14.7 percent of the respondents were single, and 6.3 percent of the respondents were divorced while 4.2 percent of the respondents were either widow as shown in figure 3. These findings have shown that the majority of the respondents were married. In fact, this is not surprising because these are professionals employed, they have already completed their professional studies and for that matter it is not surprising to find majority of them being married.

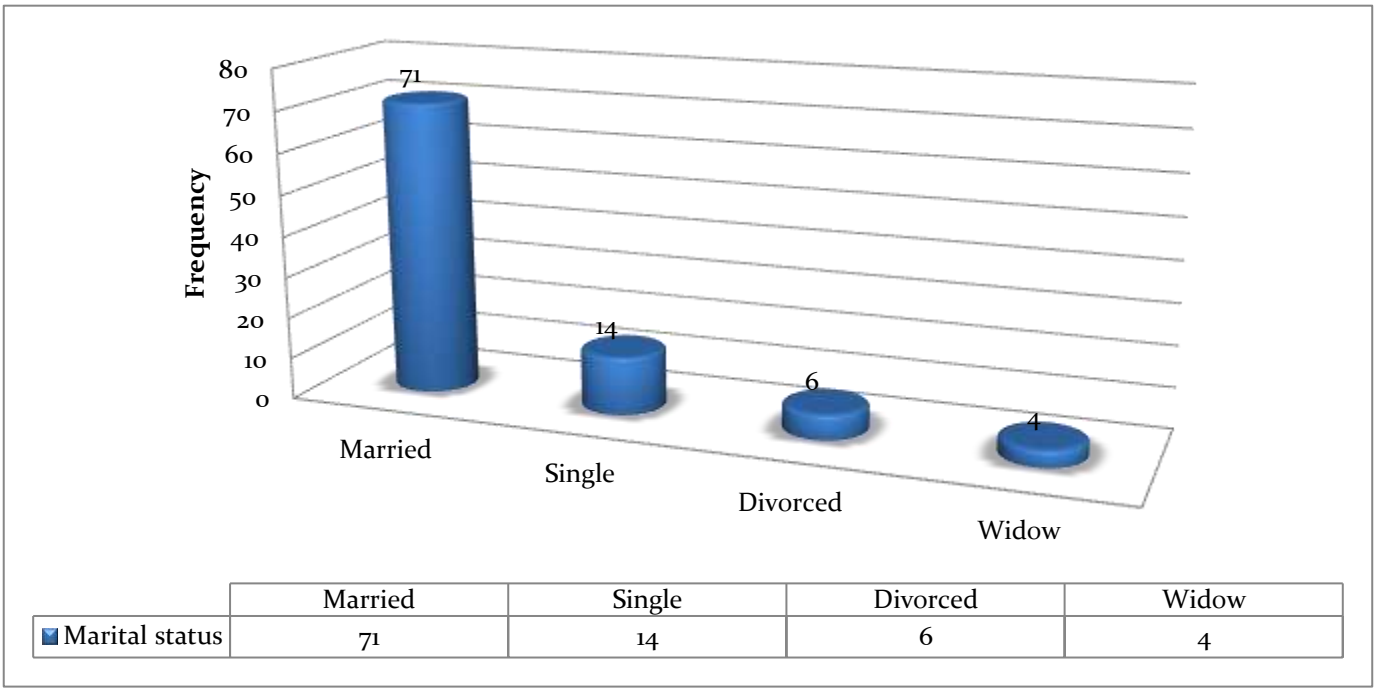

Figure 3
Marital Status of the Respondents

Understanding on the on the age of respondents as far as research is concerned is also very important. Researcher for that matter looking on how the respondents were distributed as far as their age is concerned. Findings from this

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analysis evidenced that 9.5 percent of the respondents were of the age between 18 to 25 years, 10.5 percent of the respondents were of the age between 26 to 35 years, 69.5 percent of the respondents were of the age between 36 to 45 years and 10.5 percent of the respondents were of the age between 46 to 60 years as shown in figure 4. These findings inform that the majority of the respondents were aged between 36 to 45 years. When looking at these age groups it is visible that the majority of the respondents were aged between 36 to 45 years. In this manner it obvious that the information was collected from the right people as far as age of the respondents is concerned.

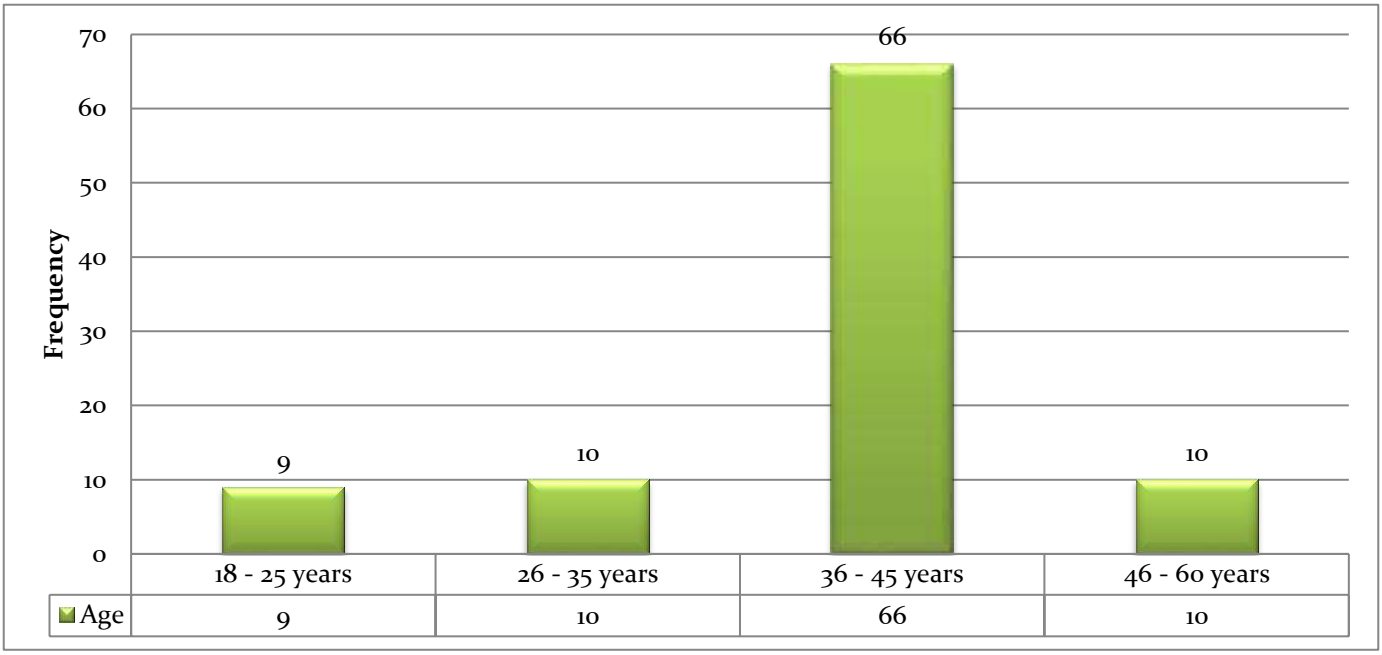

Figure 4
Age of the Respondents

The findings above in relation to gender, education level, marital status and age of the respondents have shown that respondents were distributed into various groups according to their gender, education level, their marital status as well as their age. In that matter we can be confident that the information collected was from right people as far as education level and age of the respondents is concerned.

4.1.2 The Extent to which IT Governance Practices are Aligned with Strategic Objectives at TPA

The first objective aimed to assess the extent to which IT governance practices are aligned with strategic objectives of TPA. In order to achieve this objective, researcher determined the following; first, researcher determined whether IT governance is linked to projects at TPA. Findings were as follows; 5.3 percent of respondents strongly agreed that IT governance is linked to projects at TPA, 70.5 percent of respondents agree, 9.5 percent of respondents were neutral, 8.4 percent of respondents disagreed, and 6.3 percent of respondents strongly disagreed (see Table 1). According to these findings, the majority of respondents agreed that IT governance is linked to projects at TPA.

Table 1
IT Governance is linked to Projects at TPA

Response	Frequency	Percent
Strongly agree	5	5.3
Agree	67	70.5
Neutral	9	9.5
Disagree	8	8.4
Strongly disagree	6	6.3
Total	**95**	**100.0**

Secondly, researcher determined whether TPA top management is involved in IT governance decision-making. Findings were as follows; 80.0 percent of respondents strongly agreed that TPA top management is involved in IT governance decision making, 10.5 percent of respondents agreed, and 9.5 percent of respondents were neutral (see Table 2). According to these findings, the majority of respondents agreed that TPA top management is involved in IT governance decision making.

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Table 2
TPA Top Management is involved in IT Governance Decision-Making

Response	Frequency	Percent
Strongly agree	76	80.0
Agree	10	10.5
Neutral	9	9.5
Total	**95**	**100.0**

Thirdly, researcher determined whether key performance indicators are used to measure the success of IT initiatives in achieving strategic goals. Findings were as follows; 5.3 percent of respondents strongly agreed that key performance indicators are used to measure the success of IT initiatives in achieving strategic goals, 87.4 percent of respondents agreed, and 7.4 percent of respondents were neutral (see Table 3). According to these findings, the majority of respondents agreed that key performance indicators are used to measure the success of IT initiatives in achieving strategic goals.

Table 3
Key Performance Indicators are used to Measure the Success of IT Initiatives in Achieving Strategic Goals

Response	Frequency	Percent
Strongly agree	5	5.3
Agree	83	87.4
Neutral	7	7.4
Total	**95**	**100.0**

Fourthly, researcher determined whether financial and human resources are allocated to IT projects based on their strategic importance. Findings were as follows; 5.3 percent of respondents strongly agreed that financial and human resources are allocated to IT projects based on their strategic importance, 11.6 percent of respondents agreed, 4.2 percent of respondents were neutral, and 78.9 percent of respondents disagreed (see Table 4). According to these findings, the majority of respondents disagreed on the fact that financial and human resources are allocated to IT projects based on their strategic importance.

Table 4
Financial and Human Resources are Allocated to IT Projects Based on their Strategic Importance

Response	Frequency	Percent
Strongly agree	5	5.3
Agree	11	11.6
Neutral	4	4.2
Disagree	75	78.9
Total	**95**	**100.0**

The interview with some of the respondents also revealed that IT governance practices are aligned to a great extent. This was as quoted below;

> *"…of course, TPA is doing a lot in aligning IT governance practices with strategic objectives. Here at TPA for example we are using key performance indicators in measuring the success of IT initiatives in achieving strategic goals…"*

The first objective as mentioned earlier assessed the extent to which IT governance practices are aligned with strategic objectives at TPA. In order to attain this objective researcher checked whether IT governance is linked to projects at TPA, whether TPA top management is involved in IT governance decision making, whether KPIs are used to measure the success of IT initiatives in achieving strategic goals, and whether financial and human resources are allocated to IT projects based on their strategic importance. Findings as showed above showed that IT governance is linked to projects; TPA top management is involved in IT governance decision making. Furthermore, KPIs are used to measure the success of IT initiatives in achieving strategic goals, however the study found that financial and human resources are not allocated to IT projects based on their strategic importance. Following the findings above we can state that IT governance practices are aligned with strategic objectives to a large extent although financial and human resources are not allocated to IT projects based on their strategic importance. The findings to this study are similar to those by Alotaibi et al. (2022) who studied IT governance alignment practices and the objectives of an organization. In their study objectives of the organization was the dependent variable while IT governance was the independent variable.

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In their study COBIT as one of the IT governance frameworks was adopted, and played role in showing the effectiveness the goals of an organization and the IT operations. Their findings indicated that better resource utilization, enhanced compliance with regulations, as well as more trust of stakeholders was engineered by adoption of IT governance frameworks in these organizations.

4.1.3 The Effectiveness of risk Management Mechanisms in IT Projects at TPA

The second objective aimed to evaluate the effectiveness of risk management mechanisms in IT projects of TPA. In order to achieve this objective, researcher determined the following; first, researcher determined whether there is adequacy and clarity of mitigation strategies for identified risks. Findings were as follows; 83.2 percent of respondents strongly agreed that there is adequacy and clarity of mitigation strategies for identified risks, 13.7 percent of respondents were neutral on this issue, while 3.2 percent of respondents disagreed on the adequacy and clarity of mitigation strategies for identified risks (see Table 5). According to these findings the majority strongly agreed on the adequacy and clarity of mitigation strategies for identified risks.

Table 5

There is Adequacy and Clarity of Mitigation Strategies for Identified Risks

Response	Frequency	Percent
Strongly agree	79	83.2
Neutral	13	13.7
Disagree	3	3.2
Total	**95**	**100.0**

Secondly, researcher wanted to know how TPA identifies risks during the planning and execution phase. Using the information obtained from open ended questionnaires, the study found that TPA identifies risk during both the planning and execution phases through a structured and proactive approach. In the planning phase, TPA conducts environmental and feasibility studies to assess potential environmental, social, and economic risks associated with port expansion and infrastructure projects. Additionally, stakeholder consultants with government agencies, logistics companies, and local communities help identify regulatory and operational risks. TPA also reviews historical data to analyse past challenges, such as delays, security issues, and financial mismanagement, allowing for better risk anticipation. Furthermore, regulatory and compliance assessments ensure that all projects align with national laws and international maritime standards, reducing the likelihood of legal complications.

During the execution phase, TPA continuously monitors risks using real-time monitoring systems to track cargo movement, security threats, and operational bottlenecks. Regular risk audits and inspections help detect emerging risks, such as infrastructure failures, theft, or cyber threats. Additionally, incident reporting mechanisms encourage staff and stakeholder to report operational disruptions, enabling quick response and mitigation. TPA also has crisis and contingency planning strategies in place to manage unexpected risks like natural disasters, labour strikes, or global supply chain disruptions. This is as quoted below from the open-ended questionnaire;

> *"…at TPA risks during planning and execution phase are identified using by carrying out environmental and feasibility studies, by consulting stakeholders, by reviewing historical data, by regulatory and compliance assessments, using real-time monitoring systems, by carrying regular risks audits and inspections, by using incident reporting mechanisms, but also using crisis and contingency planning strategies…"*

Thirdly, researcher wanted to know the methodologies used by TPA for risk analysis (whether qualitative or quantitative). Findings revealed that TPA employs both qualitative and quantitative methodologies for risk analysis to ensure a comprehensive assessment of potential threats. In qualitative risk analysis, TPA relies on expert judgment, historical data, and stakeholder input to assess risks based on their likelihood and impact. This includes risk identification, workshops, where experts, employees, and stakeholders collaborate to identify potential risks through brainstorming sessions. Additionally, TPA uses risk matrices and categorization to rank risks from low to high, allowing for better prioritization. Another key method is scenario analysis, where different risk scenarios, such as supply chain disruptions or security breaches, are evaluated to develop mitigation strategies. Strategic tools like SWOT (Strengths, Weaknesses, Opportunities, and Threats) and PESTEL (Political, Economic, Social, Technological, Environmental, and Legal) analysis further help in identifying external and internal risks that may impact port operations.

On the side TPA also uses quantitative risk analysis to measure risks using numerical values and statistical models. Probability and impact analysis allows TPA to calculate the likelihood of risks occurring and their potential financial or operational consequences. Advanced techniques like Morte Carlo simulation help TPA to predict different risk scenarios and their likelihood, particularly for financial and operational risks. Cost-benefit analysis also is employed by TPA to evaluate the feasibility of risk mitigation strategies by comparing the costs of prevention against potential

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losses. Furthermore, TPA uses Key Performance Indicators (KPIs) and data analytics are used to monitor port performance, security breaches, and cargo handling efficiency, enabling early detection of emerging risks. This was as quoted from the answers from one of the open-ended questionnaires;

> *"…at TPA we are using both qualitative and quantitative approaches for risk analysis. Some of the qualitative methods we use include, risk identification workshop, where experts, employees, and stakeholders cooperate together in identifying risks. Another qualitative approach used in risk matrices and categorization, scenario analysis as well as SWOT and PESTEL analysis. On the quantitative methods, TPA uses probability and impact analysis, Monte Carlo simulation, cost-benefit analysis as well as use of KPIs…"*

Fourthly, researcher wanted to know whether prioritization of risks aligns with projects objectives. Findings revealed that at TPA prioritization of risks aligns with project objectives. This is due to the fact that TPA ensures that risk prioritization aligns with its projects by using a structured approach that balances operational efficiency, financial sustainability, and regulatory compliance. TPA categorizes and addresses risks based on their potential impact on on-going and future projects. TPA ranks risks based on severity, likelihood, and project relevance. This was as quoted below from open-ended questionnaire responses;

> *"…yes, at TPA prioritization of risks aligns with project objectives. Lower-priority risks, such as minor procedural inefficiencies are managed through long-term improvement strategies. High-impact risks such as infrastructure failures, security threats, and regulatory non-compliance, receive immediate attention because they can significantly disrupt port operation…"*

The second objective of the study evaluated the effectiveness of risk management mechanisms in IT projects at TPA. In order to achieve this objective researcher determined whether there is adequacy and clarity of mitigation strategies for identified risks. The study also determined how TPA identifies risks during the planning and execution phase. The study also determined methodologies used by TPA for risks analysis, and finally researcher determined whether prioritization of risks aligns with projects objectives. Findings as stated above showed that there is adequacy and clarity of mitigation strategies for identified risks. The study also found that TPA identifies risks during the planning and execution phase by carrying out environmental and feasibility studies, by consulting stakeholders, by reviewing historical data, by regulatory and compliance assessments, using real-time monitoring systems, by carrying regular risks audits and inspections, by using incident reporting mechanisms, but also using crisis and contingency planning strategies. The study also found that TPA uses both qualitative and quantitative approaches for risks analysis, and lastly the study found that at TPA prioritization of risks aligns with projects objectives. Following those findings above, we can state that risk management mechanism in IT projects at TPA are effective. The finding to this study are similar to those by Kerzner (2020) studied the causes of projects which fail and looked at the reasons on the failure of those projects. A total of 4,600 IT projects were surveyed throughout the globe. The study found that one of the reasons for the failure was exceeding their budgets (18 percentage). Furthermore, other reasons for the failure of objectives included lack of clear objectives, non-involvement of top management, but also lack of sufficient execution and control. All the above-mentioned reasons were found to be the major reasons for the failure of different IT projects globally.

4.1.4 Challenges Facing TPA in Implementing IT Governance Frameworks

The third objective aimed to identify challenges facing TPA in implementing IT governance frameworks. In order to achieve this objective, researcher determined the following; first, researcher determined whether organizational silos are one of the challenges facing TPA in implementing IT governance framework. Findings were as follows; 86.3 percent of respondents strongly agreed that organizational silos are one of the challenges facing TPA in implementing IT governance framework, 8.4 percent of respondent agreed, and 5.3 percent of respondents were neutral (see Table 6). According to the findings by the majority organizational silos are one of the challenges facing TPA in implementing IT governance framework.

Table 6

Organizational Silos is one of the Challenges Facing TPA in Implementing IT Governance Frameworks

Response	Frequency	Percent
Strongly agree	82	86.3
Agree	8	8.4
Neutral	5	5.3
Total	**95**	**100.0**

Secondly, researcher determined whether risk-averse culture is one of the challenges facing TPA in implementing IT governance framework. Findings were as follows; 80.0 percent of respondents strongly agreed that risk-averse culture is one of the challenges facing TPA in implementing IT governance framework, 4.2 percent of

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respondent agreed, and 15.8 percent of respondents were neutral (see Table 7). According to the findings by the majority risk-averse culture is one of the challenges facing TPA in implementing IT governance framework.

Table 7
Risk-averse culture is one of challenges facing TPA in implementing IT governance frameworks

Response	Frequency	Percent
Strongly agree	76	80.0
Agree	4	4.2
Neutral	15	15.8
Total	**95**	**100.0**

Thirdly, researcher determined whether insufficient funding is one of challenges facing TPA in implementing IT governance frameworks. Findings were as follows; 86.3 percent of respondents strongly agreed that insufficient funding is one of the challenges facing TPA in implementing IT governance framework, 7.4 percent of respondent agreed, and 6.3 percent of respondents were neutral (see Table 8). According to the findings by the majority insufficient funding is one of the challenges facing TPA in implementing IT governance framework.

Table 8
Insufficient Funding is one of Challenges Facing TPA in Implementing IT Governance Frameworks

Response	Frequency	Percent
Strongly agree	82	86.3
Agree	7	7.4
Neutral	6	6.3
Total	**95**	**100.0**

Fourthly, researcher determined whether digital skills gap is one of challenges facing TPA in implementing IT governance frameworks. Findings were as follows; 8.4 percent of respondents strongly agreed that digital skills gap is one of the challenges facing TPA in implementing IT governance framework, 68.4 percent of respondent agreed, and 23.2 percent of respondents were neutral (see Table 9). According to the findings by the majority digital skills gap is one of the challenges facing TPA in implementing IT governance framework.

Table 9
Digital Skills Gap is one of Challenges Facing TPA in Implementing IT Governance Frameworks

Response	Frequency	Percent
Strongly agree	8	8.4
Agree	65	68.4
Neutral	22	23.2
Total	**95**	**100.0**

The interview with some respondents also pointed out that organizational silos, risk-averse culture, insufficient funding, and digital skills gap are some of the challenges facing maritime industry in implementing IT governance frameworks. This was as quoted below;

> *"… in fact, in any organization there are challenges, we are doing our level best but yet challenges like organizational silos, risk-averse culture, insufficient funding, and digital skills gap are some of the few challenges encountering TPA to date…"*

The third objective determined challenges facing TPA in implementing IT governance frameworks. In order to achieve this objective researcher determined whether organizational silos, risk-averse culture, insufficient funding, and digital skills gap are challenges facing TPA in implementing IT governance frameworks. The study found that organizational silos, risk-averse culture, insufficient funding, and digital skills gap are some of the challenges facing TPA in implementing IT governance frameworks. The findings to this study are similar to finding by Sharma et al. (2019) pointed out that one of the challenges facing public agencies in implementing IT governance frameworks is risk-averse culture. The study further details that resistance to change do affect organizations when in need to adopt new IT technologies in project management. In organizations there are people who are not ready for change; they always rely on the traditional methods of doing things. To such people when a new technology comes, they are not easily ready to adopt it, and as a result delaying the progress of the organization. Furthermore, the study also found that budget inefficiency also does affect the implementation of IT governance frameworks. Lack of sufficient budget allocated in IT governance frameworks to limit project management initiatives.

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4.2 Inferential Statistics

The multiple linear regression equation was used in this study to determine the relationship between successful project management which was the dependent and the IT governance alignment, risk management mechanisms, and challenges facing TPA which were the independent variables.

$$SP = \beta_0 + \beta_1 IG + \beta_2 RM + \beta_3 CT + \varepsilon_0 \ldots\ldots\ldots \text{(i)}$$

Where:

$SP = Successful\ project\ management$
$IG = IT\ governance\ alignment$
$RM = Risk\ management\ mechanisms$
$CT = Challenges\ facing\ TPA$
$\beta_0 = Constant$
$\beta_i = Coefficient\ of\ variables$
$\varepsilon_0 = Error\ term$

4.2.1 Correlation between the Variables

Researcher also carried out a correlation analysis between the variables. The correlations' coefficients in table 10 revealed that IT governance alignment is positively associated with successful project management ($r = 0.5438$, $p < 0.05$). This finding agrees with a study by Alotaibi et al. (2022) who also found a positive relationship between IT governance alignment and successful project management. The correlations coefficients in table 4.10 revealed that risk management mechanisms is positively associated with successful project management ($r = 0.4355$, $p < 0.04$). This finding is supported by a study by Nwachukwu & Asongu (2019) who also found a positive relationship between risk management mechanisms and the successful project management.

The correlations coefficients in table 10 revealed that challenges facing TPA is negatively associated with successful project management ($r = -0.8349$, $p < 0.00$). This finding is supported by a study by Tan et al. (2019) who also found a negative relationship between challenges facing port authorities and successful project management.

Table 10

Correlations between Variables

	Successful project management	IT governance alignment	Risk management mechanisms	Challenges facing TPA
Successful project management	1.0000			
IT governance alignment	0.5438	1.0000		
Risk management mechanisms	0.4355	0.7899	1.0000	
Challenges facing TPA	-0.8349	-0.5382	-0.4532	1.0000

4.2.2 Regression Results

The study carried out linear regression based on Ordinary Least Squares (OLS) in order to determine how successful project management as the dependent variable was related to IT governance alignment, risk management mechanisms, and challenges facing TPA, which were the independent variables. After running the linear regression (ordinary least squares) the variables were tested for multicollinearity. The mean Variance Inflation Factor (VIF) was found to be 2.42 (see Table 11a). If mean VIF is greater than 10 there is a problem of multicollinearity. In this case the variables in this regression had no problem of multicollinearity.

The coefficient for IT governance alignment was found to be 0.1973 (See Table 11). This coefficient was statistically significant at 1 percent level of significance. Meaning that for a unit increase in IT governance alignment there was 0.1973 units increase in successful project management. That is to say, more IT governance alignment increases successful project management. On other hand the study has found that for IT governance alignment resulted into successful project management at TPA. These findings are similar to those by Techtarget (2023). They also found a positive relationship between IT governance alignment and the successful project management.

The coefficient for risk management mechanisms was found to be 0.0282 (See Table 11). This coefficient was statistically significant at 5 percent level of significance. Meaning that for a unit increase in the effectiveness of risk management mechanisms there was 0.0282 units increase in successful project management. That is to say, more effective risk management mechanisms increase successful project management. On other hand the study has found that for effective risk management mechanisms resulted into successful project management at TPA. These findings are similar to those by Sharma et al. (2019). They also found a positive relationship between IT governance alignment and the successful project management.

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The coefficient for challenges facing TPA was found to be -0.7304 (See Table 11). This coefficient was statistically significant at 10 percent level of significance. Meaning that for a unit increase in challenges facing TPA there was -0.7304 units decrease in successful project management. That is to say, more challenges facing TPA decreases successful project management. On other hand the study has found that in order to realize success in project management, challenges facing TPA should be reduced if not eliminated. These findings are similar to those by Techtarget (2023). They also found a negative relationship between challenges facing TPA and the successful project management.

Table 11

Linear Regression Results

Dependent variable: Successful project management			
Variable	Coeff	Std. error	Sig
IT governance alignment	0.1973***	0.1169	0.000
Risk management mech	0.0282**	0.1452	0.046
Challenges facing TPA	-0.7304*	0.0664	0.095
Constant	0.0670	0.2626	0.799
Number of Obs. = 95	Prob> F = 0.0000	R^2 = 0.8131	Adj. R^2 = 0.7993

Legend: * = P < 0.1, ** = P < 0.05, *** = P < 0.01

Table 11*a*

Multicolinearity Test

Variable	VIF	Tolerance
IT governance alignment	3.00	0.333120
Risk management mech	2.83	0.352873
Challenges facing TPA	1.42	0.704353
Mean VIF	2.42	

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The findings indicate that while IT governance practices at the Tanzania Ports Authority are aligned with strategic objectives, there is a disconnection between strategic importance and the allocation of financial and human resources for IT projects. This misalignment can hinder the successful implementation of critical IT initiatives, leading to inefficiencies, delays, and missed opportunities for technological advancement. Without proper resource allocation, even well-governed IT projects may fail to deliver the intended benefits, ultimately impacting the overall effectiveness of port operations and strategic growth.

The finding that risk management mechanisms in IT projects at TPA are effective suggests that TPA has established robust processes to identify, assess, and mitigate risks in its IT initiatives. This indicates a proactive approach to managing potential threats, ensuring that IT projects remain secure, efficient, and aligned with organizational objectives. However, while effectiveness is acknowledged, continuous improvement is necessary to adapt to evolving IT risks, such as cyber security threats, technological failures, and project delays. Maintaining this effectiveness requires ongoing evaluation, investment, and strategic adjustments.

The finding highlights significant challenges that hinder the effective implementation of IT governance frameworks at the TPA. Organizational silos limit collaboration and information sharing, leading to inefficiencies in IT governance. A risk-averse culture slows down digital transformation as employees and leadership may resist adopting new technologies. Additionally, insufficient funding restricts the implementation of necessary IT projects, while the digital skills gap prevents employees from effectively utilizing and managing IT systems. These challenges collectively weaken IT governance, reducing TPA's ability to fully leverage technology for operational efficiency and strategic growth.

5.2 Recommendations

It is recommended that TPA should adopt a structured approach to allocate financial and human resources based on the strategic value of IT projects. This can be achieved by implementing a prioritization model that evaluates projects based on their contribution to efficiency, security, and long-term sustainability. It is also recommended that a dedicated IT budgeting process should be established to ensure that high-priority IT projects receive adequate funding. It is also recommended that TPA should invest in IT skills development programs, including staff training, recruitment of specialized personnel, and collaboration with external IT experts.

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It is recommended that TPA should strengthen its cyber security framework by implementing advanced security protocols, regular vulnerability assessments, and employee cyber security awareness programs to address emerging threats. It is also recommended that TPA should establish a continuous monitoring and improvement cycle to ensure that risk management strategies evolve alongside technological advancements and industry best practices. It is also recommended that TPA should ensure strict adherence to national and international IT governance standards for information security and regularly review compliance policies. It is also recommended that TPA should enhance its disaster recovery and business continuity plans to ensure rapid response and minimal disruption in case of IT-related failures or security breaches.

It is recommended that TPA should promote cross-departmental collaboration by implementing integrated IT governance structures, encouraging knowledge sharing, and using digital platforms for seamless communication. It is also recommended that TPA should foster an innovation-driven mindset through leadership support, digital transformation awareness programs, and change management strategies that highlight the benefits of IT governance. It is also recommended that TPA should advocate for increased budget allocations for IT projects by demonstrating their strategic value. It is also recommended that TPA should refine its IT governance policies, align them with international best practices and establish accountability mechanisms to ensure proper implementation and monitoring.

REFERENCES

Aljitri, H. A., Pons, A., & Collins, D. (2023). Global e-commerce: A framework for understanding and overcoming the trust barrier. *Information Management, 11*(3), 130–138.

Alotaibi, F., Aldossary, S., & Al-Mutairi, A. (2022). Effectiveness of IT governance in public sector projects: Evidence from developing economies. *International Journal of IT Management, 14*(3), 189–203.

De Haes, S., & Grembergen, W. (2020). *IT governance and its impact on project success in organizations*. Springer Publishing.

Highsmith, J. (2020). *Agile project management: Creating innovative products*. Addison-Wesley Professional.

Huang, X., Wang, J., & Liu, Z. (2023). Challenges of IT governance in public institutions: A case analysis. *Journal of Public Administration and Technology, 29*(2), 104–117.

Kerzner, H. (2020). *Project management: A systems approach to planning, scheduling, and controlling*. Wiley.

Musomba, S., & Njau, P. (2023). Integrating IT governance into project management in East Africa: A case of Tanzania Ports Authority. *African Journal of Management Studies, 18*(1), 56–72.

Nwachukwu, J. C., & Asongu, S. A. (2019). The role of openness in the effect of ICT on governance. *IT Development*, 503–531.

Project Management Institute (PMI). (2021). *A guide to the project management body of knowledge*. Project Management Institute.

Sharma, D., Stone, M., & Ekinci, Y. (2019). IT governance and project management: A qualitative study. *Database Marketing & Customer Strategy Management, 16*(1), 29–50.

Tan, K. S., Chong, S. C., Lin, B., & Eze, U. C. (2019). Internet-based ICT adoption: Evidence from Malaysian SMEs. *Industrial Management & Data Systems, 109*(2), 224–244.

Techtarget. (2023). *Technological complexities in IT governance for public organizations*. Techtarget.

Weill, P., & Ross, J. W. (2021). *IT governance: How top performers manage IT decision rights for superior results*. Harvard Business Review Press.

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The role of digital platforms in amplifying silenced voices

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ABSTRACT

The paper examines the role of digital platforms in amplifying the voices of marginalized Muslim women, as presented in Sherine Hafez's (2018) biographical memoir, Women of the Midan, as a central case study. The aim is to analyse how digital platforms facilitated the articulation of political aspirations, challenge patriarchal structures and construct alternative narratives of selfhood and agency among Egyptian Muslim women during the Egyptian revolution. The paper analyses how platforms like Facebook, Twitter, and blogs enabled Muslim women activists to bypass state-controlled media. It also documents human rights abuses and share personal experiences of these women with a global audience. This highlights the complexities and limitations of digital activism in this context and assesses the overall impact of digital platforms in empowering Muslim women in Egypt to reclaim their voices, assert their agency and contribute to broader social and political change. This study adopts a qualitative interpretive approach, drawing on critical discourse analysis (CDA) and feminist media studies and entails close reading and textual analysis of Hafez's (2018) biographical memoir. Ultimately, the paper argues that digital platforms, despite their inherent risks and limitations, provides a crucial space for these women, offering valuable lessons for understanding the evolving dynamics of gender, religion, and digital activism in contemporary society.

Keywords: Biographical Memoirs, Digital Platforms, Egyptian Revolution, Muslim Women

I. INTRODUCTION

The intersection of digital platforms, gender, and political activism has become a crucial area of inquiry in understanding contemporary social movements (Castells, 2012). In particular, the role of these platforms in amplifying marginalized voices, especially those of Muslim women, warrants critical examination. Existing scholarship has demonstrated how digital spaces can serve as powerful tools for challenging dominant narratives and patriarchal structures (Baym, 2015; Couldry & McCarthy, 2007). However, the specific nuances of how these platforms empower Muslim women in contexts of political upheaval and societal change, while simultaneously navigating inherent risks and limitations, requires further exploration. This paper addresses this gap by examining Sherine Hafez's (2018) biographical memoir, *Women of the Midan*, as a compelling case study.

Hafez's (2019) biographical memoir provides a rich account of the experiences of Egyptian Muslim women activists during the Egyptian revolution, offering unique insights into how digital technologies facilitated their political participation and self-representation. As argued by Moghadam (2002), women's participation in social movements often challenges traditional gender roles and contributes to the re-negotiation of power dynamics within society. We argue that platforms like Facebook, Twitter, and blogs enabled women activists to bypass state-controlled media, organize protests, document human rights abuses, and share their personal stories with a global audience, ultimately contributing to broader social and political change.

While acknowledging the potential for surveillance and online harassment (Keller, 2017), this paper will explore the complexities and limitations of digital activism in this context, paying particular attention to how these women constructed alternative narratives of selfhood and agency through their online presence. By analysing Hafez's (2019) biographical memoir, this study will contribute to a deeper understanding of the evolving dynamics of gender, religion, and digital activism in contemporary society, and critically assess the overall impact of digital platforms in empowering Muslim women in Egypt to reclaim their voices and assert their agency. To achieve this aim, we will employ a qualitative research approach methodology, which entails close reading and textual analysis of Hafez's (2018) biographical memoir.

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1.1 Research Objective

The objective of this study is to examine how digital platforms facilitated the articulation of political aspirations, challenged patriarchal structures, and enabled the construction of alternative narratives of selfhood and agency among marginalized Egyptian Muslim women during the Egyptian revolution, as depicted in Sherine Hafez's (2018) *Women of the Midan*.

II. METHODOLOGY

This study employs a qualitative interpretive design, drawing on critical discourse analysis (CDA) and feminist media studies to examine Sherine Hafez's (2018) *Women of the Midan*. Rather than treating the memoir only as a literary text, the research positions it as a cultural and political artifact that documents how digital platforms became spaces for amplifying marginalized Muslim women's voices, challenging entrenched patriarchal structures, and shaping alternative narratives of selfhood and agency during the Egyptian Revolution. By critically engaging with the biographical accounts, the study aims to uncover the complexities and impact of digital activism in enabling these women to bypass traditional media, organize protests, document abuses, and share their stories with a global audience.

III. FINDINGS & DISCUSSION

3.1 Digital Platforms as Catalysts for Muslim Women's Voices

The Egyptian Revolution of 2011 witnessed a seismic shift in the landscape of political participation, particularly for marginalized groups. Central to this transformation was the unprecedented role of digital platforms. Facebook, Twitter, blogs, and other online spaces became vital tools, empowering Egyptian Muslim women activists to circumvent the heavily controlled state media, organize protests, document human rights abuses, and share their personal stories with a global audience. This section examines how these platforms facilitated the articulation of political aspirations and the construction of alternative narratives of selfhood and agency among Egyptian Muslim women, drawing heavily on the insights and experiences detailed in Sherine Hafez's (2018) *Women of the Midan*.

For decades, the Egyptian media landscape had been dominated by the state, serving as a mouthpiece for the ruling regime. This left little room for dissenting voices, particularly those of Muslim women and marginalized communities. Digital platforms offered a crucial alternative. Hafez (2018) vividly illustrates this:

> "*Before the revolution, we felt invisible. The state only showed us the women they wanted us to be: quiet, obedient, and supportive of the regime. But on Facebook, we could finally show ourselves for who we really were: activists, thinkers, and agents of change"* (p. 72).

This experience aligns with what scholars have observed about the democratizing potential of the internet in authoritarian contexts. Castells (2012) argues that networked social movements thrive when they can bypass traditional media channels and create their own spaces for communication and mobilization. In the Egyptian context, this meant that women could report on protests, share eyewitness accounts of police brutality, and disseminate information that was being actively suppressed by state-controlled media. The rise of citizen journalism, facilitated by smartphones and social media, provided a real-time, unfiltered picture of the revolution.

Moreover, digital platforms allowed for the dissemination of alternative Islamic discourses. Rahman (2014) notes that Islamic feminism, which seeks to reinterpret Islamic texts and traditions through a gender-egalitarian lens, found a fertile ground online. Women activists could use platforms to challenge patriarchal interpretations of Islam and assert their right to participate fully in public life. This is reflected in *Women of the Midan*:

> *"We used to be told that Islam forbade us from protesting, from speaking out. But we found other voices online, other women who showed us that our faith could be empowering, not limiting*" (Hafez, 2018, p. 102).

One can see how Egyptian Muslim women were able to reclaim their agency and challenge patriarchal structures that had long dominated the social and political spheres by circulating their interpretations of Islam that are in congruent with their aspirations for equality and liberation.

Beyond simply disseminating information, digital platforms also proved essential for organizing protests and mobilizing activists. Facebook groups became hubs for coordinating demonstrations, sharing security information, and providing mutual support. Twitter served as a rapid communication tool, allowing activists to alert others to police activity, call for reinforcements, and amplify their messages to a wider audience. Hafez (2018) highlights the role of Facebook in the initial stages of the revolution:

> "*We used Facebook to announce the date of the first major protest. We created an event, invited our friends, and asked them to invite their friends. We were amazed by how quickly it spread. It was like a wildfire"* (p. 201).

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This reflects the power of weak ties in social networks, as described by Granovetter (1973). While strong ties within close-knit social groups are important for emotional support, weak ties – connections to more distant acquaintances – are crucial for disseminating information and mobilizing large numbers of people. Digital platforms facilitated the formation and maintenance of these weak ties, allowing activists to reach beyond their immediate social circles and build a broader movement. Furthermore, the anonymity offered by some online platforms allowed women to participate in activism while mitigating the risk of reprisal. This was particularly important in a context where women faced social stigma and potential violence for engaging in political activity. Hafez (2018) observes,

> *"Many women used pseudonyms for fear of their families finding out because such acts were frowned upon in the society. It allowed us to share information without fear of being identified"* (p. 212).

The Egyptian revolution was marked by widespread human rights abuses, including arbitrary arrests, torture, and extrajudicial killings. Digital platforms provided a crucial means of documenting these abuses and bringing them to the attention of the international community. Activists used smartphones to record videos of police brutality, document the injuries of protesters, and collect evidence of the regime's repression.

> *"We knew that if we didn't document what was happening, no one would believe us,"* Hafez (2018) writes. *"The state was trying to control the narrative, to portray the protesters as criminals and terrorists. But we had the videos, the photos, the testimonies to prove them wrong*" (p. 77).

These digital records served as powerful counter-narratives to the state's propaganda. They were shared on social media, uploaded to YouTube, and disseminated to international human rights organizations, helping to galvanize international support for the revolution. This corroborates findings by Diamond (2010) who asserts that digital media can serve as an accountability mechanism holding governments responsible for their actions. Further, digital platforms was their ability to allow Egyptian Muslim women to share their personal stories and construct alternative narratives of selfhood and agency. Blogs, Facebook pages, and Twitter accounts became spaces for women to express their hopes, fears, and aspirations for a more just and equitable society. Hafez (2018) emphasizes the importance of storytelling in the revolution:

> *"We needed to tell our stories, to show the world that we were not just victims, but active participants in the struggle for freedom. We wanted to show that Muslim women hold political aspirations just like everybody else"* (p.66).

These personal narratives challenged the dominant stereotypes of Muslim women as passive and oppressed. They revealed the diversity of experiences and perspectives within the Egyptian female population and demonstrated the critical role that women played in the revolution. Islamic feminism provides a theoretical framework for understanding this process of narrative construction. By reclaiming their voices and sharing their stories, Muslim women were not only challenging patriarchal structures but also reinterpreting their religious identities on their own terms. They were demonstrating that it is possible to be both a devout Muslim and a committed feminist, and that faith can be a source of empowerment, not oppression. They are constructing agency for themselves.

3.2 Limitations of Digital Activism

While digital platforms undeniably played a significant role in amplifying the voices of marginalized Muslim women during the Egyptian Revolution, as exemplified by the experiences recounted in Sherine Hafez's (2018) *Women of the Midan*, it is crucial to acknowledge the inherent limitations and challenges associated with digital activism in this context. This chapter critically examines these limitations, moving beyond celebratory narratives of empowerment to explore the darker sides of digital engagement, including issues of surveillance, online harassment, digital divides, and the potential for co-optation of digital activism by state actors and counter-revolutionary forces.

One of the most significant limitations of digital activism, particularly in contexts like Egypt, is the specter of state surveillance and censorship. The initial anonymity and perceived safety offered by platforms like Facebook and Twitter were quickly eroded as the Egyptian government, under Mubarak and later regimes, ramped up its digital surveillance capabilities. Hafez (2018) highlights this vulnerability through the experiences of the women she profiles. While they initially found refuge and a platform for expression online, the risk of identification and subsequent repercussions loomed large. As Deibert and Rohozinski (2012) argue, digital environments are not inherently free or democratic. Authoritarian states have become increasingly adept at monitoring online activity, identifying dissidents, and employing sophisticated techniques to suppress dissent. This chilling effect is subtly evident in *Women of the Midan*. While women openly shared their views, a constant undercurrent of fear and self-censorship existed. For example,

> *"... One woman mentioned that she had to be careful of what she posted lest her family would get into trouble with the authorities*" (p. 69).

This quote underscores the reality that even in digital spaces, activism could have real-world consequences. Furthermore, digital spaces, while providing a platform for marginalized voices, often replicate and amplify existing patriarchal structures and social inequalities. Online harassment and abuse, a pervasive issue globally, disproportionately target women, particularly those who are vocal about political and social issues. Hafez (2018) implicitly touches on this

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issue by documenting the online backlash and smear campaigns faced by some of the women activists. The anonymity afforded by the internet can embolden perpetrators of harassment, creating a hostile environment that silences and discourages women from participating in digital activism. As Jane (2016) claims, online misogyny is a potent tool for silencing women's voices and reinforcing patriarchal power dynamics.

> "*You wouldn't believe some of the things that people said about me online. It was nasty and personal and just tried to shut me up,"* (p.79).

This quote illustrates the emotional toll that online harassment can take and how it can effectively undermine women's participation in digital activism. Another critical limitation is the digital divide, which refers to the unequal access to digital technologies and the internet based on factors such as socioeconomic status, geographic location, and education. While *Women of the Midan* celebrates the digital empowerment of some Egyptian women, it is important to remember that access to the internet and digital literacy were not universally available. Those without access were effectively excluded from participating in online activism and having their voices heard. As Van Dijk (2006) argues, the digital divide is not simply about access to technology but also about the skills and knowledge required to effectively use it.

> "*Not everyone had a smartphone or even a reliable internet connection. We had to find ways to share information with people offline too*," (p. 106).

This highlights the importance of offline organizing and the need to bridge the digital divide to ensure that all voices are heard. Moreover, the initial fervor and optimism surrounding digital activism during the Arab Spring have been tempered by the recognition that digital platforms can be co-opted by state actors and counter-revolutionary forces to spread disinformation, manipulate public opinion, and undermine democratic movements. Fake news, propaganda, and online trolling can be used to discredit activists, sow discord, and create a climate of fear and uncertainty. Hafez (2018) doesn't explicitly address this phenomenon, but it is important to consider how the digital landscape in Egypt was increasingly polluted by such tactics after the initial stages of the revolution. As Morozov (2011) suggests, the internet is not inherently democratic; it can be used to strengthen authoritarian regimes as well as to challenge them.

Finally, the focus on digital activism can sometimes overshadow the importance of offline organizing and grassroots mobilization. While digital platforms can facilitate communication and coordination, they cannot replace the need for face-to-face interactions, community building, and sustained political engagement. The women in *Women of the Midan* actively participated in both online and offline activism, recognizing that both were essential for achieving meaningful change.

> "*We used Facebook to organize protests, but we also had to go out into the streets and talk to people. The internet was just one tool,"* (p. 127).

While digital platforms undoubtedly provided valuable spaces for marginalized Muslim women in Egypt to articulate their political aspirations, challenge patriarchal structures, and construct alternative narratives of selfhood and agency, it is crucial to acknowledge the limitations and challenges associated with digital activism in this context.

IV. CONCLUSIONS

This analysis of Sherine Hafez's *Women of the Midan* demonstrates the significant, albeit complex, role of digital platforms in empowering marginalized Muslim women during the Egyptian Revolution. While acknowledging the inherent limitations and risks of online activism, the study reveals how platforms like Facebook and Twitter provided crucial spaces for these women to circumvent state-controlled narratives, organize protests, document injustices, and articulate their political aspirations. Through sharing personal stories and challenging patriarchal structures online, these women constructed alternative narratives of selfhood and agency, contributing to broader social and political change. Ultimately, the experiences documented in Hafez's memoir underscore the transformative potential of digital platforms in amplifying the voices of marginalized groups and offer valuable insights into the evolving intersection of gender, religion, and digital activism in the contemporary world.

V. RECOMMENDATIONS

The findings from this study underscore several key recommendations. Firstly, advocacy groups and marginalized communities should strategically continue to harness digital platforms for voice amplification, counter-narrative construction, and mobilization, while remaining acutely aware of potential risks like surveillance and censorship. Secondly, policymakers and digital platform providers are encouraged to prioritize the creation and protection of safe, accessible digital spaces that empower marginalized voices, implementing measures to mitigate online harassment and state control. Finally, future research should expand on the evolving dynamics of gender, religion, and digital activism across diverse contexts, investigating the long-term impacts, nuanced challenges, and sustainable strategies for digital empowerment.

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Declaration of Conflict of Interest

The authors attest that they have no conflicting interests that could influence the quality of the work reported in this study.

REFERENCES

Baym, N. K. (2015). *Personal connections in the digital age* (2nd ed.). Polity Press.

Castells, M. (2012). *Networks of outrage and hope: Social movements in the Internet age*. Polity Press.

Couldry, N., & McCarthy, A. (Eds.). (2007). *MediaSpace: Place, scale and culture in a media age*. Routledge.

Deibert, R. J., Rohozinski, R., & Crete-Nishihata, M. (2012). Cyclones in cyberspace: Information shaping and denial in the 2008 Russia–Georgia war. *Security Dialogue, 43*(1), 3–24.

Diamond, L. (2010). *The spirit of democracy: The struggle to build free societies throughout the world*. Times Books.

Granovetter, M. S. (1973). The strength of weak ties. *American Journal of Sociology, 78*(6), 1360–1380. https://doi.org/10.1086/225469

Hafez, S. (2018). *Women of the Midan: Executing the Egyptian revolution*. Indiana University Press.

Jane, E. A. (2016). *Misogyny online: A short (and brutish) history* (SAGE Swifts). SAGE.

Moghadam, V. M. (2002). Islamic feminism and its discontents: Toward a resolution of the debate. *Signs: Journal of Women in Culture and Society, 27*(4), 1135–1171. https://doi.org/10.1086/339639

Rahman, T. (2014). *Islamic feminism in India: Between activism and scholarship*. Palgrave Macmillan.

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Effect of tax revenue growth on economic growth in Rwanda period of 2003 to 2023

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ABSTRACT

Economic growth is anticipated to be stimulated by higher tax revenues, which will fund social services, infrastructure, and economic diversification. But even though tax revenue has increased significantly during the past 20 years, Rwanda's economic growth has stagnated. In order to determine how tax income growth affected Rwanda's economic growth between 2003 and 2023, this study was conducted. In particular, from 2003 to 2023, the study looked at Rwanda's tax revenue trends and the connection between tax revenue increase and economic expansion. Null hypotheses were rejected during the assessment. The study used software (E-Views 10) for econometric analysis using time series data from Rwanda Revenue Authority and National Institute of Statistics of Rwanda reports. The study employed the Multiple Linear Regression Model and the Ordinary Least Squares (OLS) method to evaluate the long-term effects of various tax components on GDP by estimating the impact of independent variables on the dependent variable and determining the direction and strength of these relationships. The empirical findings revealed a statistically significant positive relationship between total tax revenue and economic growth in the long run, with customs duties (coefficient 31.56118) and PAYE (23.63706) contributing more strongly to GDP than other tax revenues (coefficient -13.22934), which has a significant decrease in GDP. It is observed that R-squared is 0.908230, showing that 91% of the variations in the growth of GDP in Rwanda are explained by independent variables (profit taxes, excise tax, customs duties, PAYE, and other tax revenues), confirming the robustness of the analysis. Thus, the study comes to the conclusion that sustained economic development can be supported by an effective tax structure, especially one that improves customs duties and PAYE collection. Recommendations for policy include examining various tax tools, adjusting tax laws to better suit the objectives of economic development, and, lastly, enacting moderate tax rates to stimulate the economy.

Keywords: Economic Growth, Fiscal Policy, Government Expenditure, Tax Revenue Growth, Tax Reforms, Sustainable Development

I. INTRODUCTION

The governments of the world's poorest nations express a strong commitment to promoting and directing their countries' economic and social progress. This ambition is clearly reflected in the numerous development plans that have emerged from government presses across underdeveloped regions over the past three decades. The tax system is often identified as one of the most powerful levers available to these governments to move their economies from their present to achieve their future development plans (Kazman, 2014).

Tax revenue growth is often seen as the lifeblood of economic development, serving as a primary source of funding for public services and development initiatives. According to Stiglitz and Rosengard (2015) tax revenue is "the compulsory payments made by individuals and corporations to the government, which serve as a primary instrument for resource allocation, income redistribution, and economic stabilization". The government mostly depends on taxes to fund its operations. In order to pay for its essential expenses, the government typically imposes taxes on individuals and businesses. Ensuring effective revenue collection is the main goal of the East African Community's (EAC) revenue authorities. For every authority, assessing the performance of various revenue streams is an essential performance metric. This evaluation includes calculating tax income as a percentage of the country's GDP, comparing actual revenue received with predetermined targets, and examining increase in collections year over year. During the fiscal year 2022-2023, the East African Revenue Authorities (EARAs) had varying revenue results. Three revenue authorities surpassed their targets: SSRA (South Sudan Revenue Authority) at 163.9%, RRA (Rwanda Revenue Authority) at 103.6%, and URA (Uganda Revenue Authority) at 100.2%. On the other hand, TRA (Tanzania Revenue Authority), KRA (Kenyan Revenue Authority), and OBR (Office Burundais des Recettes) fell short by 2.5%, 4.7%, and 5.7%, respectively. In comparison, South Africa's SARS (South Africa Revenue Service) also missed its target by 0.3%, achieving 99.7%, which was lower than the EARAs' average of 109.1% (RRA Report , 2023).

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Economic growth is the increase in a country's overall output of products or services (Toye, 1978). Economic growth is conventionally characterized by increases in GDP or real GDP per capita that occur over the long-term (Ojong et al., 2016). Among the top ten fastest-growing economies in 2019 were six African nations: Rwanda (8.7%), Ethiopia (7.4%), Côte d'Ivoire (7.4%), Ghana (7.1%), Tanzania (6.8%), and Benin (6.7%). However, real GDP growth in East Africa (EA) decreased from 4.7% in 2021 to 4.4% in 2022. During the 2022/23 fiscal year, Rwanda experienced a mixed macroeconomic performance. Inflation saw a sharp rise, increasing from 7.1% to 17.9%, while the Rwandan Franc (RwF) weakened against the US dollar, depreciating from 1,008.0 RwF per USD to 1,075.0 RwF per USD. Despite these economic pressures, the country demonstrated resilience by achieving robust real economic growth, which accelerated from 5.8% in the 2021/22 fiscal year to 8.1% in 2022/23, Rwanda's economy grew by 8.2% in 2023, which was higher than the expected 6.2%. The growth was even stronger in the last part of the year, reaching 10%, Rwanda successfully balanced inflation control, managed external deficits, and ensured fiscal prudence, showcasing a resilient financial sector (RRA, 2023)

In order for the government to finance infrastructure and other critical public services, which in turn stimulate economic activity, tax revenue growth is key to Rwanda's economic development. Increases in direct taxes and taxes on products and services have a major positive impact on Rwanda's GDP, according to research by Nzabirinda (2023) that looks at data from 2006 to 2021. In particular, the GDP increases by 0.19% for every 1% increase in direct taxes and 0.58% for every 1% increase in goods and services taxes. In addition, tax revenue increased by 12.3% in the 2023–2024 fiscal year over the prior period, according to the Rwanda Revenue Authority. This growth was mainly attributed to economic expansion, the automation of tax-related services, and a greater use of electronic invoicing systems (Nzabirinda, 2023). A revenue authority's main objective is to collect taxes that are due in line with the law and to do so in a way that maintains public trust in the tax system and its management. A strategy document that identifies the most important compliance issues in a tax system and describes the revenue agency's approach to addressing them is called a tax compliance improvement plan. By creating such a plan, the agency may create and execute successful compliance initiatives while systematically evaluating and ranking risks. In order to handle the most pressing tax compliance issues, a defined procedure like this guarantees that resources are distributed across various functions in an economical manner designed to improve taxpayer compliance with regard to registration, tax return completion, tax payment, and correct reporting (RRA, 2023).

1.1 Statement of the Problem

In the 21st-century economy, tax revenue is crucial in funding government spending, powering infrastructure growth, and stimulating economic growth with the development of economies, the capacity of a nation to mobilize and use tax revenue effectively determines the level of sustainable development. According to the International Monetary Fund (IMF, 2023), efficient taxation and tax collection contribute significantly towards economic growth as they fund government investment. While tax revenue growth is generally seen as positive indicator of a government's ability to mobilize domestic resources, its actual impact on economic growth remains uncertain, particularly in developing countries like Rwanda. Despite rising tax collections, many such economies continue to face stagnant growth, raising concerns about how effectively tax revenue are being utilized to stimulate productive investment, reduce inequality, improve public sector management but don't promote as well economic growth, this paradox highlights a critical challenge.

Researchers have investigated the interface between tax and economic growth under various contexts (Etienne, 2023; Mureka, 2021; Nzabirinda, 2023) the studies intend to investigate the relationship between tax revenue expansion on economic growth by using Ordinary Least Squares (OLS) method and Vector Error Correction Model. While a large majority of these studies address the contribution of taxation to overall economic performance, the majority stress tax collection effectiveness or its effect on government receipts without directly examining the direct impact on economic growth. In Rwanda, studies mostly address reforms in taxation, tax compliance, and revenue mobilization (Etienne, 2023) but do not comprehensively capture the effect growth in tax revenue has had on GDP, investments, employment, and economic performance as a whole. The specific gap in the literature is the limited understanding of the direct impact of tax revenue growth on Rwanda's economic growth.

This study aims to address the problem through the analysis of the effect growth in revenues from taxation has had on economic growth in Rwanda over a 21-year period from 2003 to 2023 is a timely research project, as need to delve deeper into the relationship between Profit taxes, PAYE, Excise tax, Customs duties and other tax revenues on Rwanda's economic growth. It aims to test the extent to which increased taxation revenue has been responsible for stimulating economic growth. The overall goal is to offer empirical evidence to guide policymakers on developing tax approaches that improve the economic sustainability of revenues and ensuring efficient use of revenues to attain Rwanda's optimal development potential.

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1.2 Research Objectives

i. To analyze the trend of tax revenue growth in Rwanda.
ii. To assess the relationship between tax revenue growth and economic growth in Rwanda during the study period.

1.3 Research Hypotheses

$H0_1$: There has no a significant increase in tax revenue in Rwanda.
$H0_2$: There is no positive significant relationship between tax revenue growth and economic growth in Rwanda during the study period.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Theoretical Model on Taxation

A number of theoretical perspectives have been established to explain the origins and intent of taxes, and one of them provides a particularly pertinent framework for understanding the ways in which tax systems support the growth of inclusive and equitable societies. Important insights into how taxes impact economic development and public policy can be gained from the socio-political theory, benefit theory, and cost of services theory. Service charges According to theory, taxes are payments associated with pricing in a market economy, and people should be responsible for paying for the specific government services they use (Ojong et al., 2016). This argument holds that a person shouldn't have to pay taxes if they don't use public services. Despite emphasizing equity through usage-based contributions, this strategy has drawn significant criticism. Government services are subject to some limitations imposed by the cost of service principle. The government wants to assist those who are less fortunate. Should the theory be put into practice, it would limit the government's ability to provide essential social services and public goods, such infrastructure, healthcare, and education, to those who would not be able to afford them. Furthermore, the theory is less useful for implementing policies, especially in developing nations, due to the challenge of precisely estimating the cost per person for numerous public services.

The Benefit Theory was created in response to these limitations. According to this viewpoint, taxpayers ought to make contributions to the public finances according to the advantages they derive from products and services supplied by the government (Solow, 1956). According to this perspective, taxes are paid by citizens in exchange for the direct and indirect benefits of governmental spending. Although this theory supports taxation by citing personal responsibility and benefit, it has flaws, especially when it comes to estimating the true benefits that each citizen receives from public goods, many of which, like environmental preservation, law enforcement, and national defense, are indispensable and benefit society as a whole. More comprehensively, the socio-political theory of taxation highlights that tax structures ought to be created with the intention of accomplishing more general social goals, like advancing economic development that is inclusive, lowering poverty, and promoting equity (Bird & Zolt, 2005). Taxation is viewed as a policy tool for society change from the socio-political perspective, in contrast to the other two theories that concentrate on the individual's relationship to public service consumption or benefit. In addition to being fair in its allocation, it promotes a tax structure that is sensitive to the historical background and structural requirements of a community.

The socio-political theory offers a useful perspective for comprehending Rwanda's post-1994 fiscal reforms. Rwanda established a tax system after the genocide with the goals of fostering social cohesion, lowering reliance on outside assistance, and guaranteeing fair access to public services in addition to restoring governmental capacity and raising money. An intentional attempt to generate domestic resources while coordinating taxation with national development aspirations is seen in the creation of the Rwanda Revenue Authority and the ensuing tax policy modifications. According to (Fjeldstad & Heggstad, 2012). Rwanda's revenue mobilization strategy shows a purposeful use of taxes to achieve both fiscal recovery and more general socio-political goals like equity and national unity. Thus, the socio-political framework effectively captures the multidimensional role of taxation in Rwanda’s economic recovery and long-term growth strategy.

2.1.2 Ability-to-Pay Principle

A key idea in tax fairness is the ability-to-pay, which states that people should make contributions to the public coffers in accordance with their financial capability, which is commonly determined by their income, wealth, or consumption. This theory supports progressive tax systems higher earners pay a greater share to reduce inequality, promote social justice, preventing tax avoidance and managing administrative complexities. It was notably advanced by Arthur Cecil Pigou in 1928, who emphasized that equitable taxation requires taxing individuals in proportion to their financial strength (Bejakovic, 2020). Economists like Thomas Piketty argue in favor of stronger application of this principle to address inequality through more progressive taxation (Piketty, 2021). In the context of Rwanda, this principle informs the design of the tax code by ensuring that wealthier individuals and profitable businesses contribute more to public revenue, thereby promoting equity while supporting sustainable economic development.

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2.1.3 Solow's Theory of Economic Growth

Economic growth, as described in Solow (1956) model, relies on the accumulation of various forms of capital (both human and physical) while accounting for diminishing returns to these inputs over time. The production capacity of an economy is shaped by the quantity and productivity of its capital (denoted as y) and labor force. To illustrate connection between taxation and economic expansion/decline, utilize the succeeding growth model in which changes in real GDP is determined by changes in both human and physical capital, and some error terms.

Using this theoretical framework, we observed that a country's tax policies have indirect yet significant effects on variables, which ultimately influence GDP growth. A high tax on corporate and individual incomes may disincentive investment in physical capital (k). Similarly, elevated tax burdens can negatively affect labor market participation (m) by discouraging individuals from entering the workforce, reducing working hours, or dissuading them from acquiring new skills or pursuing certain careers. Moreover, tax policy can obstruct productivity growth by limiting the availability of venture capital for innovative, technology-driven businesses and by reducing investment in research development. Since research and development often generates positive spillover effects that enhance labor productivity and per capita output, any reduction in such activities may restrain economic progress (Kairanya, 2016)

2.1.4 Keynesian Theory

According to traditional Keynesian economics, fiscal policies that influence disposable income and expected returns play a significant role in shaping consumer behavior, particularly in terms of spending and saving. A reduction in taxes increases disposable income, which typically leads to higher private consumption (Kairanya, 2016). However, the Ricardian equivalence theory offers a contrasting view: it suggests that consumers may anticipate future tax increases to offset current tax cuts, leading them to save rather than spend the additional income, thereby neutralizing any simulative effect on consumption. Furthermore, an increase in government spending financed through higher taxation can contribute to inflationary pressures. This creates uncertainty regarding the future value of savings and the relative pricing of future goods, both of which are crucial factors in investment decision-making. When inflation rises, real interest rates tend to fall, reducing the incentive to save and discouraging capital accumulation. At the same time, expectations of higher inflation can prompt investors to shift their portfolios away from cash holdings toward tangible assets or productive capital in an attempt to preserve value and enhance. This portfolio adjustment mechanism is described by the Tobin Mundell effect, which highlights how inflation expectations can redirect financial resources toward real investments, potentially spurring economic growth (Ali et al., 2018).

2.1.5 Endogenous Growth Model

Romer and Lucas formulated the endogenous growth theory (Romer, 1994), under which nation's economic progress is primarily due to internal factors such as innovation, building of human capital, and policy decisions instead of the influence of exogenous factors. Romer's argument is that investment in Research and idea building gives rise to rising returns to scale as it increases the productivity of each input. He categorizes ideas as rival-free resources that can be exploited by many people without being used up and underscores the importance of knowledge spillovers in monopolistically competitive environment. Intellectual property rights, such as patents, induce innovation in this environment. Lucas adds to this by focusing on human capital, stressing that education and training not only improve individual productivity (internal effects) but also raise the productivity of others through external effects. He argues that long-term growth relies on sustained investment in people, as these investments increase efficiency and productivity

Second, the endogenous model identifies the role of policies by the government, primarily fiscal policies like taxation, on deciding economic performance. Fiscal policies, in this regard, can be used to generate funds for infrastructure and technological development, both of which are crucial in promoting growth. Therefore, in investigating how taxation impacts economic growth in Rwanda, the endogenous model gives insights by connecting fiscal policy and productivity, innovation, as well as long-run economic growth.

2.1.6 Exogenous Growth Model

The exogenous growth model, specially know through the Solow-Swan model (Solow, 1956), is the neoclassical economic Theory. According to the neoclassical economic theory, technological advancement drives economic growth independently of other economic forces. Long-term economic growth is explained by capital accumulation, population (labor) increase, and technological advancement. The exogenous growth model uses technological variables, savings rates, production, and declining returns of capital to predict economic growth. By rapidly growing a nation's capital, foreign direct investment (FDI) can support economic growth. However, according to the Solow growth model from 1956, this effect does not last forever. As more capital is added, its impact starts to decline due to diminishing returns. Eventually, the economy reaches a point where adding more capital does not lead to further growth. While investment is important early on, lasting economic growth in this model relies on ongoing improvements in technology, which the model assumes happen from outside the system.

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2.1.7 Laffer Curve Theory

In 1974, economist Arthur Laffer introduced the concept known as the Laffer curve, illustrating the theoretical link between tax rates and the government's revenue from taxation. The curve highlights how adjustments in tax rates can influence revenue in two main ways: the arithmetic and the economic effect. This framework suggests that altering tax rates impacts total revenue not only through direct changes in the amount collected but also through its influence on overall economic activity (Trabandt & Uhlig, 2011). Simply put, the arithmetic effect of lowering tax rates is that the quantity of tax revenues (per dollar of tax base) will reduce by the rate decrease. When tax rates rise, the opposite is true. However, the economic effect acknowledges that lower tax rates will have favorable influence on activities, employment, and production. Raising tax rates discourages participation in the activities that are subject to the tax, which has the opposite economic effect. The arithmetic effect always works in the opposition from the economic effect (Kazman, 2014).

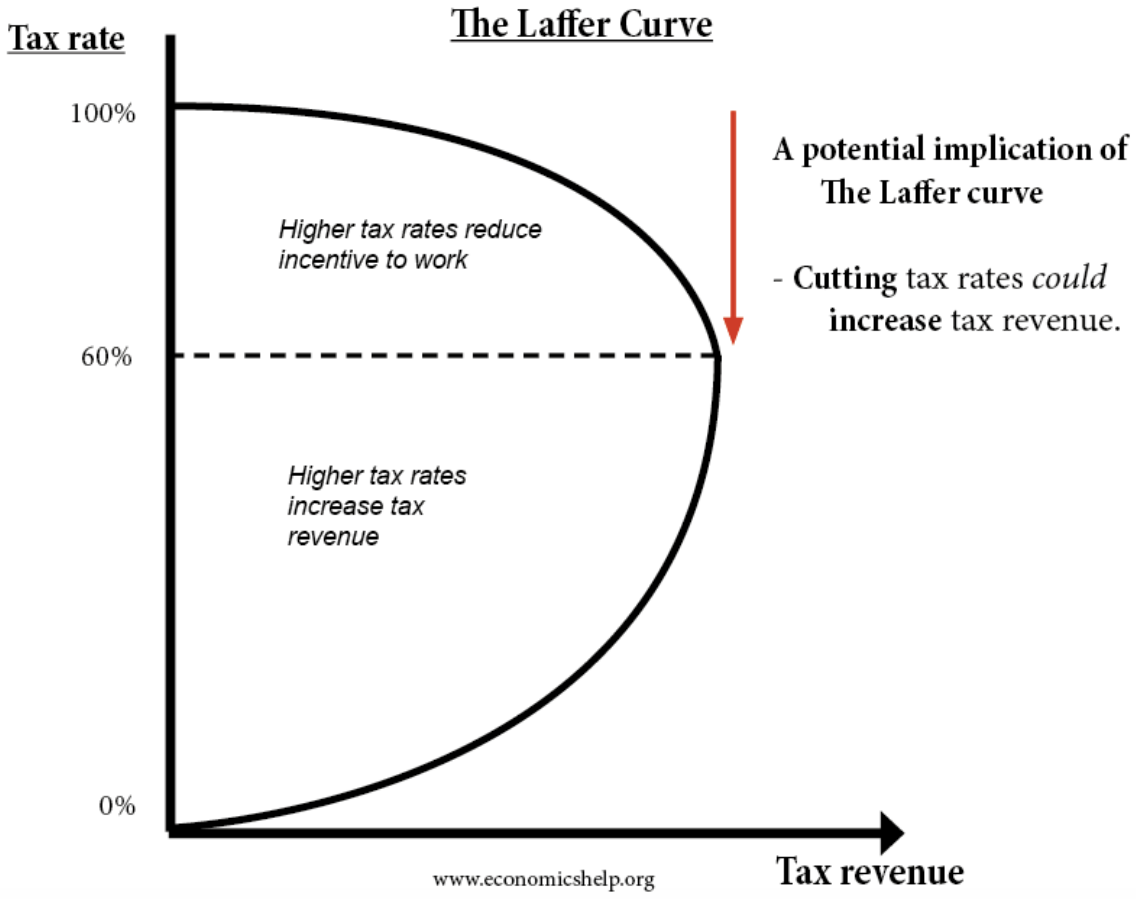

Figure 1
Laffer Curve
Source: Tejvan Pettinger (2018)

2.2 Empirical Review

Numerous empirical studies have investigated the link between tax revenue and economic growth, both in Rwanda and internationally. These studies employed various econometric techniques and focus on different components of taxations as (Umutoni, 2017) provided valuable insights into the relationship between tax revenue growth and economic growth in Kenya, the study utilized a 33-year time series data from 1990 to 2022, analysis have be done through the Vector Error Correction Model (VECM) to analyzed the long-run relationship between those variables and the findings are that tax revenue growth, interest rate, inflation, net FDI to GDP ratio and net exports to GDP ratio have a favorable effect on economic growth.

In a study published in 2022, (Adefolake and Omodero, 2022) evaluated the impact of tax income on Nigeria's economic expansion using time series data from 2000 to 2021, the ADF is used to assess and test the acquired data for unit root. At first difference, the study variables which include GDP, PPT, CIT, and VAT are determined to be stationary. As a result, a long-term association is shown by Johansen co-integration test. In order to assess the impact of PPT, CIT, and VAT on GDP, the study makes use of the vector error correction model (VECM), the results show that VAT and PPT have significant and positive effects on GDP, but CIT has a considerable and negative influence on GDP.

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Nantob (2014) provided an evidence from developing countries by assessing the effect of taxes increase on economic growth of 47 developing countries from 2000 to 2012 by using a dynamic panel data method, found that taxes on income, profits, and international trade have a non-linear impact on economic growth. In contrast, indirect taxes such as VAT and excise duties were found to consistently support economic expansion, suggesting they may be more growth-friendly in developing economies.

According to a regional fact with East Africa Revenue Authorities (2024) who investigated how fiscal factors influence economic growth within the EAC, focusing on Kenya, Uganda, Tanzania, Rwanda, and Burundi over the period 2005-2020. Using the Hausman and Lagrange Multiplier (LM) tests, the researchers determined that the pooled OLS regression model was the most appropriate for parameter estimation and statistical analysis. Their findings revealed that taxation exerted a negative yet statistically significant effect on GDP, with p-value of 0.000 at 5% significance level and a coefficient of 0.438. This study further concluded that public debt negatively affects the EAC's economic performance, whereas gross domestic investment contributes positively.

Babatunde et al. (2017) examined how taxes affected economic growth in Africa between 2004 and 2013. The study used a number of preliminary tests, such as descriptive statistics and stationary tests utilizing the Im, Pesaran, Shin W-statistic, Levin et al., and Augmented Dickey Fuller (ADF) tests. The researchers applied the Hausman test to evaluate the suitability of the model by comparing fixed and random effects approaches. The results indicated a statistically significant positive relationship between tax revenue and GDP, suggesting that increases in tax revenue are associated with growth in economic output. According to Ibn Khaldun's theory of taxation, which supports the beneficial effects of reduced tax rates on labor, output, and economic performance, both high and low taxation levels are therefore conducive to economic growth.

Nizeyimana (2024) examined the impact of tax collection on Rwanda's economic growth using a regression research design and a qualitative methodology, taken Musanze district as a case study (2019-2023). The study's sample size was 56 employees that work in the Musanze District, and SPSS was used to analyze the data. The findings showed that VAT and income taxes had a favorable impact on economic growth. However, customs duties have a less significant effect. The study suggested the improvement of tax system in Musanze district.

Umutoni (2017) examined the effect of government fiscal actions, specifically expansionary policy on Rwanda's economic growth over the 23-year period. The research finds a strong positive relationship between government expenditure, tax revenue, and economic growth. With an R-squared valued of 0.98, the results indicate that 98% of the variation in economic growth can be explained by fiscal variables, suggesting a significant influence of government fiscal interventions. Using empirical methods including stationarity and co-integration tests, the study shows that government spending, tax revenue, and GDP are co-integrated in the long run, meaning they move together over time and share a stable long-term relationship. This implies that fiscal policies have lasting impacts on the economic trajectory of the country.

Nzabirinda (2023) analyzed how different categories of tax revenue have influenced Rwanda's economic growth over 15-year period. Using quarterly data from the RRA and NISR, Direct tax (DT), the tax on goods and services (TGS), and other three primary tax components were the subject of the investigation. Additionally, GDP is used as a stand-in for economic growth in the Tax on international Trade (TIT). Econometric software (E-Views 8.0) was used for the analysis, and the results showed a long-term correlation between GDP and tax receipts, which was validated by Johansen co-integration tests. However, no short-run causality was found among the variables. In terms of individual impact, a 1% increase in DT leads to a 0.19% rise in GDP, while a 1% increase in Tax on Goods and Services results in a 0.58% increase in GDP. Both these components show a positive and significant effect on GDP, indicating its limited role in driving economic performance. The regression model used in the analysis is highly robust, with an adjusted R-squared value of 0.994407, meaning that 99.44% of the variation in GDP is explained by the included tax variables. Based on these results, the study recommended that Rwandan fiscal policy should focus on strengthening domestic tax mobilization particularly Direct Taxes and Taxes on Goods and Services due to their strong positive contribution to economic growth.

A review of the existing literature reveals that most studies examining the relationship between tax revenue growth and economic growth report a strong positive correlation, suggesting that increased tax collection contributes to economic expansion. However, despite consistent growth in tax revenue over the years, Rwanda's economic performance has remained unpredictable, raising important concerns about the actual impact of tax policy on long-term economic outcomes. This inconsistency points to a potential gap in understanding the deeper dynamics of how tax revenues influence growth. Many of the existing studies focus mainly on broad correlations using aggregate data, without adequately investigating the causal mechanisms, the role of different types of taxes, or sector-specific impacts. These overlooked aspects suggest a need for more comprehensive and nuanced empirical research that not only measures the relationship between tax revenue and economic growth but also explores the underlying channels and conditions that shape this relationship in the Rwanda context.

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III. METHODOLOGY

This study adopted a quantitative research approach, supported by econometric modelling technique, specially a multiple linear Regression model. A correlational research design was used to determine the statistical relationship between two or more variables without manipulating them, making it appropriate for this study's aim of examining the association between tax revenue growth and economic growth in Rwanda. Within this framework, the research will use time-series data analysis, a branch of quantitative research that deals with data collected at successive points over time. Time-series analysis is particularly useful for identifying trends, patterns and causal relationships over a historical period, in this case from 2003 to 2023. The study relied exclusively on secondary data obtained from official sources, namely from Rwanda Revenue Authority (RRA) and the National Institute of Statistics of Rwanda (NISR), including their statistical bulletins and annual reports. The dependent variable in this analysis is Gross Domestic Product (GDP), which serves as the primary indicator of economic growth. The independent variables consist of several categories of tax revenue: Profit taxes (CIT, PIT), PAYE (Pay-As-You-Earn), Excise tax, Customs duties and Other tax revenues (including Fuel Levy, road Toll, Royalty tax on Mining, Strategic Reserve Levy Motor vehicle tax, other customs, interests and penalties). The relationship between these variables will be analyzed using E-Views 10 (Econometric Views) software, which allows for advanced econometric test.

IV. FINDINGS & DISCUSSION

4.1 Trend of Variables

To observe the direction and stance of the tax revenue growth in Rwanda.

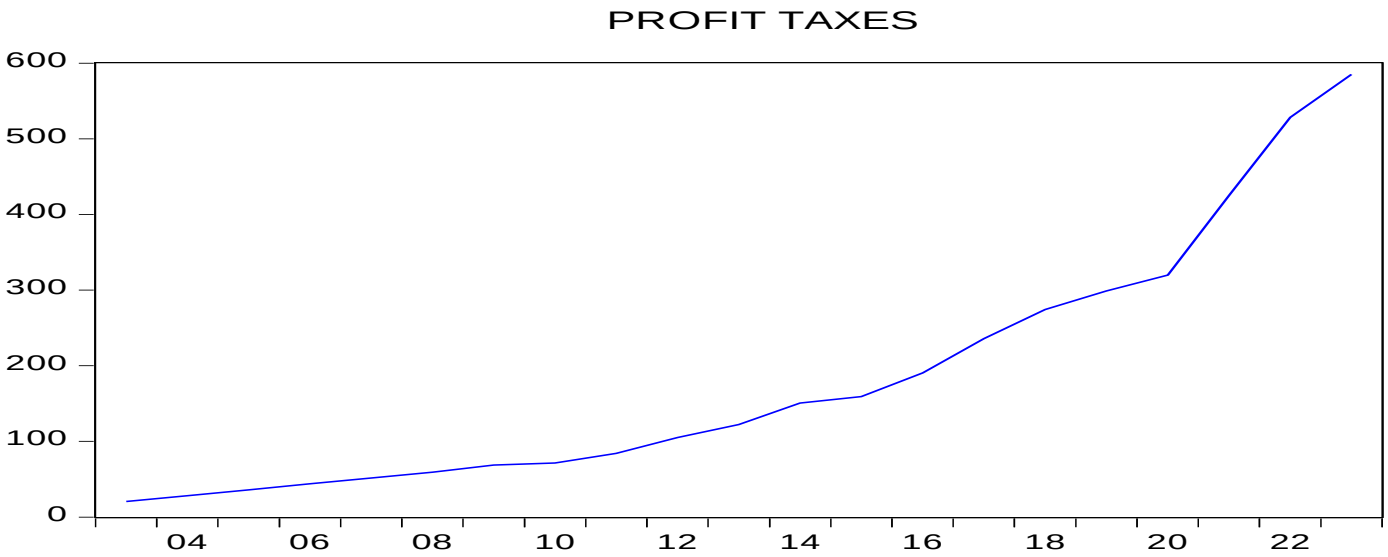

Figure 2

Level of Profit Taxes in Rwanda

The line graph illustrates the trend of Profit Tax revenue in Rwanda from 2003 to 2023, measured in Rwanda francs (RWF) billions. Overall, the graph shows a steady upward trajectory, highlighting continuous growth in tax collections over the two decades. From 2003 to around 2010, the increase was gradual, with revenue rising from below RWF 50 billion to just under RWF 100 billion. Between 2010 and 2019, the growth became more moderate, reaching approximately RWF 300 billion. A brief plateau is noticeable around 2020 to 2021, likely due to the economic impacts of the COVID-19 pandemic. However, from 2022 onwards, there is sharp surge in profit tax revenue, climbing rapidly to nearly RWF 600 billion by 2003.

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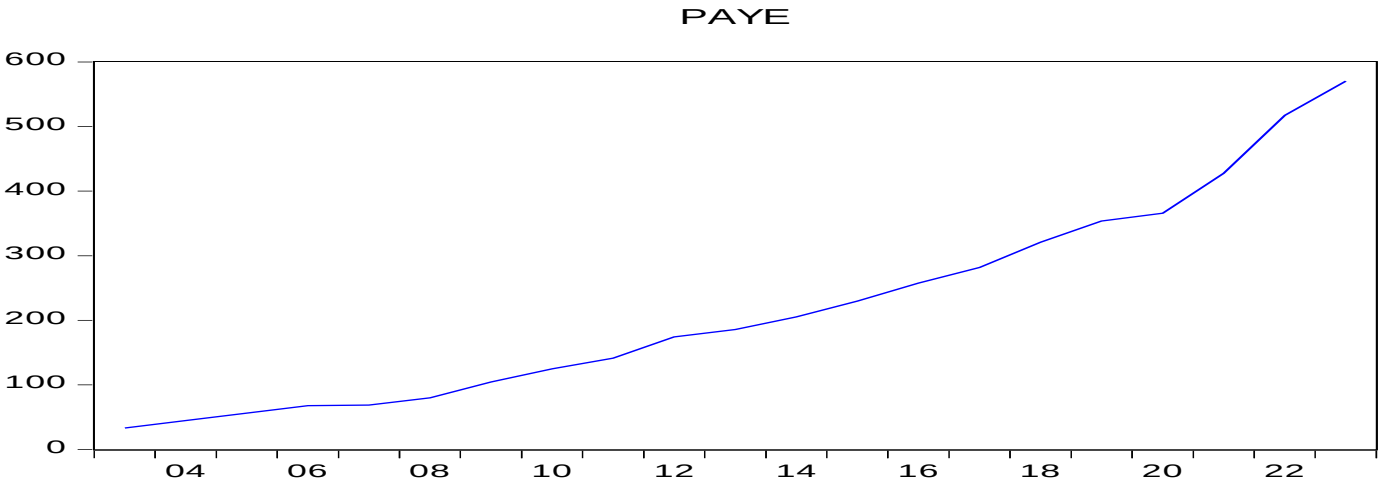

Figure 3
The Extent of PAYE (Pay-As-You-Earn) in Rwanda

The figure illustrates the trend of PAYE (Pay-As-You-Earn) tax revenue in Rwanda from 2003 to 2024, showing a consistent upward trajectory, reflecting sustained growth in formal employment and improved tax collections mechanisms. From modest levels in 2003, PAYE revenue has increased sharply, particularly from around 2017 onward, where the slope of the curve becomes steeper indicating an acceleration in revenue growth. By 2023, PAYE collections approached RWF 600 billion, marking a significant rise compared to earlier years. This steady increase enhances the growing contribution of PAYE to Rwanda's domestic revenue base and likely reflects positive developments in wage growth, labor force formalization, and tax compliance.

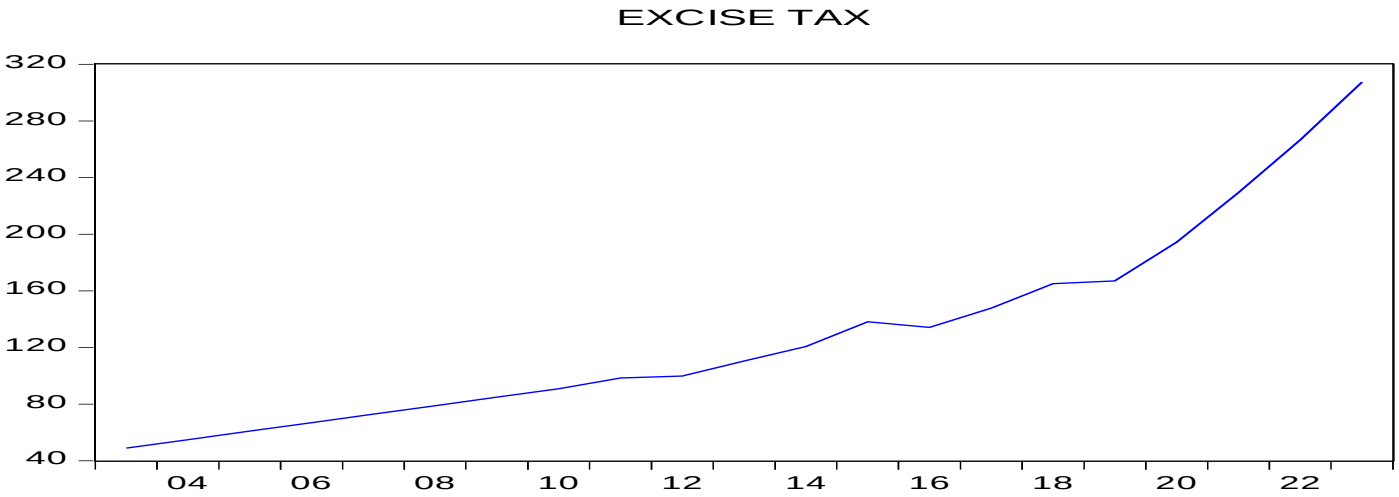

Figure 4
The Extent of Excise Tax in Rwanda

The curve indicates a slow but steady increase in Rwanda's excise tax revenue from 2003 to 2023 in billions, with a gradual rise from 2003 to around 2013, followed by a more pronounced upward trend, especially after 2020. This indicates that the government likely implemented higher excise tax rates or experienced increased in consumption of excisable goods. A slight plateau or slower growth is visible between 2016 and 2018, possibly reflecting temporary policy adjustments.

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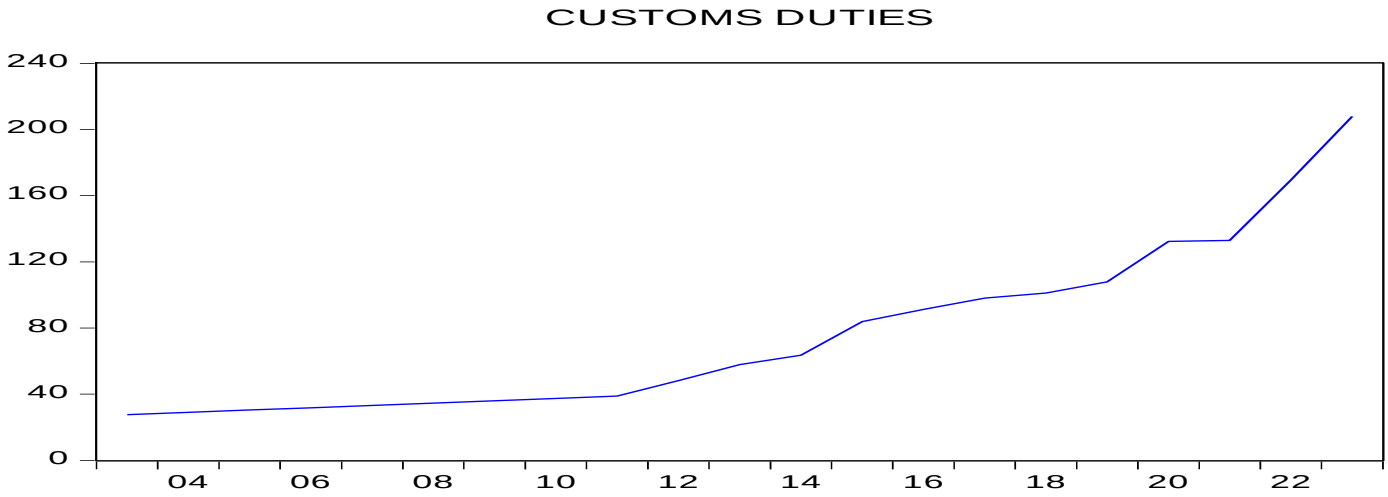

Figure 5
The extent of Customs duties in Rwanda

The figure displays the trend of Customs Duties revenue in Rwanda from 2003 to 2023, measured in Rwandan Francs (RWF) billions. From 2003 to 2023, Rwanda's customs duties increased significantly from RWF 27.6 billion to RWF 207.9 billion, showing a steady upward trend with notable acceleration in certain periods. Between 2003 and 2011, growth was gradual, reflecting stable trade and tax systems, while the period from 2012 to 2015, saw a sharp rise, likely due to improved customs enforcement, increased imports, and regional trade integration. After moderate growth from 2016 to 2019, customs revenue surged again from 2020 to 2023, nearly doubling, possibly driven by post-COVID trade recovery. Overall, the trend illustrates Rwanda's strengthening capacity in revenue collection and expanding international trade.

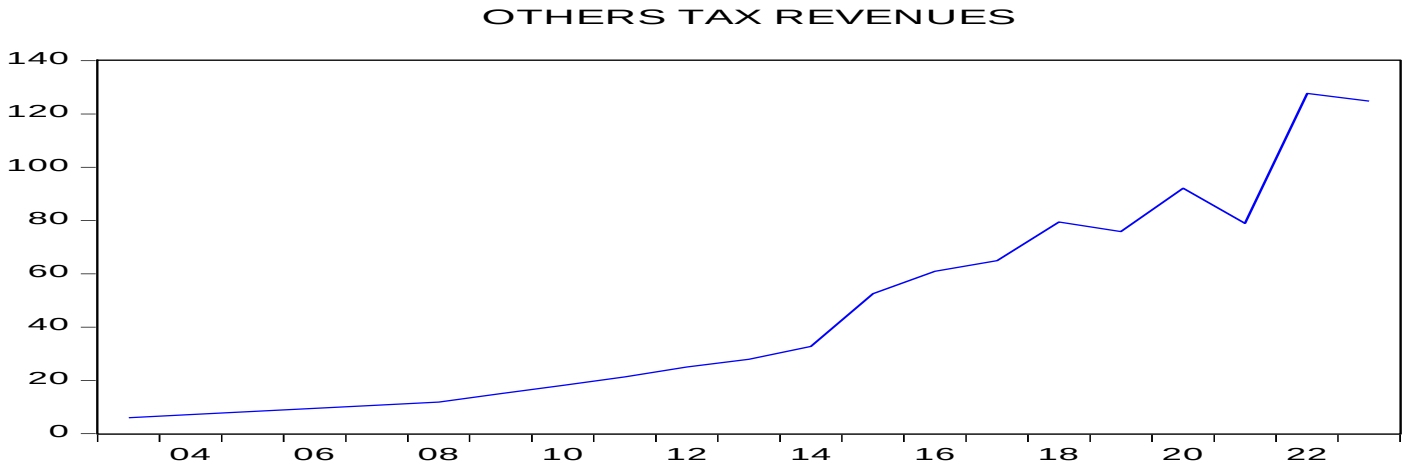

Figure 6
The Extent of Others Tax Revenues

The line graph shows the trend of Other Tax Revenues in Rwanda from 2003 to 2023, measured in billions of Rwanda francs. A significant upward trend showing a growth from RWF 6.0 billion in 2003 to RWF124.8 billion in 2023 indicating a strong improvement in tax collection. The revenue rose steadily between 2003 and 2008, followed by accelerated growth from 2009 to 2014, where it nearly tripled. From 2015 to 2019, the trend continued upward with slight fluctuations, including a dip in 2018. Despite global economic disruptions during the pandemic period, the revenues rebounded sharply by 2021 and remained high through 2023, with only minor declines. Overall, the figure reflects a generally upward trend with periods of fluctuation, indicating growing but volatile performance in non-VAT, non-income taxes revenues over the years.

4.2 Descriptive Analysis

This part is showing the descriptive statistics of data used in this research.

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Table 1

Descriptive Statistics of Variables as Individual Samples

	GDP	CUSTOMS_DUTIES	EXCISE_TAX	OTHERS_TAX_REVENUES	PAYE	PROFIT_TAXES
Mean	5980.286	75.88571	130.3825	45.25238	219.5893	183.7667
Median	4929.000	57.90000	110.4000	27.90000	185.9000	122.2000
Maximum	16355.00	207.9000	307.4000	127.7000	570.4000	585.0000
Minimum	1146.000	27.60000	48.86667	5.966667	33.27500	20.53333
Std. Dev.	4189.159	51.42160	70.70353	38.91670	157.9549	166.3370
Skewness	0.910667	1.059103	1.056584	0.796806	0.736012	1.129891
Kurtosis	3.095548	3.268975	3.332313	2.459841	2.560512	3.236714
Jarque-Bera	2.910591	3.989248	4.003924	2.477451	2.065005	4.517314
Probability	0.233331	0.136065	0.135070	0.289753	0.356115	0.104491
Sum	125586.0	1593.600	2738.033	950.3000	4611.375	3859.100
Sum Sq. Dev.	3.51E+08	52883.63	99979.78	30290.19	498995.3	553359.8
Observations	21	21	21	21	21	21

Table 1 shows measures of central tendency (mean, median), measures of dispersion (standard deviation), and measures of normality (kurtosis, skewness) and illustrates the Jarque-Bera, which measured the difference between skewness and kurtosis of the series. Based on the probabilities of Jarque-Bera, which are all greater than 0.05, all variables are normally distributed.

In conformity with these results, the GDP of Rwanda from 2003 to 2023 was RWF 5980.286 billion on average, with a standard deviation of RWF 4189.159 billion. From 2003 to 2023, Customs duties were 75.88571 billion on average with a standard deviation of RWF 51.42160 billion. Excise tax was RWF 130.3825 billion on average with a standard deviation of RWF 70.70353 billion. Other tax revenues were RWF 45.25238 billion on average with a standard deviation of RWF 38.91670 billion. Average and standard of PAYE were RWF 219.5893 and 157.9549 billion respectively. Profit taxes were RWF 183.7667 billion on average and RWF 166.3370 billion on standard deviation.

4.3. Preliminary test

Before interpreting the results of a regression analysis, it is essential to conduct preliminary tests to ensure the validity and reliability of the model.

4.3.1. Stationarity Test (Unit Root Test)

Table 2

Augmented Dickey Fuller (ADF) Test

Null Hypothesis: has a unit root							
Exogenous: Constant							
Lag Length: 0 (Automatic - based on SIC,maxlag=2)							
Variable	Level/First difference	ADF Test Statistic	1% Critical Value	5% critical Value	10% critical Value	P-value	Stationary?
GDP	First difference	-4.33026	-3.857386	-3.04039	-2.66055	0.0038	Yes (5%)
PAYE	First difference	-6.41126	-3.886751	-3.05216	-2.66659	0.0001	Yes (5%)
EXT	First difference	-6.48140	-3.857386	-3.04039	-2.66055	0.0001	Yes (5%)
CUSD	First difference	-7.66407	-3.857386	-3.04039	-2.660551	0.0000	Yes (5%)
OTR	First difference	-7.16006	-3.831511	-3.02997	-2.655194	0.0000	Yes (5%)
PFT	First difference	-5.34877	-3.886751	-3.05216	-2.666593	0.0006	Yes (5%)

4.3.2. Test for Co-Integration

Since all variables were found to be non-stationary at their level forms but became stationary after first differencing, a Johansen cointegration test was conducted to access the existence of any long-run equilibrium relationships among them. This approach was based on Unit root tests applied to the residuals from regression model. The results of Johansen test, presented in Table 3, indicated whether cointegration exists among the variables under study.

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Table 3

Unrestricted Cointegration Rank Test (Trace)

Sample (adjusted): 2003 2023				
Included observations: 20 after adjustments				
Trend assumption: Linear deterministic trend (restricted)				
Series: GDP CUSTOMS_DUTIES EXCISE_TAX OTHERS_TAX_REVENUES PAYE PROFIT_TAXES				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.999339	331.4127	117.7082	0.0000
At most 1 *	0.982827	184.9632	88.80380	0.0000
At most 2 *	0.934951	103.6749	63.87610	0.0000
At most 3 *	0.642326	49.02273	42.91525	0.0109
At most 4 *	0.579439	28.46007	25.87211	0.0233
At most 5	0.426982	11.13677	12.51798	0.0841

The results of the Johansen cointegration trace test indicate the presence of long-run equilibrium relationships among the variables GDP, Customs Duties, Excise Tax, Other Tax Revenues, PAYE, and Profit Taxes over the period 2003 to 2023. The test rejects the null hypothesis of no cointegration up to five cointegrating equations, as the trace statistics for "None" through "At most 4" are all greater than their corresponding critical values at the 5% significance level, with p-values below 0.05. Only at "At most 5" is the null not rejected, with a p-value of 0.0841, indicating that no more than five cointegrating relationships exist. This suggests that although the individual series may be non-stationary, they share a stable, long-run relationship (Boadway & Wildasin, 1994).

4.4 Modelling

Regression analysis was used to see if there was a link between tax revenue growth and economic growth (GDP). To compute regressions for the study, the researcher used econometric software (E-Views 10).

Table 4

Regression analysis

Dependent Variable: D(GDP,1)				
Method: Least Squares				
Sample (adjusted): 2004 2023				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-47.42997	102.9294	-0.460801	0.6520
D(CUSTOMS_DUTIES,1)	36.55464	9.485078	3.853910	0.0018
D(EXCISE_TAX,1)	-7.380042	9.862855	-0.748266	0.4667
D(OTHERS_TAX_REVENUES,1)	-13.71629	6.155281	-2.228377	0.0428
D(PAYE,1)	20.47961	7.523209	2.722191	0.0165
D(PROFIT_TAXES,1)	3.728520	5.760843	0.647218	0.5280
R-squared	0.912147	Mean dependent var		760.4500
Adjusted R-squared	0.880771	S.D. dependent var		725.6327
S.E. of regression	250.5577	Akaike info criterion		14.12858
Sum squared resid	878908.6	Schwarz criterion		14.42730
Log likelihood	-135.2858	Hannan-Quinn criter.		14.18689
F-statistic	29.07143	Durbin-Watson stat		2.365991
Prob(F-statistic)	0.000001			

As shown in this table 5, Excise tax, Profit taxes are statistically insignificant, since their p-value=0.4667, 0.5280 >0.05 do not impact GDP, we eliminate in the model. Therefore, we consider Customs duties, others tax revenues, PAYE.

Then we run the OLS regression on those four variables, and we got the following results.

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Table 5

Regression Analysis between GDP, Customs Duties, Others Tax Revenues and PAYE

Dependent Variable: D(GDP,1)				
Method: Least Squares				
Sample (adjusted): 2004 2023				
Included observations: 20 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-80.27257	88.61488	-0.905859	0.3785
D(CUSTOMS_DUTIES,1)	31.56118	6.512794	4.846028	0.0002
D(OTHERS_TAX_REVENUES,1)	-13.22934	5.572771	-2.373926	0.0305
D(PAYE,1)	23.63706	3.250277	7.272323	0.0000
R-squared	0.908230	Mean dependent var		760.4500
Adjusted R-squared	0.891023	S.D. dependent var		725.6327
S.E. of regression	239.5437	Akaike info criterion		13.97221
Sum squared resid	918098.9	Schwarz criterion		14.17135
Log likelihood	-135.7221	Hannan-Quinn criter.		14.01108
F-statistic	52.78278	Durbin-Watson stat		2.569780
Prob(F-statistic)	0.000000			

The regression results indicate a strong and statistically significant relationship between changes in GDP and changes in the selected tax revenue components over the period 2004 to 2023. The model which explains approximately 91% of the variation in GDP growth (R-squared= 0.9082), shows that a one-unit increase in the change of CUSTOMS_DUTIES leads to a significant increase in GDP growth by about 31.56 units (p-value=0.0002). Whereas our study reported that customs duties (which is part of TIT) exert a positive effect on GDP in Rwanda, Nzabirinda (2023) in his study where analyzing different categories of tax revenue have influenced Rwanda's economic growth over 15-year period in Rwanda found no significant relationship between Tax on international Trade (TIT) and GDP.

A one-unit increase in PAYE (Paye-As-You-Earn) results in a GDP growth increase of approximately 23.64 units (p-value=0.0000). These findings highlight the positive economic influence of trade-related revenues and formal sector income taxes. Similarly, Nizeyimana (2024) in assessing the impact of tax collection on Rwanda's economic growth using a regression research design and a qualitative methodology, found that income taxes had a favorable impact on economic performance.

This result provides a new insight by showing that while customs duties and PAYE contribute positively to Rwanda's GDP, other tax revenues have a negative and significant impact. A one-unit increase in the change of OTHERS_TAX_REVENUES is associated with a significant decrease in GDP growth by approximately 13.23 units (p-value= 0.0305), indicating that not all tax revenue sources contribute positively to economic expansion. The negative coefficient suggests these other taxes may be distortionary or less efficiently collected, potentially dampening economic activity. The constant term is (-80.27) is statistically insignificant (p-value=0.3785), implying it does not meaningfully explain variations in GDP growth within the model.

The overall regression is highly significant, with an F-statistic of 52.78 and an associated p-value of 0.000000, confirming that the model's explanatory variables jointly have a strong effect on GDP growth. The adjusted R-squared value of 0.8910 reinforces the model's robustness, confirming the strong relationship between tax revenue and GDP which agree with Umutoni (2017), adjusting for the number of predictors included. Additionally, the Durbin-Watson statistic 2.57 indicates the absence of significant autocorrelation in the residuals, supporting the reliability of the estimated coefficients.

Thus:

GDP=-80.27257 + 31.56118CUD+ 23.63706PAYE-13.22934OTR

4.5 Diagnostic Test (Post-Test)

This section includes tests typically used to assess model specification include tests for autocorrelation, Heteroskedasticity, normality of residuals, and functional form.

4.5.1 Normality Test

This normality test was used to check whether the residuals (errors) of a model follow a normal distribution.

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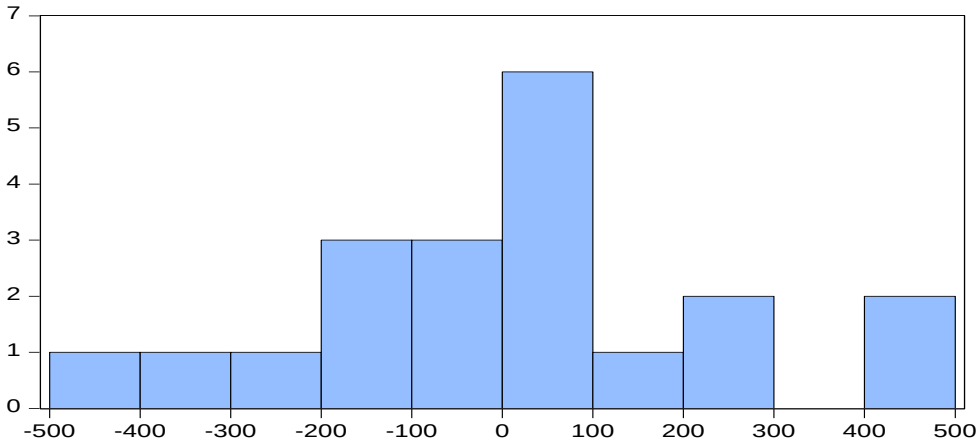

Figure 7
Normality Distribution

The histogram of residuals appears approximately symmetric, and the summary statistics support this visual impression. The Jarque-Bera test statistic is 0.016941 with a P-value of 0.991565, which is much greater than the 0.05 significance level. Therefore, we fail to reject the null hypothesis that the residuals are normally distributed. Additionally, the Skewness (0.071233) is very close to 0, and Kurtosis (3.005761) is very close to the normal value of 3 both further supporting normality. These results indicate that the residuals of the model follow a normal distribution, satisfying one of the key OLS assumptions and validating the reliability of inferential statistics.

4.5.2. Multi-collinearity Test Analysis and Discussions

To ensure the reliability of the regression results by using the Variance Inflation Factors to check for the Multicollinearity. A VIF value below 10 suggests that a variable is not afflicted by multi-collinearity.

Table 7
Multi collinearity Test

Variance Inflation Factors			
Sample: 2003 2023			
Included observations: 20			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	10594.45	3.375148	NA
D(CUSTOMS_DUTIES,1)	89.96670	6.030499	3.701187
D(EXCISE_TAX,1)	97.27591	9.850733	4.672367
D(OTHERS_TAX_REVENUES,1)	37.88749	2.180833	1.754718
D(PAYE,1)	56.59867	4.573012	7.567984
D(PROFIT_TAXES,1)	33.18732	7.290971	5.869206

The centered Variance Inflation Factor (VIF) values indicate that multicollinearity is present but not severe in most of the model's independent variables. D(OTHERS_TAX_REVENUES), D(CUSTOMS_DUTIES), and D(EXCISE_TAX) show low to moderate VIFs of 1.75, 3.70, and 4.67, respectively, which are within acceptable limits and suggest low multicollinearity. However, D(PAYE), and D(PROFIT_TAXES) exhibit higher VIF values of 7.57 and 5.87, indicating moderate multicollinearity. While these values are below the conventional threshold of 10, they suggest some correlation between these regressors and others in the model, which could inflate standard errors and reduce the precision of individual coefficient estimates. Overall, multicollinearity is not at a critical level, but attention may be warranted if interpretation of individual tax components is a primary concern.

4.5.3 Heteroskedasticity

To determine whether the variance of the errors terms in a regression model is constant (homoskedastic) or changing (heteroskedastic) across observations.

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Table 8

Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.149965	Prob. F(5,14)	0.3805
Obs*R-squared	5.822658	Prob. Chi-Square(5)	0.3239
Scaled explained SS	2.861320	Prob. Chi-Square(5)	0.7214

The results of the Breusch-Pagan-Godfrey test show that all p-values (F-statistic: 0.3805, Obs*R-squared: 0.3239, Scaled explained SS: 0.7214) are greater than the 0.05 significance level, indicating that we fail to reject the null hypothesis of homoskedasticity. This suggests there is no evidence of heteroskedasticity in the residuals of the model. Therefore, the Ordinary Least Squares (OLS) estimators remain BLUE (Best Linear Unbiased Estimators), and the standard errors, confidence intervals, and hypothesis tests can be considered reliable. However, while the absence of heteroskedasticity supports the validity of OLS.

4.5.4. Correlogram

To check whether the residuals are independently distributed whether there's any serial correlation (autocorrelation) remaining at various lags.

Table 9

Correlogram Test

Date: 07/16/25 Time: 15:33
Sample: 2003 2023
Included observations: 20
Q-statistic probabilities adjusted for 5 dynamic regressors

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	0.281	0.281	1.8297	0.176
		2	-0.147	-0.245	2.3562	0.308
		3	-0.017	0.120	2.3634	0.500
		4	-0.082	-0.178	2.5488	0.636
		5	-0.136	-0.038	3.0897	0.686
		6	0.035	0.061	3.1273	0.793
		7	-0.081	-0.186	3.3475	0.851
		8	0.010	0.169	3.3513	0.910
		9	0.044	-0.131	3.4285	0.945
		10	-0.107	-0.057	3.9279	0.951
		11	-0.097	-0.037	4.3842	0.957
		12	-0.169	-0.281	5.9492	0.919

*Probabilities may not be valid for this equation specification.

The Ljung-Box Q-statistics test results indicate that there is no significant autocorrelation in the residuals of the model up to lag 12. All the p-values associated with the Q-statistics at each lag are well above the 0.05 significance level (0.176 at lag1, 0.793 at lag6, and 0.919 at lag12), meaning we fail to reject the null hypothesis of no autocorrelation. This suggests that the residuals are independently distributed, satisfying one of the key assumptions of a well-specified time series model. Therefore, the model does not suffer from autocorrelation issues.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study attempted to answer the central question of: What is the effect of tax revenue growth on economic growth in Rwanda during the period of 2003 to 2023? To answer this question, the researcher employed a time series analysis and a quantitative research design. Using a multiple linear regression model, the study evaluated the individual impacts of various components of tax revenue growth including customs duties, Pay-As-You-Earn (PAYE), excise tax, profit taxes, and other tax revenues on Gross Domestic Product (GDP). Analyzing the trend of these components of tax revenue growth changed throughout time and their level fluctuated irregularly according to economic activity. In agreement with the empirical findings, the multiple linear regression analysis revealed that customs duties and PAYE have a positive and statistically significant effect on economic growth, indicating that these tax instruments contribute effectively to Rwanda's GDP growth. In contrast, other tax revenues exhibit a significant negative effect on GDP, suggesting inefficiencies economic implications associated with these sources of revenue. Additionally, excise tax and profit taxes were found to be insignificant, implying a minimal or negligible influence on GDP within the study period.

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Overall, the study's objectives were fully achieved, providing insights that are crucial for policymakers aiming to optimize tax policy as a tool for sustainable economic growth.

5.2 Recommendations

Based on the results of the study on the effect of tax revenue growth on economic growth in Rwanda from 2003 to 2023, the following recommendations are proposed to inform fiscal policy and optimize economic growth. These recommendations aim to provide actionable information to policymakers, the Rwanda Revenue Authority to improve tax policy and administration, thereby contributing to sustainable economic growth and development in Rwanda.

The following is to: Strength customs duties and PAYE collection: given their positive impact on economic growth, the RRA should focus on improving customs duties and PAYE collection mechanisms, ensuring efficient tax administration and minimizing tax evasion. Optimize other tax revenues and review excise tax and profit taxes: the negative effect of other tax revenues on GDP suggests inefficiencies in tax collection. Due to their insignificance, the government should review and reform these tax instruments to ensure they contribute positively to economic growth.

Implement moderate tax rates: A balanced tax rate can stimulate economic growth. Policymakers should aim for moderate tax rates that encourage investment, entrepreneurship, and job creation while generating sufficient revenue for public expenditures. Tax policy reforms: The government should regularly review and reform tax policies to ensure that they align with economic development goals. Researchers should further research on topics such as effectiveness of revenue collection, impact of tax evasion, tax burdens, tax policy and investment, on Rwanda's economic growth is crucial, these areas can provide valuable insights and promote economic growth in Rwanda.

REFERENCES

Adefolake, A. O., & Omodero, C. O. (2022). Tax revenue and economic growth in Nigeria. *Cogent Business & Management, 9*(1), 1–15.

Ali, A. A., Ali, A. Y. S., & Dalmar, M. S. (2018). The impact of tax revenues on economic growth: A time series evidence from Kenya. *Academic Research International, 9*(3), 163–170.

Babatunde, O. A., Ibukun, A. O., & Oyeyemi, O. G. (2017). Taxation revenue and economic growth in Africa. *Journal of Accounting & Taxation, 9*(2), 11–22.

Bejaković, P. (2020). How to achieve efficiency and equity in the tax system? *Revija za socijalnu politiku, 27*(2), 137–150.

Bird, R. M., & Zolt, E. M. (2005). Redistribution via taxation: The limited role of the personal income tax in developing countries. *UCLA Law Review, 52*(6), 1627–1695.

Boadway, R., & Wildasin, D. (1994). Taxation and savings: A survey. *Fiscal Studies, 15*(4), 467–512.

East Africa Revenue Authorities. (2024). *East Africa Revenue Authorities Regional Comparative Report (2023/2024).* Nairobi, Kenya: East Africa Revenue Authorities.

Etienne, N. (2023). Impact of tax revenue on economic growth in Rwanda from 2006–2021. *International Journal of Management Research & Economics, 3*(1), 57–73.

Fjeldstad, O. H., & Heggstad, K. K. (2012). *Local government revenue mobilisation in Anglophone Africa (CMI Working Paper No. 6/2012).* Bergen, Norway: Chr. Michelsen Institute.

International Monetary Fund. (2023). *World Economic Outlook: Navigating Global Divergences.* Washington, DC: International Monetary Fund.

Kairanya, K. A. (2016). *Impact of taxation on economic growth in Kenya (1975–2014)* (Master's thesis). Nairobi, Kenya: University of Nairobi.

Kazman, S. B. (2014). *Exploring the Laffer curve: Behavioral responses to taxation* (Undergraduate thesis). Burlington, VT: University of Vermont.

Mureka, A. S. (2021). *Influence of fiscal factors on economic growth in the East African Community* (Master's thesis). Bungoma, Kenya: Kibabii University.

Nantob, N. (2014). Taxes and economic growth in developing countries: A dynamic panel approach. *MPRA Paper No. 61346.* Munich, Germany: Munich Personal RePEc Archive.

Nizeyimana, K. (2024). Effect of tax collection to the economic development of Rwanda: A case of Musanze District (2019–2023). *International Journal for Multidisciplinary Research, 10*(2), 18853–18861.

Nzabirinda, E. (2023). Impact of tax revenue on economic growth in Rwanda from 2006–2021. *International Journal of Management Research & Economics, 3*(1), 57–73.

Ojong, C. M., Anthony, O., & Arikpo, O. F. (2016). The impact of tax revenue on economic growth: Evidence from Nigeria. *IOSR Journal of Economics and Finance, 7*(1), 32–38.

Piketty, T. (2021). *Capital and ideology: A global perspective on inequality regimes.* London, United Kingdom: The British Journal of Sociology / Wiley.

Romer, P. M. (1994). The origins of endogenous growth. *Journal of Economic Perspectives, 8*(1), 3–22.

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Rwanda Revenue Authority. (2023). *Tax Compliance Improvement Plan*. Kigali, Rwanda: Rwanda Revenue Authority.

Rwanda Revenue Authority. (2023, January). *East Africa Revenue Authorities Regional Comparative Report: Rwanda.* Kigali, Rwanda: Rwanda Revenue Authority.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics, 70*(1), 65–94.

Stiglitz, J. E., & Rosengard, J. K. (2015). *Economics of the public sector* (4th International Student ed.). New York, NY: W. W. Norton & Company.

Trabandt, M., & Uhlig, H. (2011). The Laffer curve revisited. *Journal of Monetary Economics, 58*(4), 305–327.

Toye, J. F. J. (Ed.). (1978). *Taxation and economic development: Twelve critical studies.* London, United Kingdom: Frank Cass Publishers.

Umutoni, C. (2017). *The impact of expansionary fiscal policy on economic growth (1992–2015): A case study of Rwanda* (Master's thesis). Kigali, Rwanda: University of Rwanda.

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The challenges of competence-based training pedagogical approaches in improving English communication in secondary schools in Tanzania: A case of Temeke municipality

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ABSTRACT

This study assessed the challenges of implementing Competency-Based Training (CBT) instructional methods for improved English communication skills in Tanzania's Temeke Municipality high schools. The study was guided by the two theories, namely social learning theory and diffusion of innovations theory. It also adopted a convergent parallel mixed-methods design by applying qualitative and quantitative methods for data collection. Further, data were collected through surveys, interviews, and classroom observation from the sampled 100 secondary school teachers in the municipality. The data were analyzed by using SPSS for quantitative data and NVivo for qualitative data, whereby descriptive and content analysis were employed, respectively. Results indicated that even though CBT has the potential to improve students' communication of English, several challenges hinder its effective application. Such challenges included insufficient teacher training, lack of teaching and learning materials, and unsuitable classroom environments. The majority of the teachers reported that they were not adequately trained to implement CBT in an effective way, and a critical shortage of materials such as textbooks, multimedia tools, and technology for interactive learning was reported. The study also pointed out that the traditional classroom settings, which were not very flexible to accommodate cooperative activities, also restricted the effective application of CBT methods. On this foundation, the study suggested improvement in the training of teachers, provision of resources, classroom organization, and policy formulation to facilitate the adoption of CBT in secondary schools. The suggestions are to close the gaps noted and foster better adoption of CBT to enhance English communication skills among secondary school learners in Temeke Municipality.

Keywords: Competency-Based Training, English Communication, Pedagogical Approaches, Secondary Schools, Teacher Preparedness, Teaching Resources, Temeke Municipality, Tanzania

I. INTRODUCTION

The importance of English as a global language cannot be exaggerated as it has been used as primary communication language (Kurniawan, 2024; Rao, 2019). According to Sung-Yul Park (2021), being proficient in English is associated with various benefits, including exposure to global information, enhanced cognitive capacity, and enhanced employability. It also asserted that, English language proficiency is essential for economic development and social cohesion, particularly in non-native English-speaking countries (Ara, 2020; Jenkins & Panero, 2024). With a more globalized world, English proficiency has become a central ability for worldwide communication, research, and professional advancement. It is not just the dominant language in international discourse but also the dominant educational medium in the majority of global educational systems (Ahmad & Khan, 2023; Winaldo & Oktaviani, 2022). Terasawa (2024) asserted that, in non-English-speaking countries, it is widely recognized that English language skills are closely linked to socioeconomic status (SES). Therefore, as a consequence, it is imperative to enhance English communication skills among students so that they can actively engage in socio-economic activities (Ehtsham *et al*., 2023).

English has gained acceptance in Africa as an important aspect of education and career advancement as It has been adopted by the majority of nations on the continent as a possible official language or prevalent mode of instruction in their educational system (Maluleke, 2019; Mazrui, 2019; Roberts & Mort, 2023; wa Thiong'o, 2023). English is a global language of high significance and with several roles and functions for Africans within Africa and to communicate with other continent individuals. It is of great significance in media and entertainment, diplomacy, international business and tourism, migration, and education (Hickey, 2020; Mufwene *et al*., 2021; Zeller & Posel, 2020).The trend says it all regarding the necessity of English speaking skills as a vehicle for acquiring higher education, acquiring employment, and participating in global discussion. As Curtis and Romney (2019) posit, English is an intersectional language in most multilingual African societies, bringing together communication among many different ethnic groups and regions. Its importance in the educational industry in Africa is also emphasized by the fact that it forms a central part of academic

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curricula and is a prerequisite for comprehension and writing scholarly material, particularly in science and technology fields.

In Tanzania, English serves as a medium and subject of instruction at secondary and tertiary levels (Ideh, 2019; Malima *et al*., 2021; Nyamubi, 2019). Even though Swahili is the national and most widely spoken language in Tanzania, English serves as the medium of instruction from secondary school level to onward. The dual-language policy aims to equip students with linguistic skills that will be applied for tertiary education and for integrating into the global labor market (Barrett *et al*., 2024; Wenga & Malingumu, 2024). However, the proficiency levels of students, especially in rural areas where the students and teachers have minimal exposure to English outside the schools, remain an issue of concern (Ideh, 2021). The effectiveness of Tanzania's English language instruction is usually thwarted by inferior instructional materials, inferior instructor training, and inferior learning support environments, as speculated by Mwalongo (2025). A study by Mwamakula and Magashi (2023) indicated that most Tanzanian rural secondary school students struggle with basic English communication skills. The issues cut across several aspects, including the limited use of the language, lack of adequate teaching materials, and insufficient trained English instructors.

The adoption of the competency-based curriculum (CBC) in secondary schools has seen an immense change in the education systems of most countries; Tanzania included (Andrew, 2021; Msamba *et al*., 2023; Mulenga & Kabombwe, 2019; Ndomondo, 2024). The curriculum lays great focus on preparing students with real-world knowledge and skills, particularly in the learning of English, to prepare them for life in the future. Competency-based teaching (CBT) practices focusing on acquiring and using skills have been proposed as a way of improving English proficiency in schools (Msamba *et al*., 2023). Kiggundu *et al*. (2025) describe CBT practices as focusing on equipping students with specific competencies or skills rather than on the mere transfer of theoretical knowledge. These methods are designed to engage learners actively, target precise learning needs, and provide constant feedback. Conventional CBT methods have the potential to close the gap between theoretical knowledge and actual practice and hence enhance language proficiency (Kangalawe, 2024).

Competency-based teaching methods have gained much worldwide popularity as a means to enhance better academic achievement (Ndomondo, 2024). Given the emphasis on practical application, personalized learning, and continuous assessment, competency-based education (CBE) aims to create learners possessing the ability to implement their knowledge in real-world circumstances. Predominantly, the use of CBT methods in enhancing English communication skills is an imperative to address educational disparities and ensure equal access to education opportunities (Msamba *et al*., 2023; Ndomondo, 2024). Despite the global trend towards CBE, several challenges are still present, particularly in rural and less-resourced Tanzania.

Lack of effective teaching and learning materials, classroom overcrowding, ineffective training of teachers, socio-economic limitations, and lack of in-service training affect the effectiveness of such teaching modes to a large degree in most of Tanzania (Kangalawe, 2024). Tanzanian rural schools especially provide a unique case study for the research of these dynamics because they are especially disadvantaged in CBT due to big class sizes, limited time, and lack of teaching resources such as textbooks (Mlenge, 2024; Senyagwa, 2021)). For the case of Temeke secondary schools, comparatively few studies have been conducted so far in order to assess the influence of CBT methods on the teaching of English communication skills to students. Thus, the present study is recommended to close this research and knowledge gap. In general, the study aims to offer evidence-based facts that inform education policy, curriculum planning, and instructional practices that can improve English language teaching in Tanzanian rural secondary schools.

The study also research aims at providing practical suggestions on the best way to enhance the implementation and effectiveness of CBT methods, towards enhanced education results and opportunities for the learners in the region. The study examines the challenges facing competence based training pedagogy practices in improving English communication in Temeke municipality secondary schools in Tanzania. The aim study will include a comprehensive analysis of current English communications skills, stakeholder opinions, identifying the impact of CBT, and other issues of implementation, this study aims at contributing meaningful information to policymakers, teachers, and stakeholders in Tanzania and elsewhere

1.1 Research Objective

This study assessed the challenges of implementing Competency-Based Training (CBT) instructional methods for improved English communication skills in Tanzania's Temeke Municipality high schools.

II. LITERATURE REVIEW

2.1 Theoretical Reviews

A number of theories have been reviewed in this study on competence based training pedagogical approaches in improving English communication in secondary schools in Tanzania. However, for the purposes of this research, the social learning theory and the diffusion of innovation theory are the ones that will be used by the research to assess the

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efficacy of CBT methods in developing students' English communication abilities in rural secondary schools in Temeke municipality in Tanzania. These are discussed in greater detail in the sections to follow.

2.1.1 Social Learning Theory

Bandura and Walters (1977) developed the Social Learning Theory to contend that learning is accomplished through observation, imitation, and modeling of others' behaviors and attitudes. The theory has been applied widely in education studies to describe students' learning of new skills and behaviors in social settings. Social learning, outcomes Bandura and Walters (1977) contend, is individualized learning that takes place in a social setting. In education research, the theory has been used in examining the roles played by peer interaction, teacher modeling, and collaborative learning in enhancing student outcomes. Within the context of the current research, the theory will be applied in understanding how English communication competencies learning by students in rural secondary schools in Temeke is affected by their exposure to teachers' CBT approaches (Firmansyah & Saepuloh, 2022; Saka, 2025). It will assist in examining how learning through observation of competent language use and participation in interactive activities can improve the language abilities of students in rural secondary schools in Temeke. A weakness is the challenge of measuring and accounting for the multitudes of social variables that may affect learning outcomes, such as intellectual variations and socio-economic status among students. To this end, the theory will be used in combination with the diffusion of innovations theory to study the application of CBT techniques in building English communication skills among rural secondary school students in Temeke, Tanzania.

2.1.2 Diffusion of Innovations Theory

Diffusion of Innovation (DOI) is a theory popularized by American communication theorist and sociologist, Everett Rogers, in 1962 that aims to explain how, why, and the rate at which a product, service, or process spreads through a population or social system (Rogers, 2020). In other words, the diffusion of innovation explains the rate at which new ideas and technology spread. The theory has been applied extensively in education research to explain the adoption and implementation of new teaching methods and innovations in schools (Faisal & Idris, 2020; Pinho *et al*., 2021) The theory can be used to examine the determinants of educational reform adoption and the process of diffusion across schools and teachers. The theory offers a general framework for the adoption process that captures the adoption determinants like channels of communication, attributes of innovations, and attributes of adopters. In the present study, theory will be employed to analyze the determinants of the adoption and implementation of CBT interventions in rural secondary schools in Temeke and to identify the barriers that limit or delay their adoption in diverse settings. However, the limitation is that it has the tendency to oversimplify the complexity of educational change processes, particularly in heterogeneous and resource-scarce settings where multiple factors interplay to influence adoption decisions. As such, it will be complemented by the social learning theory in the present study.

2.2 Empirical Review

Previous studies on CBT and CBC in East Africa provide useful information on variables influencing successful curriculum implementation, and reveal gaps this study addresses. Suleiman (2020) examined secondary science teachers in Tanzania and revealed a large discrepancy between the intended and enacted curriculum. Teachers faced competing curricular ambitions, pressures from school administration, and contextual issues, which limited their abilities to implement CBT successfully. This is in line with the current study in highlighting the importance of teacher preparation and institutional support key variables in understanding the challenges of improving English communication through CBT in Temeke Municipality. However, Suleiman's study was limited to science subjects, and there is a lacuna as regards the teaching of English language, an aspect the current research focuses on.

Mlenge (2024) examined the supervision practices of headteachers in Bagamoyo District and determined that practices such as in-service training, provision of teaching and learning materials, provision of a conducive classroom environment, and improving school-community relationships were crucial to carry out CBC. Despite the existence of these practices, teachers' low knowledge, competencies, and classroom overcrowding influenced the full implementation of competency-based approaches. This study informs the current study because it brings out the contribution of supervision and support in facilitating CBT. However, Mlenge's study was conducted in primary schools and does not cover secondary school teachers' experiences or how they can facilitate students' English communication skills in an urban area, a gap addressed by this study.

Furthermore, Makokha (2024) investigated teacher preparedness for CBC in junior secondary schools in Kenya and concluded that most of the teachers lacked proper training and ICT competencies, which hindered effective application of competency-based approaches. Mwakabenga and Paine (2023) clarified that professional learning communities in secondary schools in Tanzania were not well exploited, entrenching traditional, examination-oriented teaching rather than active, competency-based learning. Kiggundu *et al*. (2025) found that competency-based assessment enhances student engagement and critical thinking but is impeded by unclear assessment standards, few resources, and inadequate teacher support. Cumulatively, these studies point to the necessity of teacher training,

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professional support, and adequate resources variables this study investigates in the urban Temeke Municipality context, where teachers are more likely to have access to training and resources compared to rural areas, but still face challenges in terms of large classes, limited technology, and lack of pedagogical support for CBT in the teaching of English as a subject.

Together, these studies present compelling evidence that CBT is capable of enhancing English language communication skills, provided that it is adequately supported by training and facilities. Nevertheless, there is an enormous gap within the Tanzanian context, especially in urban rural areas like Temeke, where resource constraints, high student-teacher ratios, and infrastructural limitations facilitate ineffectual application. Additionally, as previous studies identify those challenges, few have examined how social learning dynamics, teacher-student interactions, and peer learning impact CBT uptake in such settings. By using social learning theory (Bandura & Walters, 1977), this research fills the gap by examining how interactional and contextual variables affect the failure or success of CBT in enhancing English communication skills in rural Tanzanian secondary schools.

III. METHODOLOGY

3.1 Research Paradigm

This research employed a pragmatic research paradigm that brings together positivist and interpretivism orientations. This allowed a mixed-methods research approach to be adopted. The pragmatic paradigm was chosen for this research as it allowed the researcher to blend qualitative and quantitative methods for a comprehensive overview of the issues in the implementation of CBT pedagogical approaches to English communication improvement. This paradigm was concerned with pragmatic solutions through its consideration of both measurable data and participants' experiences, for an equilibrium analysis of the challenges affecting CBT implementation in Temeke Municipality secondary schools.

3.2 Research Approach

In this study, a mixed-methods research approach was employed, wherein both qualitative and quantitative methods were employed to examine the challenges of CBT pedagogical approaches to improve English communication in Temeke Municipality secondary schools. The mixed-methods design was appropriate as it facilitated a comprehensive understanding of the issue through the combination of numerical data and dense descriptions of the participants' experiences (Almeida, 2018; Baran, 2022). The quantitative strand involved the use of structured questionnaires to collect statistical data on the factors affecting the implementation of CBT, while the qualitative strand included interviews and observations to collect in-depth information from the students and teachers. This combination enhanced the validity and reliability of the results by providing both measurable trends and explanatory context.

3.3 Research Design

A convergent parallel mixed-methods design was employed in this research, which allowed for the simultaneous collection and analysis of qualitative and quantitative data. This design was appropriate as it permitted the integration of numeric data from questionnaires and detailed data from interviews and observations to provide a comprehensive picture of the problems in the implementation of CBT pedagogical approaches to English communication improvement. The quantitative component involved the use of close-ended questionnaires to collect statistical data, while the qualitative component used interviews and classroom observations to explore teachers' and students' experiences. The findings of the two approaches were compared and combined in order to enhance the validity and richness of the study.

3.4 Study Area

The research was conducted in Temeke Municipality, Dar es Salaam Region, Tanzania. Temeke was chosen as the study area because it is a heterogeneous educational setting with public and private secondary schools, each with its own unique challenges in implementing CBT pedagogical approaches. The municipality has a large population with varying socioeconomic status, which provides a rich context for understanding the obstacles to English language instruction. Both peri-urban and urban schools were selected in Temeke Municipality in order to provide a broad spectrum of experiences in terms of resources, infrastructure, and teaching experience. The study aimed at a range of schools to obtain an image of the types of problems that could arise in varying settings, from schools with fewer resources to schools with better facilities. Schools of interest were schools with varying levels of experience in the implementation of CBT so that the findings would be relevant to a wide range of school settings in the municipality. By focusing on Temeke Municipality, the research aimed at determining how class size issues, teacher training, resource availability, and demographic factors of the students influence the uptake and success of CBT in improving secondary school students' English communication skills.

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3.5 Target Population

The population targeted by this study was secondary school teachers and students in private and public schools within Temeke Municipality. The study specifically aimed at English language teachers who had experience in the use of CBT pedagogical approaches in their classrooms. Teachers with at least one year of experience in using CBT approaches were selected to ensure they had first-hand information on the challenges and benefits of using this method in improving English communication. Aside from teachers, secondary school students who were studying English actively and exposed to CBT-based teaching of English language were also targeted by the study.
Sample Size and Sampling Technique

3.6 Sample Size

The study targeted a sample of 100 secondary school teachers in Temeke Municipality. The teachers were targeted based on their involvement in the implementation of Competence-Based Training pedagogical approaches in the teaching of English language. The sample aimed at teachers with at least one year of experience in implementing CBT strategies so that they would have a real-world understanding of the issues as well as the possibilities inherent in its use. The sample size was chosen to provide a good representation of the opinions of teachers so that the study could gather sufficient information on barriers and enablers of effective CBT in secondary schools for improving English communication.

3.7 Sampling Techniques

In this research, the 100 secondary school teachers in Temeke Municipality were chosen by means of a stratified random sampling technique. Stratified sampling was appropriate as it ensured that different subgroups of teachers, based on years of experience and type of school (private or public), would be represented in the sample. The population of teachers was first stratified based on these factors, and a random sample was then drawn from within each subgroup so that all views concerned would be represented. Purposive sampling was also used to include teachers with at least one year of experience in using CBT in their English language classrooms. This approach ensured that the study included teachers who were experienced and had knowledge of CBT pedagogy. Both the stratified and purposive sampling ensured a representative and diverse sample of teachers, and this allowed the study to have access to detailed information on issues confronting the use of CBT in secondary schools.

3.8 Research Instruments and Data Collection Methods

The study employed questionnaires, interviews, and observation in an amalgamation as research tools to obtain quantitative and qualitative data for a holistic representation of the challenges faced by teachers while implementing CBT to promote English communication. Questionnaires were used in obtaining quantitative data from the 100 teachers who participated in the research. These questionnaires contained close-ended questions that asked for information regarding the preparedness and readiness of teachers to implement CBT, and the availability and adequacy of the teaching materials. The questionnaire was designed to determine the problems teachers encountered in implementing the application of CBT pedagogy strategies and how these problems influenced the effectiveness of teaching English as a subject. This instrument was designed to generate quantifiable information that could be analyzed for patterns and trends in the use of CBT. The surveys were supplemented by semi-structured interviews with a subset of the instructors in order to gain in-depth, qualitative data.

The interviews allowed the experience of the teachers to be explored in finer detail, understanding the specific problems they experienced when implementing CBT, and their view of its effectiveness to improve English communication. The semi-structured nature of the interviews was flexible in the way that it enabled the researcher to probe more deeply in cases where issues were raised during the interview and cover areas not covered by the questionnaires. The interviews were tape-recorded (after gainful consent from participants) and transcribed for close inspection. Besides this, the classrooms were observed so that one could observe how CBT was being implemented into actual classrooms. The researcher used an observation checklist to document pedagogic approaches utilized, classroom talk, and utilization of materials in instruction of English.

These observations placed in context the data that had been gathered with questionnaires and interviews by indicating actual-life examples of CBT in application. Observations additionally indicated in which areas the experiences as described by the teachers differed from what occurred actually in classrooms. Using these numerous methods of data collection facilitated triangulation, which rendered the findings dependable and comprehensive. Through the combination of quantitative data from questionnaires and qualitative data from interviews and observations, the research was able to provide a balanced depiction of the difficulties of applying CBT in secondary schools and how it affects improving English communication skills.

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3.9 Data Analysis Plan

Data collected through questionnaires, interviews, and classroom observation were both qualitatively and quantitatively analyzed in order to get a thorough description of the challenges faced by teachers in implementing CBT for English communication. Quantitative data, i.e., data through questionnaires, were calculated using descriptive statistics. This study was aimed at describing sample population characteristics like the level of training between the teachers, inclination to employ CBT, and provision of resources for effective teaching of English. The information was systematically and clearly presented using descriptive statistics like frequency distributions, percentage, and mean scores and their views about CBT's potential for promoting English communication. SPSS software was utilized to analyze the data and identify the emerging trends or patterns.

For qualitative data, evidence gathered through interviews and observations in the classroom was analyzed using thematic analysis. Interview data were coded and transcribed, and field observation notes were reviewed to ascertain the themes emerging that relate to teacher training, resource availability, and challenges in implementing CBT. Through the coding of data into themes, which allowed the researcher to form themes that made the understanding of teachers' experience with CBT in improving English communication possible. This qualitative data was manually interpreted or with the assistance of qualitative data analysis software NVivo to identify overarching themes and sub-themes. Data triangulation was finally used to increase study validity. This was achieved through the comparison and cross-validation of results from multiple data sources to ensure conclusions were reliable. For example, quantitative information gathered through the questionnaires was cross-referenced with qualitative data from interviews and observations to validate the findings. Through both qualitative and quantitative information, the study aimed at portraying a clearer and better view of the problems in the use of CBT and its contribution to the improvement of English communication in Temeke Municipality secondary schools.

IV. FINDINGS & DISCUSSIONS

4.1 Respondent’s Profiles

This section presents the findings of the study on establishing the challenges of CBT pedagogical approaches in improving English communication in secondary schools in Tanzania's Temeke Municipality. The findings of the study are presented by specific study objectives, in relation to readiness by teachers to implement CBT approaches and resources for teaching and learning. The results are based on evidence collected from a survey, interviews, and classroom observation that were conducted among teachers and school administrators. The chapter is sectioned into two based on the specific goals of the research. The first section addresses the extent to which teachers are trained and empowered to implement CBT pedagogic approaches in teaching English language. The second segment discusses availability and adequacy of instruction and learning materials necessary to introduce CBT feasibly. The results provide a comprehensive picture of teachers' difficulties in integrating CBT strategies into classroom instruction and the implications for improving English communication skills of secondary school students in the study area. This part provides the background profile of the respondents based on age, sex, and years of experience in teaching, academic qualification, and CBT training. The data collected provided a general picture of the respondents' characteristics, which are essential in determining the study context and in interpreting the findings.

4.1.1 Age of Respondents

The distribution by age of the participants indicated a comparatively youthful teaching population. A total of 15 (50%) of the respondents were aged 30 to 40 years, 9 (30%) were 41 to 50 years, while 6 (20%) were more than 50 years old. Most teachers were in the 30 to 40 age group, indicating a vibrant middle-age professional population actively involved in teaching practices.

4.1.2 Gender of Respondents

The gender split reported reasonably balanced splits, comprising 16 (53%) female teachers and 14 (47%) male teachers. This balance afforded a diverse range of opinions regarding the advantages and disadvantages of applying CBT in class with no evident gender-related differences recorded in their responses.

4.1.3 Years of Teaching Experience

The subjects of the study varied in terms of teaching experience, with most of them having between 5 to 10 years of experience (12 teachers, 40%). This was closely followed by 8 teachers (27%) with 1 to 4 years of experience, 6 teachers (20%) with 11 to 15 years of experience, and 4 teachers (13%) with over 15 years of experience. The varying levels of experience provided a broad perspective of the use of CBT and its perceived effectiveness in enhancing English communication.

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4.1.4 Academic Qualifications

The academic levels of the respondents were from diploma level to degree level in education. The majority of them, 18 teachers (60%), were bachelor degree holders in education, followed by 8 teachers (27%) who were diploma holders in education, and 4 teachers (13%) who were postgraduate qualifiers in education or English language teaching. The data showed that the teachers had a quite good academic qualification, and this should impact their teaching efficacy and understanding of CBT principles.

4.1.5 Training in Competency-Based Teaching (CBT)

With respect to training in CBT, 20 teachers (67%) mentioned they had received formal training in Competency-Based Teaching strategies, i.e., workshops or in-service programs. However, the duration of training varied as 12 teachers (40%) claimed that their training was of limited duration, lasting only 1 to 2 days. Only 8 teachers (27%) had received more comprehensive training programs lasting a maximum of 3 weeks. The remaining 10 teachers (33%) had not received any CBT training, yet they had some experience in CBT through school-level programs or self-study. Such variation in training experience was a key determinant of the evaluation of teachers' preparedness and competence to implement CBT.

Table 1

Profile of the Respondents

Category	Frequency	Percentage
Age		
30-40 years	50	50.0
41-50 years	30	30.0
Above 50 years	20	20.0
Gender		
Female	53	53.0
Male	46	46.0
Experience in Teaching		
1-4 years' experience	26	26.0
5-10 years' experience	40	40.0
11-15 years' experience	20	20.0
Above 15 years' experience	13	13.0
Educational Qualification		
Bachelor's degree	60	60.0
Diploma	26	26.0
Postgraduate	13	13.0
Training in Competency-Based Teaching		
Trained in CBT	66	66.0
Not trained in CBT	33	33.0

4.2 Teachers' Training and Preparedness for Implementing CBT Pedagogical Approaches in English Language Instruction

This sub-theme accounts for the level of training and preparedness of teachers to implement Competency-Based Teaching (CBT) pedagogical approaches in English instruction within secondary schools in Temeke Municipality. The study target is to explore how training and preparedness (independent variables) affect the implementation of CBT and thus learners' improved English communication competence (dependent variable).

4.2.1 Competency-Based Teaching (CBT) Training

Out of the 100 teachers surveyed, 66% reported having had formal CBT training and 34% had not. The results reveal a direct relationship between the nature and scope of training and teachers' ability to apply CBT in ways that support students' communication. Among the beneficiaries of large-scale training that lasted more than one week, teachers reported confidence in designing student-centered lessons whereby students are actively involved in speaking and writing English. One teacher explained:

> "*The training was quite helpful to me. It was not pure theory but also included some classroom simulations at the practical level. We were taught how to design lessons in which students are the bosses, where they discuss and demonstrate their competencies in English. Since then, I have noticed that students are more confident in speaking, and their writing is better organized." If it weren't for this training, I don't think I*

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would have known how to make the class more interactive and communication-based." (FGD, 12th March 2025).

In contrast, however, teachers who had received only short 1–2 day sessions (26%) stated that while they had received a general overview of CBT, the superficiality of it meant that they found it hard to apply it practically. As one of them explained:

> *"The workshop I attended was much too short to understand the scope of CBT." We were taught the principles, but there was no chance to practice or to learn how to implement the ideas in real classroom settings. When I later tried to apply CBT techniques, I was left without the tools and examples that I needed to guide students through communication-based activities. Thus, even though I am aware of the principles, I still fall back on traditional teaching, which is not helping my students learn English speaking and writing as CBT is designed to."* (FGD, 13th March 2025).

More troubling, the 34% of teachers who received no CBT training relied on self-study and peer observation, which they admitted did not equip them to lead student-centered communication activities. One teacher elaborated:

> *"I have received no training in CBT, but I try to learn through reading books and also observing colleagues who were trained. The challenge is that with no supervision, I don't know if I am applying the approach effectively." For example, I am aware that I should allow students to practice English by creating group work, but I am not always sure how to design tasks to push them to use the language effectively. This makes it hard for me to help students build communication, especially speaking and writing, which are the core components of the English syllabus."* (FGD, 14th March 2025).

These findings show that training quality and extent directly affect teachers' capacity to utilize CBT in the development of students' communication. Comprehensive training equips teachers with capacity that fosters English speaking and writing, while a lack of or inadequate training leaves teachers in the state of struggling, thereby inhibiting students' communication development.

4.2.2 Preparedness to Implement CBT

Findings also reveal that teachers' readiness significantly affects how CBT is actualized in classroom practices to improve communication skills. Of the respondents, 72% reported being moderately or well-prepared to implement CBT strategies in the teaching of English as a language. These educators incorporated group discussion, project-based learning, and performance-based evaluation, all of which are imperative in developing students' speaking, listening, and writing abilities. As one of the teachers pointed out:

> *"Although there are limitations of big classes and limited textbooks, I do think I am adequately prepared to try and make my lessons interactive. I frequently have the student's debate, role play, and conduct group projects where they must use English in real-life situations. For instance, I had them enact a market exchange in English once, and it taught them how to negotiate. Though it is not easy, I believe that with these strategies, the students have greater opportunities for communication compared to when I taught only with the assistance of lectures and grammar exercises."* (FGD, 10th April 2025).

On the other hand, 28% of the teachers who indicated poor preparedness cited lack of training, insufficient resources, and overcrowded classrooms. These teachers acknowledged familiarity with CBT principles but could not apply them in manners that actively engaged students in communication activities. One teacher commented with emphasis:

> *"I know the principles of competency-based teaching, but in practice it is very difficult for me to use it effectively. My class has more than 70 students, and with limited teaching resources, I often find it hard to carry out interactive tasks. Even if I try to, I am not in a position to give one-to-one feedback to students, which is crucial for their communication skills development. I feel frustrated sometimes because I know the methods can work, yet without support and continuous training, I do not feel sufficiently empowered to make them work in such an environment."* (FGD, 15th April 2025).

A majority of the educators stressed the necessity for ongoing professional development to increase their competencies, the implication being that long-term support is fundamental in bridging preparedness and improved student communication outcomes. As one educator commented:

> *"I think once-off workshops are not sufficient. Teachers require ongoing support and refresher courses if we are to become full implementers of CBT. Personally, I feel that with more training sessions, follow-up workshops, and support from experienced trainers, I would be more confident to apply methods that directly help students improve their English speaking, listening, and writing skills. CBT does not just about know the theory, it is about being able to practice and refine those skills in real classroom situations and for that, and we need continuous training and support."* (FGD, 13th April 2025).

These findings imply that teacher preparedness is the missing link between training and improved student communication outcomes. Teachers who feel well prepared create interactive, student-centered activities that promote

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English communication, whereas low preparedness caused by poor training, a lack of resources, or overcrowded classrooms reduces CBT's effectiveness in improving communication competencies.

Table 2

Teachers' Training and Preparedness for Implementing CBT Pedagogical Approaches in English Language Instruction

Category	Frequency	Percentage (%)
Teachers who received formal training in CBT	66	66
- Comprehensive Training (More than 1 week)	40	40
- Brief Training (1-2 days)	26	26
Teachers who did not receive formal CBT training	34	34
Teachers who feel moderately/well-prepared to implement CBT	72	72
Teachers who feel inadequately prepared to implement CBT	28	28

4.3 The Availability and Adequacy of Teaching and Learning Resources Necessary for Effective Implementation of CBT in Improving English Communication

The findings on the availability and adequacy of teaching and learning materials to support the effective use of Competency-Based Teaching (CBT) in improving English communication within Temeke Municipality reveal a series of challenges that confront teachers. In conclusion, the study finds that teachers in Temeke Municipality face significant challenges with respect to the availability and adequacy of the materials essential for the effective utilization of CBT. The unavailability of materials of instruction, technical equipment, staff development experience, and time for planning all form hindrances to the success of CBT in improving English communication as displayed in the Table 3.

The mean of 2.45 for the availability of instructional resources (such as textbooks and materials) is what the researcher discovered, which signifies that most teachers disagree with the assertion that they have sufficient access to the requisite resources. This translates to a clear shortage in the most critical resources needed to manage CBT successfully. Teachers typically require diverse materials like textbooks, exercise books, and other materials in a bid to engage learners in learning processes leading to competence-building. The finding regarding the adequacy of instructional materials (e.g., workbooks, handouts), with a mean of 2.55, also supports the fact that teachers do not have the inputs required to effectively execute CBT. As CBT involves active learning and practice exercises, the inadequacy of sufficient workbooks and other instructional materials can severely impede its efficacy. Contrarily, technology access, with a mean of 2.30, is another significant issue.

Its low rating shows that it is difficult for instructors to integrate technology into instruction, an issue in the current education system where technologies are important in providing teaching with dynamism and interactivity. Temeke Municipality instructors seem to face challenges in obtaining essential technology such as computers, projectors, and other electronic gadgets that may be used for CBT practices. Nevertheless, positively put, an average score of 2.80 for the classroom environment, which includes the physical layout and floor space, reflects that the majority of instructors view the classroom environment as reasonably suitable for CBT implementation. But the score is still less than the midpoint, which means that while some classrooms facilitate active and student-centered instruction; most classrooms do not yet have the equipment to facilitate CBT practices. The lowest mean score of 1.90 in the finding is most troubling. Teachers strongly disagree with being given adequate opportunities for training in CBT practices.

Such a difference in professional development was a clear indicator of one of the key challenges facing the preparation of teachers with the appropriate skills and knowledge to be able to implement CBT effectively. The observation also uncovers that, the amount of time devoted to planning lessons, which has a mean score of 3.00, suggests that teachers are neutral in the time devoted to planning and preparing CBT lessons. This finding suggests that while some instructors may think they have enough time to prepare; they are numerous and time-limited. Further, the findings suggest that while teachers realize that feedback and support are crucial in the implementation of CBT, with a mean score of 2.60, they do not necessarily think that they receive proper help on the same. Ongoing direction and feedback are required for instructors to hone their practices, especially when transitioning into new teaching methodologies like CBT. Led by school administration, the average score of 2.75 further signifies the presence of some involvement of school administrators in supporting CBT but not enough to fully facilitate its adoption. Active involvement of leadership is crucial in ensuring that change is facilitated and that there are the resources and policies to support teachers. Besides, the curriculum support for integration of CBT, with a mean rating of 3.10, also displays a more favorable perception, with teachers somewhat disagreeing that the curriculum does support integration of CBT.

There are still, however, some things that need to be enhanced in aligning the curriculum to the foundations of CBT. More comprehensive and coherent curriculum could better equip the teachers to make optimal use of CBT and engage the students in active learning. Last but not least, the adequacy of resources to assess and evaluate students' performance under CBT with a mean score of 2.50 explains that teachers in general feel that the resource for assessment is lacking. Assessment is one of the key components of CBT as it is focused on assessing students' capabilities through

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the application. Lack of appropriate assessment tools implies that educators cannot be certain about whether students are making progress, and this is responsible for the inefficiency of CBT. The 1.18 standard deviation means that although there are a few teachers who have assessment tools, they are not many.

Table 3

The Availability and Adequacy of Teaching and Learning Resources Necessary for Effective Implementation of CBT in Improving English Communication

Item	Mean	STD
Teachers have access to sufficient teaching resources (e.g., textbooks, materials)	2.45	1.2300
Teaching materials (e.g., workbooks, handouts) are adequate for effective CBT	2.55	1.2000
Teachers have access to technology (e.g., computers, projectors) for CBT implementation	2.3	1.1900
Classroom environment supports the implementation of CBT (space, seating, layout)	2.8	1.2500
There are sufficient professional development opportunities to enhance CBT implementation	1.9	1.1100
There is adequate time allocated for the planning and preparation of CBT lessons	3	1.3000
Teachers receive regular feedback and support in the implementation of CBT	2.6	1.2100
School leadership is actively involved in supporting the implementation of CBT	2.75	1.2200
The curriculum supports the integration of CBT effectively in English language teaching	3.1	1.1500
There are sufficient resources for assessment and evaluation of student performance in CBT	2.5	1.1800

4.3 Discussion

4.3.1 Teachers' Training and Preparedness for Implementing CBT Pedagogical Approaches in English Language Instruction

The study indicates that teacher preparedness in Temeke Municipality is a significant contributor to the effective use of CBT. The majority of the teachers reported insufficient training, and a few of them only received comprehensive, functional professional development. This insufficiency inhibits them from adopting learner-centered approaches to teaching, including collaborative learning, task-based teaching, and performance-based assessment. This implies that the inadequate teacher training not only limits classroom use of CBT practices but also bars learning of essential English communication skills for students. Undertrained teachers might fall back on traditional teacher-centered approaches, opposite the learner-centered tradition of CBT. In Temeke Municipality, this means that learning outcomes of students' English communication skills are strongly correlated with how prepared the teachers are as individuals.

Furthermore, training quality and consistency varied significantly among teachers. Some of them received comprehensive workshops that provided the theoretical foundations and hands-on approaches, while others were introduced superficially or momentarily. The difference leads to inequalities in classroom practices that yield uneven application of CBT in schools. The results support Mulenga and Kabombwe (2019), who confirmed that in Tanzania, initial teacher training cannot equip teachers with the skills necessary to successfully implement learner-centered pedagogies. Similarly, Andrew (2021) posited that the urban area teachers are likely to have better access to professional development compared to rural counterparts and that this fuels disparities in teaching quality. In Temeke Municipality, this means that students' learning outcomes for English communication skills are closely associated with the individual readiness of teachers.

Finally, continuous professional development was a key essential aspect of sustaining CBT implementation. The study shows that solitary training is not sufficient for teachers to perform at their best when using competency-based approaches. Repeated mentoring, renewal courses, and assistance are required for teachers to advance their teaching plans and relate them to classroom situations. This is consistent with Wenga and Malingumu (2024) who further emphasized that ongoing professional development boosts the confidence and capability of teachers in using CBT, in the end, improving the learning outcome of students. Closing the gaps in teacher training and enabling ongoing professional development are central to raising the use of CBT and advancing students' English communication skills.

4.3.2 The Availability and Adequacy of Teaching and Learning Resources Necessary for Effective Implementation of CBT in Improving English Communication

The study found that availability of teaching and learning materials is one of the most important determinants of the effectiveness of CBT in Temeke Municipality. Teachers indicated insufficient access to textbooks, workbooks, multimedia materials, and electronic materials as a necessity for facilitating student-centered instruction. Lack of resources constrains teachers' ability to prepare interactive exercises and activities that are integral components of competency-based instruction. The implications are clear: with inadequate materials, teachers are forced to use outdated or provisional texts, thus limiting opportunities for students to learn English communication skills through real-world applications.

Moreover, application of technology in teaching at the school level is still wanting. Despite existing schools having computers, projectors, or other computerized devices, these are either lacking or unevenly allocated. The findings

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are in line with Mlenge (2024), who established that poor technological infrastructure in Tanzanian schools influences, the ability of teachers to adopt participatory and interactive pedagogical approaches. Without technology, the teachers are unable to fully incorporate modern CBT methods that are multimedia and internet-based in order to facilitate language acquisition, and their classrooms become less engaging. This technology deficit directly affects the ability of students to practice and improve their English communication skills.

Finally, the physical classroom environment was also found to affect CBT implementation. The majority of classrooms in Temeke Municipality are made up of fixed seating arrangements and small spaces for group work, which inhibits collaborative learning and practical exercises. These findings are consistent with Ndomondo (2024) and Rogers (2020), who established that classroom design directly influences the application of learner-centered pedagogic practices. The inability to facilitate group interaction or interactive sessions hinders the development of students' practical English communication skills. Sufficient teaching materials, technological support, and cozy classrooms must be provided to enable proper execution of CBT and improvement of students' English communication skills.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The aim of this study was to assess the challenges of implementing Competency-Based Training pedagogical approaches in promoting English communication in secondary schools in Temeke Municipality, Tanzania. The findings of the study concluded several conclusions. The first one was that the preparedness and training of teachers proved to be the biggest challenges. Most teachers were not well prepared and equipped to implement CBT effectively. Even though CBT had been brought into Tanzanian policy in education, the lack of training programs and continuous professional development prevented teachers from adopting the use of CBT techniques in class. Teachers were thus unable to bring competency-based techniques into classrooms, detracting from the overall impact on learners' English communication skills.

Finally, the study found a crucial lack of instructional and learning materials necessary for proper implementation of CBT. Teachers lacked proper access to fundamental materials like textbooks, multimedia materials, and technology, which are necessary for creating an energetic and interactive classroom atmosphere. Absence of these materials, especially in rural areas, also hindered the effective implementation of CBT, rendering it challenging for teachers to deliver quality English education. Furthermore, environmental conditions in the classrooms were also not favorable to effectively implement CBT. The majority of the classrooms were designed in a traditional pattern, with the fixed seating hampering collaboration and interactive practices, which are central to the competency-based method. Lack of flexible classrooms with inadequate infrastructure added to this by creating an inappropriate learning environment for the incorporation of CBT practices altogether.

5.2 Recommendations

Based on the research findings, several recommendations are proposed to strengthen enactment of Competency-Based Teaching (CBT) in English teaching and enhancing communication skills among students. First and foremost, teacher training and professional development must be enhanced. Teachers remain the principal implementers of CBT; thus, equipping them with adequate knowledge and skills is imperative. Regular and comprehensive training programs must be established not only to introduce teachers to theoretical frameworks of competency-based methodologies but also to acquaint them with hands-on techniques that can be applied in classrooms. Training programs should be refreshed from time to time in reaction to shifting pedagogical tides as well as to changing English communication imperatives. Additionally, regular mentorship and peer-learning sessions must be established to enable teachers to share experiences and enhance practice.

The second major recommendation is about increasing the availability of teaching and learning resources. Effective CBT usage requires that teachers and students have enough teaching materials, like textbooks, computer software, and multimedia resources. Nevertheless, the majority of Tanzania's schools face serious shortages in resources, limiting the effectiveness of student-centered and interactive approaches. To close this gap, the education stakeholders and government would have to prioritize the equitable allocation of resources, particularly to under-resourced schools. Investment in technology infrastructure like the internet, projectors, and language learning software would facilitate interactive and student-centered learning environments. Availability of these resources is vital to equip the teachers to diversify their styles of teaching and engage the students in more meaningful learning experiences.

The study further recommends changing classroom design to be in alignment with CBT. Traditional classroom design, centered on teacher-student interaction, is not conducive to team work or interactive learning. Schools should therefore employ flexible designs that incorporate movable furniture, ample space for discussion, and provision for activity-based learning. This reorganization of learning spaces will be conducive to a space that fosters student participation, peer-to-peer interaction, and problem-solving that is at the core of competency-based education. This institutional and policy backing must persist concurrently, though. The government needs to provide a robust policy

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climate that guarantees adequate funding for teacher training, procurement of resources, and infrastructure construction for CBT to be sustained. Effective monitoring and evaluation mechanisms must also be put in place to track implementation milestones and act in a timely manner where bottlenecks are experienced. Lastly, effective participation from the community must be increased by incorporating parents, local governments, and non-governmental organizations into education interventions. Community participation would be able to mobilize additional resources, promote accountability, and ensure that CBT serves the greater educational interests of learners.

REFERENCES

Ahmad, I. S., & Khan, Z. J. Y. (2023). English language skills and becoming a global entrepreneur: Lessons for entrepreneurship education. *International Journal of Learning, Teaching and Educational Research, 22*(6), 195–211. https://doi.org/10.26803/ijlter.22.6.12

Almeida, F. (2018). Strategies to perform a mixed methods study. *European Journal of Education Studies, 5*(1), 137–151. https://oapub.org/edu/index.php/ejes/article/view/1957

Andrew, K. (2021). The role of competency-based curriculum on creation of employability skills in Tanzania (PhD thesis, The Open University of Tanzania). http://repository.out.ac.tz/id/eprint/3510

Ara, R. (2020). A foreign language or the second language: The future of English in Bangladesh. *International Journal of Language Education, 4*(1), 81–95. http://dx.doi.org/10.30870/jels.v10i1.31516

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall.

Baran, M. L. (2022). Mixed methods research design. In *Research anthology on innovative research methodologies and utilization across multiple disciplines* (pp. 312–333). IGI Global.

Barrett, A. M., Biseko, J. M., Clegg, J., Mbwafu, F. A., Ndabakurane, J. J., Sane, E., Wayimba, S. J., & Bowden, R. (2024). Language learning across transition in the language of learning and teaching: An analysis of the Tanzanian curriculum (Working paper 3). School of Education, University of Bristol. https://www.bristol.ac.uk/media-library/sites/education/documents/bristol-working-papers-in-education/Language%20learning%20across%20transition%20in%20the%20language%20of%20learning%20and%20teaching_Barrett%202024.pdf

Curtis, A., & Romney, M. (2019). *Color, race, and English language teaching: Shades of meaning*. Routledge.

Ehtsham, M., Zeb, A., Alam, A., & Ahmad, S. (2023). Examining the impact of socioeconomic factors on English language proficiency: A cross-cultural analysis. *Al-Mahdi Research Journal (MRJ), 5*(2), 126–140. https://doi.org/10.5005/jp-journals-10021-1104

Faisal, S. M., & Idris, S. (2020). Innovation factors influencing the supply chain technology (SCT) adoption: Diffusion of innovation theory. *International Journal of Social Science Research, 2*(2), 128–145. https://doi.org/10.54660/IJSSER.2023.2.1.143-155

Firmansyah, D., & Saepuloh, D. (2022). Social learning theory: Cognitive and behavioral approaches. *Jurnal Ilmiah Pendidikan Holistik (JIPH), 1*(3), 297–324.

Hickey, R. (2020). *English in multilingual South Africa: The linguistics of contact and change*. Cambridge University Press.

Ideh, A. E. (2019). English language in a Tanzanian university. *Covenant Journal of Language Studies, 7*(1), 21–31.

Ideh, A. E. (2021). Problem of English language proficiency in Tanzania schools: The causes and the way forward. *Language in India, 21*(6), 144–161. https://doi.org/10.4314/gjedr.v19i2.6

Jenkins, J., & Panero, S. M. (2024). *Global Englishes: A resource book for students*. Routledge.

Kangalawe, R. G. (2024). Structural and pedagogical factors facing the implementation of the national inclusive education strategy in primary schools in Tanzania (Master's thesis, University of Dodoma, Tanzania).

Kiggundu, M. M., Kalule, J., & Batiibwe, M. S. (2025). An analysis of teachers' insights on assessment approaches in the implementation of a competency-based curriculum for Islamic religious education in secondary schools in Wakiso District–Uganda. *East African Journal of Education Studies, 8*(1), 362–374. https://doi.org/10.37284/eajes.8.1.2693

Kurniawan, I. W. A. (2024). English language and its importance as global communication. *Samā Jiva Jnānam: International Journal of Social Studies, 2*(1), 51–57.

Makokha, R. F. (2024). Assessment of the teacher preparedness on competency-based curriculum performance in public junior secondary schools in Makindu Sub County, Makueni County, Kenya (PhD thesis, KCA University). http://41.89.49.50:8080/handle/123456789/1586

Malima, M., Mtani, B., & Ngowi, A. (2021). Analysis of the English language test competencies and its usefulness: A case of National Examination Council of Tanzania (NECTA). *Journal of Co-Operative and Business Studies (JCBS), 4*(2), 34–39. https://doi.org/10.2023/jcbs.v4i2.99

Maluleke, M. J. (2019). Using code-switching as an empowerment strategy in teaching mathematics to learners with limited proficiency in English in South African schools. *South African Journal of Education, 39*(3), 23–29.

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Mazrui, A. A. (2019). *The political sociology of English language: An African perspective* (Vol. 7). Walter de Gruyter GmbH & Co KG. https://doi.org/10.1525/AA

Mlenge, B. (2024). Exploring head teachers' practices in supervising implementation of competence based curriculum in public primary schools in Bagamoyo District-Tanzania (Master's thesis, University of Dodoma, Tanzania). https://search.proquest.com/openview/10daff3ec208a60e726922d29dbf7e82/1?pq-origsite=gscholar&cbl=2026366&diss=y

Msamba, E. M., Msuya, E. A., & Anangisye, W. A. (2023). In-service training for improving the implementation of competency-based curriculum in English foreign language teaching: Is planning effective? *Quality Assurance in Education, 31*(4), 570–585. https://doi.org/10.1108/QAE-02-2023-0036

Mufwene, S. S., Rickford, J. R., Bailey, G., & Baugh, J. (2021). *African-American English: Structure, history, and use*. Routledge.

Mulenga, I. M., & Kabombwe, Y. M. (2019). A competency-based curriculum for Zambian primary and secondary schools: Learning from theory and some countries around the world. https://dspace.unza.zm/handle/123456789/6571

Mwakabenga, R. J., & Paine, L. (2023). The potential of professional learning communities for competence-based teaching in Tanzanian secondary schools. *Papers in Education and Development, 41*(2), 23–29. https://brill.com/view/journals/ped/ped-overview.xml

Mwalongo, L. J. (2025). Enhancing English language skills among female science students in Tanzania: Insights from the Special Foundation Programme. *Journal of Linguistics, Literary and Communication Studies, 4*(2), 51–61. https://doi.org/10.58721/jllcs.v4i2.1140

Mwamakula, A. G., & Magashi, S. (2023). Second language learning for sustainable development: Barriers for learners in rural communities. *Journal of Issues and Practice in Education, 15*(2). https://doi.org/10.61538/jipe.v15i2.1391

Ndomondo, E. (2024). Promoting history subject skills through competency-based assessment in Tanzania rural secondary schools: Teachers' understanding and practices. *Social Sciences & Humanities Open, 9*, 100876.

Nyamubi, G. J. (2019). Socio-economic status as determinants of students' performance in English language in secondary schools in Tanzania. *Education Journal, 8*(3), 110–119. https://doi.org/10.11648/j.edu.20190803.14

Pinho, C., Franco, M., & Mendes, L. (2021). Application of innovation diffusion theory to the E-learning process: Higher education context. *Education and Information Technologies, 26*(1), 421–440.

Rao, P. S. (2019). The role of English as a global language. *Research Journal of English, 4*(1), 65–79.

Roberts, N., & Mort, T. (2023). Designing an English language and literacies knowledge and skills test for initial teacher education students in South Africa. *Journal of Education (University of KwaZulu-Natal), 90*, 32–48. http://journals.ukzn.ac.za/index.php/joe

Rogers, E. M. (2020). *Diffusion of innovations*. Free Press.

Saka, N. T. (2025). Social learning theory. In *Exploring adult education through learning theory* (pp. 135–162). IGI Global. https://www.igi-global.com/chapter/social-learning-theory/361638

Senyagwa, N. A. (2021). The challenges of teaching, and learning in large class size in public primary schools: The case of Ilala Municipality-Tanzania (PhD thesis, The Open University of Tanzania). http://repository.out.ac.tz/id/eprint/3377

Suleiman, M. M. (2020). Curriculum reform and implementation: Secondary science teachers' responses to a competency-based curriculum in Tanzania (PhD thesis, University of Leeds). https://etheses.whiterose.ac.uk/id/eprint/27317/

Sung-Yul Park, J. (2021). Konglish as cultural practice: Reconsidering the English language in South Korea. *International Journal of TESOL Studies, 3*(3), 12–19. https://doi.org/10.46451/ijts.2021.10.06

Terasawa, T. (2024). Relationship between English proficiency and socioeconomic status in Asia: Quantitative cross-national analysis. *World Englishes, 2024*, 1–44. https://doi.org/10.1111/weng.12705

wa Thiong'o, N. (2023). The language of African literature. In *Postcolonialism* (pp. 514–540). Routledge. https://api.taylorfrancis.com/content/chapters/edit/download?identifierName=doi&identifierValue=10.4324/9781003101413-7&type=chapterpdf

Wenga, D. M., & Malingumu, W. S. (2024). College managerial practices for promoting English language teaching and learning in Tanzania: A case study of Grade 'A' public teachers' training colleges. *Pan-African Journal of Business Management, 8*(1), 144–178. https://doi.org/10.61538/pajbm.v9i1.1638

Winaldo, M. D., & Oktaviani, L. (2022). Influence of video games on the acquisition of the English language. *Journal of English Language Teaching and Learning, 3*(2), 21–26. https://doi.org/10.33365/jeltl.v3i2.1953

Zeller, J., & Posel, D. (2020). Language use and language shift in post-apartheid South Africa. In R. Hickey (Ed.), *English in multilingual South Africa: The linguistics of contact and change* (Studies in English Language, pp. 288–309). Cambridge University Press. https://doi.org/10.1017/9781108340892.014

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CRB integration and non-performing loan risk at platinum credit limited, Dar es Salaam, Tanzania

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ABSTRACT

This business case focuses on the integration of Credit Reference Bureau (CRB) systems within Platinum Credit Limited, one of the leading microfinance institutions in Tanzania, and their effectiveness in tackling the ongoing challenge of non-performing loans (NPLs). Platinum Credit Limited found itself at a strategic crossroads on the potential benefits of the credit reference bureau services versus the impact of CRB on mitigating the risk of the non-performing loans. This dilemma required a strategic approach, as the problem mentioned lies not in the existence of CRB systems but in their partial or ineffective implementation at the institutional and employee level. The case utilises a descriptive approach supported by qualitative interviews and document analysis to identify institutional, technical, and behavioral obstacles to CRB usage. The case highlights the strategic decisions and interventions implemented by Platinum Credit Limited, grounded in theories such as information asymmetry, adverse selection, and moral hazard, supported by insights collected from the best practices of Tanzania's finance industry. Through qualitative data, including interviews and document analysis, this case study presents a detailed narrative of Platinum Credit Limited's efforts to navigate the challenge of non-performing loans (NPLs) through CRB integration. This case study provides essential strategies to address the integration of CRB in response to the rising of the non-performing loans (NPLs). The proposed solutions combine policy, technology, human capacity, regulatory cooperation, and borrower engagement. Each solution includes operational benefits with its estimated cost, clear justification, measurable targets, risks, and mitigations. The business case concludes that substantial CRB adoption should go beyond mere compliance to encompass operational integration and strategic alignment. In this way, Platinum Credit can considerably lower NPLs, improve credit quality, and secure sustainable growth within a competitive financial market.

Keywords: Credit Risk, Credit Assessment, Credit Reference Bureau (CRB), Non-Performing Loan (NPL)

I. INTRODUCTION

Global technological development has become one of the most important strategic aspects of an organization's growth (Serrat, 2021). The financial sector's departments used the conventional paper-based system to document and share borrower credit data before the advent of electronic technology (Ibrahim, 2013). Much as the paper-based system served its purpose, it required no system integration but was vulnerable to several limitations, such as delayed access to credit information due to the need for thorough searching and information asymmetry (Muhanga & Haule, 2021). This called for information and communication technology experts to devise means of storing credit-related information systematically (Garavand et al., 2016). As a result, a variety of Credit Reference Bureau (CRB) systems mushroomed all over the world to ensure quality credit risk management (Auyo et al., 2023). Therefore, with technological advancement, a shift to electronic credit records management systems was inevitable (Serrat, 2021). A few decades ago, Garavand et al. (2016) introduced Credit Information Sharing (CIS) systems to enhance the availability of borrower credit history. Nowadays, the use of CRBs in microfinance institutions has increased by 40 percent globally (Abdirahman & Isaksson, 2024). Financial institutions use these systems to capture, process, store, retrieve, share, and present data for improved credit decision-making (Auyo et al., 2023).

As a result, financial institutions worldwide can share credit data more efficiently through integrated CRB systems, facilitating quicker access to critical borrower information and reducing credit risk exposure. Good financial health among individuals in a community influences a high-quality population, which in turn triggers the country's economic development (Muhanga & Haule, 2021). This notion also aligns with the Sustainable Development Goals agenda, which emphasizes robust financial inclusion as an integral segment for development and a thriving community (Ibrahim, 2013). Credit Information Systems, in most cases, catalyze the effectiveness and efficiency of loan service delivery, which is crucial for reducing NPLs (Muhanga & Haule, 2021). The availability and effective use of CRBs provide the means to deliver credit services (Odiwuor et al., 2015). CRBs aim to provide high-quality services, timely and accurate information, and credit data sharing to help institutions mitigate adverse selection and moral hazard (Garavand et al., 2016). CRBs reduce risks, reduce lending errors, and improve credit portfolio quality (Auyo et al.,

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2023). Furthermore, it is linked to increased transparency and improved credit decision quality (Muhanga & Haule, 2021). Muhanga & Haule (2021) reported that CRBs significantly enhance loan service delivery in financial sectors. Muhanga & Haule (2021) also reported that CRBs influence the quality of credit services provided to the public. Due to its substantial impact on risk management, CRB adoption and use rapidly expanded in developed and developing nations, including Tanzania (Muhanga & Haule, 2021).

In Tanzania, Platinum Credit Limited (PCL) is a prominent microfinance institution, serving a large base of civil servants and private-sector employees. The company relies on the integrated Credit Risk Management System, which utilizes CRB data, to manage various functions, including loan appraisal, credit scoring, and portfolio monitoring (Mbizi, 2021). Researchers have documented the system's pivotal role in optimizing lending processes and improving financial outcomes (Mbizi, 2021). Despite CRB's significant role at PCL, the extent of its effective utilization in mitigating Non-Performing Loan (NPL) risk remains unclear. Previous research has largely focused on the technical and operational benefits of CRBs (Alkalah, 2016), but there is a notable gap in understanding the specific factors that influence its practical application and effectiveness, particularly in the context of large microfinance institutions like PCL in Tanzania. This study aims to address this gap by assessing the determinants of CRB utilization effectiveness at PCL. By exploring how behavioral, institutional, and technical factors impact CRB effectiveness, this research seeks to provide valuable insights into enhancing credit risk management and improving overall financial stability at PCL.

1.1 Statement of the Problem

The successful implementation and effective utilization of Credit Reference Bureau (CRB) systems are critical for improving credit risk management and reducing Non-Performing Loan (NPL) risk within financial institutions (Albokai et al., 2019). Loan officers, credit managers, and compliance staff must all use CRB data effectively, efficiently, and satisfactorily, which is an important determinant of these outcomes (Croll, 2009). Several challenges, including inadequate digital infrastructure, a lack of staff compliance, weak policy enforcement, and data quality problems, compromise the effective utilization of CRBs at Platinum Credit Limited (PCL) (Hamad, 2019). These challenges have resulted in suboptimal CRB utilization, negatively affecting loan portfolio quality and increasing the NPL ratio. Tanzanian financial institutions, such as PCL, have put a lot of money into automating credit processes and bringing Credit Information Sharing (CIS) into risk management (Muhanga & Haule, 2021). However, its effectiveness is still a problem. For instance, the company's NPL ratio rose to 11 percent in 2020 despite the mandatory use of CRB checks (Mbizi, 2021). This problem affects not only loan officers, who struggle with inefficient workflows and system errors, but also the financial health of the institution, which depends on the accuracy and timeliness of credit information. Previous research has primarily focused on aspects of CRBs such as information asymmetry, adverse selection, and financial inclusion (Middleton et al., 2013). However, there is a notable gap in the literature concerning the specific behavioral, institutional, and technical factors that influence CRB utilization in a microfinance setting like PCL. This study aims to fill this gap by investigating these factors. The goal is to understand how these factors either facilitate or hinder effective CRB use, ultimately providing actionable recommendations to enhance credit risk management and reduce NPLs at PCL.

1.2 Research Objective

i. To examine the influence of Behavioural factors on the effective utilization of CRB systems at PCL.
ii. To examine the influence of Institutional factors on the effective utilization of CRB systems at PCL.
iii. To examine the influence of technical factors on the effective utilization of CRB systems at PCL.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Behavioral, Institutional, and Technical-fit (BIT-Fit) model

The Behavioral, Institutional, and Technical-Fit (BIT-Fit) model, adapted from the original HOT-Fit model, offers a framework for evaluating how well human behavior, organizational structure, and technological factors align to enhance CRB system effectiveness and NPL mitigation (Erlirianto et al., 2015).

Behavioral factors focus on user attributes such as training, competency, satisfaction, and adherence to CRB protocols. Effective training improves loan officer skills and system usage, while high user satisfaction correlates with better CRB utilization (Erlirianto et al., 2015). Institutional factors include management support, allocated resources, and alignment of credit policies with CRB usage. Strong institutional support and proper policy enforcement are essential for successful system integration and compliance (Tarbox, 2014; Jackson & Allen, 2024). Technical factors encompass system functionality, integration with the Loan Origination System (LOS), technical issues, digital infrastructure, and data security measures. Reliable system performance, ease of integration, and robust data infrastructure are critical for effective credit checking (Khan et al., 2024; Daousis et al., 2024; Bevan, 1995; Mohdhar & Shaalan, 2021).

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In applying the BIT-Fit model, this study assessed the influence of behavioral, institutional, and technical factors on the effective utilization of the CRB system at Platinum Credit Limited and its impact on NPL mitigation. It evaluated behavioral factors through staff training and adherence, institutional factors by examining management support and procedural alignment, and technical factors by analysing system integration and data quality (Janota et al., 2022; Peña et al., 2024; Daousis et al., 2024). This approach aims to identify determinants of CRB effectiveness and provide insights into how these factors influence the quality of the loan portfolio (Good, 2015).

2.2 Empirical Review

Yusof et al. (2008) conducted a study to investigate how perceived usefulness and ease of use affect the adoption of Credit Information Sharing (CIS) systems. This study surveyed a sample of 150 credit professionals across various financial settings. The findings revealed that higher perceptions of usefulness (in reducing NPLs) and ease of use (in daily operations) were strongly associated with better CRB adoption. The research emphasizes the need for CRBs to be both valuable and user-friendly to enhance utilization. Another study by Vedel et al. (2012) investigated how positive perceptions among credit officers impact the utilization and integration of CRB systems at a microfinance institution in Tanzania. The study involved a sample of 200 loan officers and used a mixed-method approach, including surveys and interviews. The results indicated that positive perceptions among loan officers and administrative staff significantly facilitated CRB utilization and integration, leading to improved efficiency and reduced credit losses. The study recommends focussing on enhancing the perceived value of CRB systems through user-centred design. Using quantitative surveys with a sample size of 300 users across different financial facilities, Mohdhar and Shaalan (2021) assessed loan officer satisfaction and acceptance in CRB implementation. The findings of this study revealed that high levels of loan officer satisfaction and acceptance are crucial for successful CRB implementation. The study highlights the importance of incorporating user-centered design principles to improve usability and effectively meet user needs. Additionally, Hamad (2019) explored the importance of user-centred design for CRB system effectiveness. The study reviewed literature, included data from multiple case studies, and gathered feedback from over 100 financial professionals. According to researchers, user-centered design principles are critical for creating effective and user-friendly CRB systems. However, the studies examined did not discuss the impact of behavioral, technical, and institutional factors in a specific microfinance setting, particularly in a large regional player such as Platinum Credit Limited (PCL), on the use and implementation of these systems. This gap highlights the need to examine how behavioral, institutional, and technical factors influence CRB effectiveness in real-world lending operations. While Coiera's work emphasizes the value of user-centred design, it overlooks the complexities and challenges unique to large microfinance institutions like PCL, where diverse user needs, resource constraints, and varying levels of technological integration can significantly impact the effectiveness and NPL mitigation of CRB systems.

III METHODOLOGY

3.1 Research Design

The study used a mixed-method design, combining both quantitative and qualitative methods. We collected quantitative data through structured questionnaires to measure various aspects of CRB utilization among PCL staff and gathered qualitative data from semi-structured interviews to gain deeper insights into their experiences and perceptions regarding NPL risk and compliance. This combined approach allowed for a comprehensive analysis by integrating broad statistical trends with detailed personal experiences, enhancing the overall understanding of CRB effectiveness (Creswell & Plano Clark, 2018).

3.2 Population of the Study

The target population for this study was 1500 PCL employees involved in the loan lifecycle. The sample included loan officers, credit managers, IT support staff, and other administrative members. This diverse group helped ensure the findings could be applicable to similar microfinance organizations.

3.3 Sample Size

Using Yamane's formula with a 95% confidence level and a 5% margin of error, a sample size of 109 was determined from 1,500 staff members. This sample was representative of the population and included staff from various departments.

3.4 Sampling Technique

We used systematic random sampling to select participants. This involved choosing every 2nd staff member from a list to ensure a representative sample. This method was chosen to minimize bias and achieve a balanced representation.

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3.5 Data and Data Collection Methods

We collected data using two main methods: questionnaires and interviews. The questionnaire was composed of both open ended and five-point Likert scale questions to assess the impact of behavioral, technical, and institutional factors on the effectiveness of CRB utilization. In the questionnaire, different questions represented each independent variable. For behavioral variables, questions such as "I am aware of the official CRB policies implemented at PCL" were used. With regard to an institutional related variable, a question like, "Are there clear guidelines or policies in place regarding the mandatory use of the Credit Reference Bureau system?" was included in the questionnaire. With respect to technical factors, a question like "The usability of the CRB system enables the enhancement of loan processing speed and quality at PCL" was used. We distributed a total of 109 questionnaires, of which 109 returned, resulting in a 100% response rate. We conducted semi-structured interviews with 30 CRB users, including credit officers, branch managers, and IT personnel. The interviews aimed to provide in-depth insights into their experiences and challenges with CRB integration. We transcribed the interviews verbatim for further analysis. We conducted the interviews after making prior arrangements with the participants. We conducted interviews for approximately 15–20 minutes, with some taking place face-to-face and others via telephone. Interviews helped the researcher collect qualitative data that supported quantitative ones.

3.6 Validity and Reliability of Data

To ensure the data was reliable and valid, a pilot study involving 20 respondents was conducted to refine the research instruments. We applied this to respondents from the same company, who were not part of the research. This helped the researcher spot areas of weakness in the tools. We used triangulation to cross-verify data from different sources responses to ensure accuracy. The reliability of the quantitative data was assessed using Cronbach's Alpha (α). A pre-test was conducted on 20 non-participating staff members. The resulting Cronbach's Alpha for all constructs exceeded the minimum threshold of 0.7, confirming the internal consistency and reliability of the measurement scale.

3.7 Data Analysis

We used Statistical Package for Social Sciences (SPSS) version 25.0 to analyze the quantitative data. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the characteristics of the sample and the core variables. To test the hypotheses and determine the influence of the independent variables on the dependent variable, Multiple Linear Regression (MLR) analysis was employed. The MLR model was structured as follows:

$$Y=\beta_0+\beta_1X_1+\beta 2X_2+\beta_3X_3+\epsilon$$

Where:

Y = CRB Utilization Effectiveness (Dependent Variable)
β_0 = Constant Term
X_1= Behavioral Factors (Independent Variable)
X_2 = Institutional Factors (Independent Variable)
X_3 = Technical Factors (Independent Variable)
β_1, β_2, β_3 = Regression Coefficients
ϵ = Error Term

The qualitative data collected through interviews was analyzed using Thematic Analysis. The process involved transcribing the interviews, reading the transcripts multiple times to gain familiarity, generating initial codes, searching for themes, reviewing and naming the themes, and producing the final report. This allowed for the identification of recurring patterns and in-depth insights into the staff experience with CRB integration at PCL.

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics of Respondents

The demographic profile of the respondents (N=109) indicated a good mix of experience and background relevant to the study. The majority of respondents were in the age group of 25-35 years (55%), which suggests a young, technologically-adept workforce. Males constituted 60% of the sample, while females were 40%. In terms of employment tenure, 45% had worked at PCL for 3–5 years, indicating a solid level of experience with the company's lending procedures and CRB system. Regarding roles, 50% were Loan Officers, 30% were Credit Managers, and 20% were Branch Support/IT Staff. This distribution ensures a comprehensive view of CRB utilization across operational and supervisory levels.

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Table 1

Demographic Characteristics of Respondents

Demographic Variable	Category	Frequency (N=109)	Percentage (%)
Age Group	18–24 years	–	–
	25–35 years	60	55%
	36–45 years	–	–
	Above 45 years	–	–
Gender	Male	65	60%
	Female	44	40%
Employment Tenure	Less than 3 years	–	–
	3–5 years	49	45%
	Above 5 years	–	–
Job Role	Loan Officers	55	50%
	Credit Managers	33	30%
	Branch Support/IT Staff	21	20%

4.2 Descriptive Statistics

The descriptive statistics revealed that all three independent variables Behavioral Factors, Institutional Factors, and Technical Factors were perceived to be relatively influential in CRB Utilization Effectiveness.

Table 2 Descriptive statistics

Variable	Mean (M)	Standard Deviation (SD)	Interpretation
Behavioral Factors (X1)	3.92	0.85	High influence (Staff adherence and training are prioritized)
Institutional Factors (X2)	4.15	0.79	Very high influence (Policies and management support are strong)
Technical Factors (X3)	3.78	0.91	High influence (System integration and reliability are generally good)
CRB Utilization Effectiveness (Y)	4.01	0.82	High effectiveness (Overall positive utilization experience)

The highest mean score was observed for Institutional Factors (M=4.15, SD=0.79), suggesting that PCL staff perceive the formal policies, management support, and risk structure as the strongest drivers of effective CRB use. Conversely, Technical Factors (M=3.78, SD=0.91) had the lowest mean, indicating that while perceived as good, issues related to system reliability, integration, or data quality might present the most prevalent challenges. The overall mean for CRB Utilization Effectiveness (M=4.01, SD=0.82) suggests that the system is utilized effectively by the majority of the staff.

4.3 Inferential Statistics (Multiple Linear Regression)

The Multiple Linear Regression (MLR) analysis was conducted to determine the relationship between the independent variables and CRB Utilization Effectiveness. The model summary showed an R-squared value of 0.685, meaning that 68.5% of the variance in CRB Utilization Effectiveness (NPL Mitigation) can be explained by Behavioral, Institutional, and Technical Factors. The F-statistic ($F(3, 105) = 75.8$, $p < 0.001$) was statistically significant, indicating that the overall model is a good fit for the data.

Table 3

Inferential Statistics

Variable	Unstandardized Coefficient (β)	Standardized Coefficient (Beta)	t-statistic	p-value	Decision
(Constant)	0.187		1.89	0.062	
Behavioral Factors (X_1)	0.290	0.301	3.52	**< 0.001**	Support H1
Institutional Factors (X_2)	0.412	0.445	4.98	**< 0.001**	Support H2
Technical Factors (X_3)	0.215	0.224	2.87	**0.005**	Support H3

The regression analysis revealed that behavioural, institutional, and technical factors all exert a statistically significant and positive influence on the effectiveness of Credit Reference Bureau (CRB) utilisation at Platinum Credit Limited (PCL). Collectively, these variables explained 68.5 per cent of the variance in CRB utilisation effectiveness, underscoring the comprehensive interdependence of human, organisational, and technological dimensions in

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determining the success of CRB integration. The findings align strongly with the Behavioural, Institutional, and Technical-Fit (BIT-Fit) model advanced by Erlirianto et al. (2015), which emphasises that system success is achieved when these three components are properly aligned.

4.3.1 Behavioural Factors and CRB Utilisation

Behavioural factors were found to have a significant and positive effect ($\beta=0.290$, $p<0.001$) on CRB utilisation effectiveness. This indicates that improved staff competencies, adherence to CRB procedures, and effective training enhance the utilisation of the system. The results corroborate the findings of Yusof et al. (2008), who emphasised that user-centric attributes such as perceived usefulness and ease of use significantly influence technology adoption. Similarly, Vedel et al. (2012) and Mohdhar and Shaalan (2021) found that user satisfaction and acceptance are central to the sustained use of information systems. In the context of PCL, although training programmes have been implemented, the thematic analysis revealed persistent gaps in compliance and practical application under operational pressure. The quote from a Credit Manager "*We have the knowledge, but sometimes the pressure to disburse loans makes some officers bypass the full CRB review*" illustrates the tension between knowledge and behavioural execution. This suggests that while behavioural awareness exists, performance incentives and workload pressures may discourage consistent adherence.

From a theoretical perspective, Erlirianto et al. (2015) argued that behavioural alignment ensures that staff values and attitudes correspond with organisational technological goals, an aspect only partially realised at PCL. Odiwuor et al. (2015) similarly asserted that behavioural readiness determines the quality of ICT utilisation. Therefore, it is evident that enhancing behavioural compliance through targeted, scenario-based training and institutional accountability measures remains critical for maximising CRB utilisation effectiveness.

4.3.2 Institutional Factors and CRB Utilisation

Institutional factors recorded the highest positive influence ($\beta=0.412$, $p<0.001$) on CRB utilisation effectiveness, marking them as the strongest determinant of system success at PCL. This finding underscores that top management commitment, effective policy enforcement, and sufficient resource allocation are the cornerstone of technological success. These results reinforce the central premise of the BIT-Fit model, which recognises institutional alignment as pivotal in ensuring that policies, resources, and leadership collectively enable technology-driven transformation (Erlirianto et al., 2015).

This conclusion also resonates with Tarbox (2014), who observed that well-defined organisational structures and leadership direction facilitate higher technology adoption rates, and Jackson and Allen (2024), who stressed the significance of organisational readiness in the implementation of new systems. The qualitative findings further supported this conclusion, with one Branch Manager affirming that "If management is strict on 'No CRB check, no loan,' the system works." This sentiment illustrates how managerial enforcement provides operational legitimacy and accountability to the system.

Empirical studies such as those by Garavand and Aslani (2016) and Muhanga and Haule (2021) have similarly concluded that strong institutional support and policy alignment foster successful information system adoption. In PCL's context, institutional backing has been particularly vital in reinforcing compliance culture and ensuring that CRB processes are embedded within loan disbursement workflows. However, while institutional structures at PCL appear robust, continued reinforcement of accountability frameworks and integration of CRB compliance indicators into staff performance assessments could further enhance sustainability.

4.3.3 Technical Factors and CRB Utilisation

Technical factors also exhibited a significant positive effect ($\beta=0.215$, $p=0.005$) on CRB utilisation, though the magnitude of influence was relatively lower compared to the other two factors. This finding highlights that while PCL's CRB system is functional and widely accepted, residual technical challenges particularly related to integration and system responsiveness still constrain full operational efficiency. The thematic analysis confirmed this, as IT staff cited delays and inconsistencies in data exchange between the Loan Origination System (LOS) and the CRB platform. These findings correspond with Hamad's (2019) argument that system reliability, usability, and seamless integration are vital for the sustained effectiveness of technology in operational environments. The conclusion also finds support in the studies of Daousis et al. (2024) and Khan et al. (2024), who both highlighted that system usability, speed, and interoperability determine user satisfaction and technology acceptance in financial contexts. Furthermore, Bevan (1995) defined usability as the "quality of use," implying that technological performance must go beyond functionality to ensure reliability and efficiency in daily operations. Hence, although the technical infrastructure at PCL supports CRB processes, the evidence suggests that improvements in system integration and automation are required to eliminate manual re-checks and reduce processing delays. This aligns with the BIT-Fit model's assertion that technical fit must evolve alongside organisational and behavioural changes for sustainable performance outcomes.

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4.3.4 Synthesis of Quantitative and Qualitative Findings

The convergence of quantitative and qualitative results provides a comprehensive understanding of the factors influencing CRB utilisation at PCL. The quantitative results statistically confirmed the strength of the relationships among behavioural, institutional, and technical dimensions, while the thematic analysis enriched these findings by revealing the contextual realities behind them. The behavioural theme of *staff compliance and knowledge gaps* demonstrated that technical proficiency alone is insufficient without sustained adherence. The institutional theme of *top management commitment* highlighted that leadership and policy enforcement serve as the strongest enablers of CRB effectiveness. Meanwhile, the technical theme of *integration challenges* exposed the operational bottlenecks that can undermine efficiency, even within a well-supported institutional framework. Overall, these findings confirm that CRB utilisation effectiveness at PCL is a multi-dimensional phenomenon shaped by the interplay of human attitudes, organisational support, and technological adequacy. This synthesis reinforces Erlirianto et al.'s (2015) proposition that technology-driven success is maximised when behavioural competence, institutional structures, and technical systems are harmonised.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study successfully investigated the determinants of Credit Reference Bureau (CRB) utilization effectiveness in mitigating Non-Performing Loan (NPL) risk at Platinum Credit Limited (PCL), focusing on behavioral, institutional, and technical factors. The findings confirm that all three factors have a significant positive influence on CRB effectiveness, which is directly linked to better NPL mitigation. Institutional factors, such as top management support and policy enforcement, were identified as the strongest determinant. Behavioral factors, particularly staff training and adherence, are significant but vulnerable to operational pressures. Technical factors, covering system integration and data quality, are also critical, though they represent the area with the most reported operational friction. The effective use of CRB systems at PCL hinges on a strategic fit between the available technology, the established organizational policies, and the behavior and competency of the loan officers.

5.2 Recommendations

Based on the findings and conclusions of this study, the following recommendations are put forth to enhance CRB utilization effectiveness and further mitigate NPL risk at Platinum Credit Limited: *Strengthen Behavioral Compliance and Training:* PCL should transition from general CRB training to scenario-based and continuous training focused on policy adherence under time pressure. Introduce a mandatory, automated compliance check that prevents loan processing from proceeding without a verified, recent CRB report to eliminate the option of bypassing the system due to time constraints.

Reinforce Institutional Oversight: The highest priority should be placed on leveraging the strong institutional support. PCL management should integrate CRB compliance metrics directly into the performance evaluations and incentive structures of loan officers and branch managers, making adherence to CRB protocols a non-negotiable key performance indicator (KPI). *Optimize Technical Integration:* PCL must invest in upgrading the technical interface to ensure seamless, real-time integration between the Loan Origination System (LOS) and the CRB platform. This investment should focus on reducing latency, improving data synchronization, and implementing automated data quality checks before submission or review to eliminate manual re-checks and reduce data errors.

Promote a Data Quality Culture: Given the reported technical friction, PCL should establish a formal data governance framework. This involves routine audits of CRB reports and feedback mechanisms to credit bureaus to ensure the highest level of accuracy and completeness of borrower data, which is foundational to accurate NPL risk assessment.

REFERENCES

Abdirahman, M., & Isaksson, E. (2024). Mobile money, credit, and household welfare: Evidence from Somalia. *Journal of Economic Development, 18*(1), 1–15.

Albokai, M., Hamad, I., & Eljamei, A. (2019). Credit information sharing and loan performance: Evidence from Jordanian banks. *Journal of Accounting, Business & Management, 26*(2), 1–15.

Alkalah, D. E. (2016). *The impact of credit information sharing on commercial banks' lending decisions in Palestine* (Master's thesis, An-Najah National University).

Auyo, S. U., Lawal, Z., & Mohammed, H. (2023). The nexus between credit bureau and non-performing loans in Nigeria. *Global Journal of Social Sciences Studies, 10*(1), 1–12.

Bevan, N. (1995). Usability is quality of use. *Journal of Software Quality, 4*(2), 1–8.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE.

Licensed Under Creative Commons Attribution (CC BY-NC)

Croll, P. (2009). Measuring user-centred quality. *Journal of Systems and Software, 82*(2), 200–211.

Daousis, K., Sarantou, P., & Karousos, K. (2024). Evaluation of the usability of electronic banking systems: An empirical study. *International Journal of Computer and Information Technology, 13*(1), 1–10.

Erlirianto, D., Wibisono, M., & Yuniarti, D. (2015). Determinants of health information systems success: An application of the HOT-Fit model. *International Journal of Medical Informatics, 84*(11), 1017–1026.

Garavand, A., & Aslani, Y. (2016). An investigation on the factors affecting the success of electronic health records implementation in hospitals. *International Journal of Medical Informatics, 92*, 1–10.

Good, J. (2015). Usability and user experience. *Journal of Usability Studies, 10*(3), 100–115.

Hamad, A. (2019). *Challenges of implementing a credit information sharing system in Zanzibar* (Unpublished master's thesis). The Open University of Tanzania.

Ibrahim, A. M. (2013). The effect of credit reference bureau services on credit risk management in commercial banks in Kenya. *Journal of Finance and Investment Analysis, 2*(4), 1–15.

Jackson, J., & Allen, P. (2024). The role of organizational readiness in new technology implementation. *Journal of Organizational Change Management, 37*(1), 10–25.

Janota, E., Kubíček, P., & Klement, M. (2022). Usability analysis of business information systems based on the HOT-fit model. *Journal of Business Economics and Management, 23*(2), 335–351.

Khan, M., Ahmad, H., & Hussain, M. (2024). Assessing the usability and effectiveness of financial technology platforms. *Journal of Financial Technology, 20*(1), 1–12.

Mbizi, B. (2021). *Effectiveness of credit risk management practices on loan portfolio quality: A case study of Platinum Credit Limited* (Unpublished MBA thesis). Mzumbe University.

Middleton, C. A., Siau, K., & Zhang, J. (2013). The role of the credit information sharing system in preventing credit defaults. *International Journal of Information Management, 33*(3), 513–524.

Mohdhar, O. M., & Shaalan, Y. M. (2021). Factors affecting the success of HIS implementation in Saudi Arabian hospitals: An application of the HOT-Fit model. *International Journal of Medical Informatics, 145*(1), 1–10.

Muhanga, M., & Haule, M. (2021). Impact of credit reference bureau on loan service delivery in commercial banks in Tanzania. *Tanzania Economic Review, 11*(1), 1–15.

Odiwuor, C. W., Onyuka, J. H. O., Muhoho, F., Muchiri, J., Yegon, C., Muthoki, L., Nyaberi, J., Kina, B., & Nginya, C. (2015). Utilization of information communication technology (ICT) among health care providers in Gatundu North District of Kiambu County, Kenya. *International Journal of Applied Research, 1*(11), 1025–1029.

Peña, M., Castro, J., & Lemos, M. (2024). Assessing user satisfaction and training effectiveness in enterprise resource planning systems. *Journal of Business Information Systems, 15*(2), 50–65.

Serrat, O. (2021). *Techtonic: The role of technology in organizations* (Unpublished manuscript). The Chicago School of Professional Psychology.

Tarbox, D. (2014). Organizational structure and technology adoption. *Journal of Management Information Systems, 31*(2), 100–115.

Vedel, I., Lapointe, L., Lussier, M. T., Richard, C., Goudreau, J., Lalonde, L., & Turcotte, A. (2012). Healthcare professionals' adoption and use of a clinical information system (CIS) in primary care: Insights from the Da Vinci study. *International Journal of Medical Informatics, 81*(2), 145–155.

Yusof, M. M., Kuljis, R., & Paul, R. J. (2008). An evaluation framework for health information systems: Human, organization and technology-fit (HOT-Fit). *International Journal of Medical Informatics, 77*(6), 386–398.

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Social support and performance among non-teaching employees in selected public universities in Kenya

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ABSTRACT

Globally, non-teaching staff execute critical roles in the operations of universities, supporting mission, vision, research, and service to the community through performance. There is a notion that work obligations and personal and family duties flow over into one another, affecting employee performance. Kenyan public universities experience drops in productivity due to inadequate employee performance. Non-teaching employees' support is to support access to quality education to contribute to positive social, economic, and environmental outcomes. Specifically, the study focused on establishing social support's effects on performance using theories of spillover and social exchange with positivist research philosophy. The eight selected public universities were the unit of analysis. The study's target population was 3538. Random stratified sampling techniques ascertained a sample size of 343 respondents. A descriptive andcross-sectionaln survey design was employed. The questionnaire and interview schedule were used as data instruments. A pilot test was done at the University of Eldoret. A Cronbach's alpha tested the reliability of instruments. The validity of the interview schedule was tested with content analysis and expertjudgement.. Diagnostic tests were done before inferential statistics confirmed the variable violation. Data cleaning used SPSS27.0,0 and descriptive statistics were presented in frequencies, percentages, means and standard deviation, content, and expertjudgementt analysis. Inferential statistics were presented in tables and graphs. The findings results revealed a strong significant association between social support and performance with a linearity of (0.212 > 0.05). Findings contribute information to public universities, government, and human resource practitioners to develop strategies and policies that promote performance. The research concluded and recommendedther development of related studies in the future.

Keywords: Non-Teaching Employees, Performance, Selected Public Universities, Social Support

I. INTRODUCTION

Nowadays, organizations have to invent and improve with distinctive dynamic features that permit their competitive performance for survival in the dynamic market. Notably, employees are the eminent resource outstanding to others within the doctrine of resources. They are humans who have anxiety about their happiness, emotional needs, and career development. To pull through, organizations have to create means for sustainable competitive advantages to achieve performance aims. Charoensukmongkol and Phungsoonthorn (2021) proclaim that supervisory and coworker support is the primary origin of social support for workers in Thailand. Since they provide rewards, protection, assistance, and motivation to enhance employee performance. Additionally, various studies have found that supervisors play a fundamental role in decreasing employees' uncertainties and obscurities that they experience in employee performance Thus, supervisor support relieves the level of uncertainties that employees experienced during the COVID-19 crisis.

Alcover *et al.* (2017) further determined that a qualitative investigation of social support dimensions proved that they may enhance motivation, and promotion in their performance. Nevertheless, Skiba and Wildman (2019), endorse that supervisory support offers views that comforts employees' concerns about worries and reduces turnover, which improves performance. Therefore, supervisor expertise in giving key resources and information to employees plays an essential supporting role in reducing the perceived uncertainties of employees (Tummers *et al.*, 2018). However, Nielsen *et al.* (2020) posit that supervisors who treat employees with respect set the atmosphere for an entire

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shift; because managers with poor attitudes may decrease employees' performance, and retention could increase when employees feel detached and leave due to work pressure.

Thus, social support is a key driving aspect that has a significant outcome on the health, well being, and job performance of an employee, and is beneficial to both employer and employee.Hence, there is a consen sus evident that managers, supervisors, and coworkers, havea significant role in providing support that motivates empl oyee performance. Furthermore, supervisors, coworkers, and friends in Tunisia in Africa provide different types of physical or nonphysical support, for example, emotional on routine basis (Khedher & Asadullah., 2020). Supervisory support occurs when employees perceive that their superiors are concerned about their overall welfare in the workplace by providing social resources pertinent to their tasks or objectives. Consequently, supervisory assistance in resolving work-family-related issues illustrates that reputable supervisory support instills motivation, which elevates employee morale, inspires and motivates individuals, and ultimately enhances performance (Oludayo & Omunijo, 2020).

Hidayah *et al*. (2019) recommend that sufficient support from supervisors makes employees feel confident in their work, while self-directed employees who obtain sufficient supervisor support increase higher levels of performance. Afzal *et al*. (2019) confirmed that supervisor support completely affects employee performance. In addition, social support is the emotional concern of influential assistance, and empathy offered by individuals such as co-workers, and supervisors. Moreover, the level at work where workers identify that supervisor's care about universal welfare is at the workplace where the establishment of resources corresponds to employees' tasks or goals.

In Kenya, the higher education sectors are experiencing an increase in performance competition caused by the entry of more accredited institutions. Okhonjo, *et al*. (2022) assert that banking sector that employ social supportive mechanism, attract health-based on work pressure among the employees and improves performance. Hence, these have led to stiff competition among universities given the plans formulated and their estimation. However, Ngome and Mulinya (2018) supports that institutes not only compete for the student's progress, but also with academic and non-academic employees' performance. Similarly, scholars suggest that supervisors may employ their position to offer criticisms that either encourage or discourage the development of particular human resource practices. Additionally, they can increase employee engagement in Kenyan state-owned enterprises. Similarly, scholars suggested that supervisors may employ their position to offer criticisms that either encourage or discourage the development of particular human resource practices. Thus, supervisors are essential in aiding personnel to remain contented with increased performance.

Previous studies explaining the effect of social support on performance include research conducted by Puspitasari and Ayu (2018); Khan *et al.* (2019), Pelin & Osoin (2021); and Mongdong *et al.* (2021) revealed that social support has a positive and significant effect on performance. Disparity to the research results conducted by Rahmawati and Irwana (2020), social support has no significant impact on performance. The contextual and knowledge gap to be examined in Kenya among non-teaching employees in the selected public university, Kenya, to improve performance through supervisors and coworker support for the betterment of public universities' service delivery.

1.1 Research Objective

To establish the effect of social support on performance among non-teaching employees in selected public universities in Kenya.

1.2 Research Hypothesis

Ho_1: Social Support has no significant effect on performance among non-teaching employees in selected public universities in Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1The spillover-Theory

The spillover model originated from the work of Wilensky in 1960, who proposed that experiences in the workplace extend to non-work contexts within an organization. In 1970, Parker and Scott further developed this idea by highlighting the transfer of experiences from the work environment to non-work settings. Grzywacz and Marks (2000) expanded the theory, defining it as the transfer of emotions, skills, and values between work and personal life.

Amstad *et al*. (2011) noted that employees may experience a poor relationship with her supervisor which creates some sort of negative strain like disappointment, negative, emotions and mental preoccupation. This may occur not only during working time but most probably also during non-work time. The spill-over theory was applied to relate to the effect of social support, flexible work schedules, time off policies, and wellness initiatives on employee performance. Moreover, it drew attention to how the working environment acts as a moderator between independent variables such as job characteristics and dependent factors like worker productivity. The spillover theory has been the subject of

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numerous studies, albeit with conceptual and methodological gaps that vary by context (Bello et al., 2020). The present study determined the theoretical knowledge gap to improve the employee work-life balance and increase performance.

2.1.2 Social Exchange Theory

Social exchange is recognized as a positive indicator between employers and employees in an organization that impacts the attainment of objectives through effective performance. This implies that taking into account the advantages and disadvantages of each relationship dictates whether the social association should be maintained or terminated. Additionally, Blau (1964) states that individuals ought to assist others and that those who have assisted them in the past should not be harmed or intended to be harmed. Social exchange provides obligations and freedom in workplaces through social networks and a succession of interactions over time (Brunneto et al., 2016). This example demonstrates that social interaction between two interdependent individuals functions as a reciprocal attraction.

2.1.4 Theoretical Review

According to Homans (1961), social exchange theory was viewed as a social behavior driven by costs and benefits with employees within organizations. However, Zhao *et al.* (2020) discovered that this theory has been used in various studies as sharing of ideas, examining of interrelationships, and communications. Therefore, Homans believed that social exchange is the behavior that depend on the benefits gained between employer and employee. Hence, the study adopted the social exchange theory to positively indicate the standards indicator between employers and employees in selected public universities, Kenya to investigate employee social support and performance though behavior (Homans, 1961). Thus, it also considers organizational attitude and behavior among employees performance.

Social exchange provides obligations and freedom in workplaces through social networks and a succession of interactions over time (Brunetto *et al.*, 2016). Social exchange theory was outstretched to the functional and organizational environs with the value of norms and behaviors. This theory holds the perspective that personality stereo typically presume reciprocal support. This assistance could be personal tenderness, individual reliance, feeling among staff, and other interpersonal measure. According to scholarly studies, social exchange theory disclosed that there is a basic interaction between employees and organizations to complete their rewards and decrease their expenses in performance. This research paper explains the concept of social support on job performance. The social support theory has been enforced in several sectors, including banking, manufacturing, and healthcare, to determine how individuals perceive and implement social exchange theory.

2.2 Empirical Review

Wulantika et al. (2023) sought to examine the interplay between job fatigue, social support, and employee performance. The study employed descriptive statistics and confirmation techniques with primary data, collecting information from 31 online questionnaires dispersed to employees of Jayakarta Suites Bandung. They utilized statistical techniques and multiple regression in data analysis. The data collection method engaged the saturated sampling. The results indicated that employee performance is influenced to some extent by exhaustion, whereas social support demonstrates a negative influence on performance. The study outcomes provided an overview of job fatigue and social can impact on performance organizations. The knowledge gap regarding social support and employee performance has been identified to enhance employee output.

Zulhakim et al. (2022) determined the significant outcome of resilience and social support in the performance of female nurses with a mediation variable of work engagement in Maratam City Hospital, Indonesia. The target population is 246 female nurses at the Mataram City Regional Hospital. The sample size of 72 respondents was determined using the Slovin formula with a sampling technique of simple random sampling. The research type was causality; data collection tool was PLS-SEM Analysis. The findings revealed that social support affected on both work engagement and performance.

Pelin and Osoian (2021) investigated and elucidated the correlations between task performance, organizational citizenship behavior, social support, and various demographic factors that could impact these variables. The quantitative research was conducted using data from a sociological survey that comprised two standardized questionnaires and a Likert scale that assessed employees' task performance, coworkers' perceived support, and organizational citizenship behavior. The sample size is 300 pairs of personnel, consisting of employees and their direct supervisors, who are employed in Romanian service provision firms. Using the free software JASP 0.14.1.0, correlation and regression analyzes was conducted on the survey results. Although the results demonstrated positive correlations between the variables, this does not indicate that the support of coworkers has any bearing on task performance. It was not possible to establish statistically significant relationships using demographic data. Potential future research could benefit from a more extensive sample size.

Putra *et al.* (2021) purposed to determine how supervisor, peer, and familial support affected the performance of lecturers at an Indonesian private university. The data was obtained through the implementation of basic random

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sampling of basic random sampling on a sample size of 172 university lecturers' populations. 112 respondents responded to the questionnaire, confirming the validity of the results. The data was processed utilizing the SEM method and Smart PLS 3.0 Software. The study outcome identified that social factors, supervision, peers, and family support had a strong evidence relationship to performance. This novel study presents a framework for enhancing the performance among instructors at private universities in Indonesia by augmenting social support for their employment. This study identified a knowledge deficit in non-teaching personnel in the chosen public universities located in Kenya.

Nasurdin *et al. (*2020) researched the integration of social support among nurses work engagement, and job performance in the nursing profession, Malaysia. The research objective was to examine the distinct effects of supervisory support and assess the intervening function of work engagement. A target population of 639 staff nurses in nine private hospitals in Malaysia participated in the survey. The technique of partial least squares was employed to examine the research hypotheses. The findings indicated that social support exerted positive direct effect on job performance. Hence, the study recommended that private hospitals allow nurses to participate in decision-making to enhance their knowledge, skills, and abilities in their performance. The present study engaged the supervisory and coworker support in selected public universities as a contextual gap to better their work attendance.

Astawa *et al*. (2023), researched the significance of supervisors' support in motivating the work of operational employees and its implication on performance and retention in 5–star hotels in Bali. The target population was permanent employees of 5-star hotels in Bali. A sampling of 5-star hotels used in sampling areas including; Badung, Gianyar, and Regencies. The sample size of 125 research respondents was determined by purposive sampling. Data collection techniques such as observation, interviews, and research questionnaires were utilized. Quantitative descriptive analysis was employed to realize the current status of employees based on supervisor support, work motivation, performance, and employee retention. The finding established the importance of supervisor support in improving the performance and retention of 5-star hotel employees in Bali in the future. The results showed that supervisors' support increased employee performance and retention.

2.3 Conceptual Framework

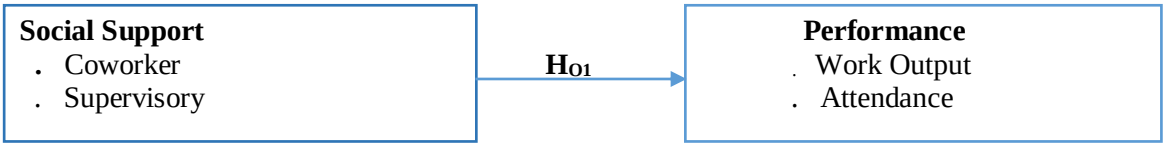

Figure 1
Conceptual Framework

According to Mugenda and Mugenda (2019) conceptual framework reviews the relationship between independent and dependent study variables. Independent and dependent variables are discussed based on how they are rationalized and measured. The independent variable was social support, was examined through co-worker and supervisory support. The dependent variable was performance measured through work output and attendance.

III. METHODOLOGY

3.1 Research Design

The cross-section survey approach is where the researcher gets all the information they need in a single task (Saunders *et al.,* 2019). The researcher's objective was to examine, analyze, and assess the sufficiency and positive nature of the variables. Additionally, the survey method was chosen due to its unique ability to generalize data from a sample and determine if there was an evidential relationship between variables at a specific moment in time (Mugenda & Mugenda, 2019). Nevertheless, the utilization of a cross-sectional survey design holds significance in elucidating or depicting data obtained from populations that exceed the scope of direct observation.

3.2 Data Collection Methods

Data collection is the systematic acquisition and organization of collected information that is valuable in elucidating discoveries pertinent to a particular domain of research. According to Kothari and Garg (2014), a mixed methods approach to data acquisition guarantees that the research will amass a substantial amount of both qualitative and quantitative data. Utilizing a questionnaire and interview schedule, the proposed research gathered both qualitative and quantitative data from study participants.

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3.3 Target Population

The study's target population objective comprised all non-teaching employees employed in the eight public universities that were specifically chosen from Kenya (CUE University Statistics, 2022). The total number of non-teaching personnel at the eight (8) selected universities was 3538.

3.5 Sampling Procedures

The research exploited a stratified sampling technique, wherein a subset of the population, referred to as a stratum, was selected based on the union affiliations of Kusu and Kudheiha (Kothari & Garg, 2014). By employing this methodology, the investigator was capable of conducting a reliable study on a limited sample size that was deliberately chosen to offer qualitative information pertinent to addressing research inquiries and fulfilling the specific objectives. Furthermore, in comparison to simple random sampling, the method exhibited enhanced statistical exactness due to the reduced variability observed within the subgroups as opposed to the substantial variation encountered when sampling the entire population. This also necessitates a small sample size, which helped the researchers save a substantial amount of time, money, and effort.

3.6 Data Analysis Techniques

The sample size was determined using Yamane's formula (Yamane, 1967). The sample size was 378 respondents based on Yamanes' formula. The data collection tools were questionnaires and an interview schedule. A Cronbach alpha coefficient exceeding 0.7 is deemed adequate to validate the reliability of the variables (Adeniran, 2019). The reliability of determining the instruments was tested under Cronbach's alpha at 0.896. The study measured the validity of the research instruments using content and expert judgment. Data analysis was cleaned using the SPSS 27.0 version software. The validity of the instrument was measured by content validity and expert judgment. Demographic information was shown in figures and graphs. Descriptive statistics were presented using frequencies, percentages, means, and standard deviation. Interview analysis used content and expert judgment. Inferential statistics were presented in tables in model summary, ANOVA, and regression coefficients.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon \text{ ……..…….Model 1}$$

Where:

Y = Dependent Variable (Employee Performance)
$X_{1=}$ Social Support
$\beta 0$ = the constant
$\beta 1$= the regression coefficient
ε = the error term.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The respondents were provided with 378 questionnaires in total. A return of 350 questionnaires (93 percent) was obtained. Out of the total, seven items (1.9%) were excluded due to substantial response gaps for the variable components. The sample utilized in the study was 343 respondents.

4.2 Descriptive Analysis Results

The object of the study was to establish the effect of social support on performance among non-teaching employees in selected public universities in Kenya. The table below presents responses from non-teaching employees in selected public universities in Kenya regarding various statements on social support. Respondents rated their level of agreement with each statement using a five-point Likert scale: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Fairly Agree (FA), 4 = Agree (A), and 5 = Strongly Agree (SA). The table also displays the total number of respondents, mean, and standard deviation (StD) for each statement.

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Table 1

Social Support

STATEMENTS	SCALE								
		SD	D	FA	A	SA	Total	Mean	StD
At this university, my co-worker would step in for me if I needed to leave work to deal with a non-work issue.	(F) (%)	5 (1.5)	44 (12.8)	61 (17.8)	164 (47.8)	69 (20.1)	343 (100)	4.05	1.34
My co-worker is instrumental in facilitating the successful completion of my tasks at this university.	(F) (%)	7 (2.0)	42 (12.2)	43 (12.5)	127 (37.0)	124 (36.3)	343 (100)	3.97	1.38
My supervisor assists me in organizing my work schedule in the event of any challenges.	(F) (%)	16 (4.7)	45 (13.1)	33 (9.6)	176 (51.3	73 (21.3)	343 (100	4.07	1.29
I can rely on my supervisor to effectively manage my job obligations in the event of unforeseen non-work obligations.	(F) (%)	19 (5.5)	40 (11.7)	57 (16.6)	104 (30.3)	123 (35.9)	343 (100	4.02	1.41
Composite Mean and Standard Deviation								4.03	1.36

(F) = Frequency

(%) = Percentage.

The results calculated mean score of 4.05 and standard deviation of 1.34, and determined a significant proportion of the participants agreed that coworkers should covers one another if one must abandon work to attend to a critical non-work matter. A mean score of 3.97 and a standard deviation of 1.38, indicated a significant proportion of the respondents agreed that colleagues at their university assists in completing tasks. Based on the calculated mean score of 4.07 and standard deviation of 1.29 established that a weighty proportion of the participants agreed that supervisors assisted in scheduling in the event of difficulties. As indicated by the mean score of 4.02 and standard deviation of 1.41, the majority of respondents agreed that their supervisor can be trusted upon to ensure that work responsibilities are encountered in the event of unforeseen non-work obligations.

The findings of the present study indicate a consistently elevated consensus among participants concerning the significance of support from colleagues and supervisors in the workplace. The average scores—spanning from 3.97 (colleague assistance with tasks) to 4.07 (supervisor assistance with scheduling)—demonstrate a robust perception of social support within the organisation. This is corroborated by comparatively low standard deviations, indicating agreement among respondents.

Based on a standard deviation of 1.20 and a mean score of 4.22, it can be inferred that a significant proportion of participants expressed their ability to meet deadlines. The data exposed that a substantial number of participants felt that the tools they use to enhance their job output operate as a motivating factor for maintaining a healthy work-life balance, as indicated by an average score of 4.62 and a standard deviation of 1.23. The data reveals that a substantial number of participants concurred that it is not challenging to schedule time to meet their obligations during an emergency, as evidenced by a mean score of 4.16 and a standard deviation of 1.49. The majority of respondents, with a mean score of 4.49 and a standard deviation of 1.26, concurred that their performance had enhanced due to more time allocated for work and family responsibilities. The observation that the item mean surpassed the composite mean by a margin of 4.37 indicates a positive influence of the item mean on the composite mean.

The study's findings indicate a robust and consistent perception of social support among non-teaching staff, evidenced by elevated mean scores and minimal standard deviations, underscoring the consensus that colleagues and supervisors provide active support during both work-related and personal challenges. Participants indicated their capacity to adhere to deadlines and sustain work-life balance, with tools and flexible scheduling serving as incentives. The findings correspond with the studies of Putra et al. (2021), Nasurdin et al. (2020), Astawa et al. (2023), and Zulhakim et al. (2022), all of which underscore that strong support systems markedly improve work engagement, motivation, and job performance.

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Table 2

Performance

STATEMENTS	SCALE								
		SD	D	FA	A	SA	Total	Mean	StD
I can meet deadlines.	(F) (%)	6 (1.7)	19 (5.5)	37 (10.8)	189 (55.2)	92 (26.8)	343 (100)	4.22	1.20
The tools I use in my duty performance enhance my work output.	(F) (%)	11 (3.2)	35 (10.2)	30 (8.7)	157 (45.8)	110 (32.1)	(343) (100)	4.62	1.23
I can easily make arrangements to attend to my duties in case of a problem.	(F) (%)	10 (2.9)	51 (14.9)	65 (19.0)	137 (39.9)	80 (23.3)	343 (100)	4.16	1.49
My performance has improved because I get time to attend to my duty and personal life.	(F) (%)	4 (1.2)	29 (8.5)	34 (9.9)	137 (39.9)	139 (40.5)	343 (100)	4.49	1.26
Composite Mean and Standard Deviation								4.37	1.30

(F) *= Frequency* **(%)** = Percentage

In the descriptive analysis of social support and performance, most of the respondents agreed that the co-worker would step in when one wants to attend to a non-work issue (M= 4.05, SD =1.34). This declares that the selected public universities practice social support among non-teaching employees. The social support statements of the coworker and supervisory support agreed with (M= 4.03, SD=1.36). These findings suggest a supportive workplace culture where colleagues willingly assist each other during non-work obligations. This aligns with Putra et al. (2021), Nasurdin et al. (2020), and Astawa et al. (2023), who found that robust coworker and supervisor support positively influences employee engagement, job performance, and organizational climate.

4.3 Results on Reliability

From Table 3. The results show that Cronbach's alpha coefficient was more than the minimal needed value of 0.70, resulting in an overall value of 0.896, which points to a higher level of inner consistency for our scale and instruments were dependable (Cronbach, 1951).

Table 3

Results on Reliability, Mean, Standard Deviation and Correlation of the Study

Variable	Cronbach alpha	Variable	Cronbach alpha	Cronbach alpha
Co-worker	0.872	Social Support	0.978	0.896
Supervisory	0.912			

4.3 Correlation Analysis Results

The findings demonstrate a significant positive correlation between social support practices and employee performance, with a correlation coefficient of R = 0.670 and a p-value of 0.017, which is below the standard significance level of 0.05. This indicates that an increase in social support from both colleagues and supervisors correlates with enhanced job performance. The strength of the correlation underscores the crucial role that supportive work environments have in enhancing productivity and engagement among employees. The results align with those of Mongdong et al. (2021), who similarly identified a significant positive correlation between social support and employee performance in their research. This concordance with prior studies underscores the significant influence of social support systems on organisational results and affirms the necessity of fostering such practices within institutions.

Table 4

Correlation Analysis

Variables	Social Support Practices	Performance
Social Support Practices	1	
Performance	.670*	1
Sig. (2-tailed)	0.000	
N	100	100
*** Correlation is significant at the 0.05 level (2-tailed).**		

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4.4 Simple Linear Regression Results Social Support and Performance

Table 5 shows that the R-squared value is 0.449. The results of this study indicate that social support was responsible for 44.9%.

Table 5

Model Summary; Social Support and Employee Performance.

Model Summary									
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**				
					R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.670[a]	.449	.448	.78603	.449	278.032	1	341	.000

a. Predictors: (Constant), Social Support

The conclusion is drawn from the analysis of variance (ANOVA) test conducted at a significance level of 0.05 ($p=0.001 < 0.05$). The significance value of 0.001 is below the preset significance limit of 0.05, for proving support for this assertion.

Table 6

ANOVA: Social Support and Performance

ANOVA						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	171.780	1	171.780	278.032	.000[b]
	Residual	210.684	341	.618		
	Total	382.464	342			

a. Dependent Variable: Employee Performance

b. Predictors: (Constant), Social Support

Further, the results showed that social support impacted on the performance of non-teaching staff in public universities in Kenya (t-statistic=16.674, p-value = 0.001< 0.05), as shown in Table 4.

Table 7

Regression Coefficients; Social Support and Performance

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.501	.138		10.899	.000
	Social Support	.608	.036	.670	16.674	.000
a. Dependent Variable: Employee Performance						

Based on these findings, the null hypothesis was rejected at the 5% significance level, suggesting a strong relationship between social support and employee performance. Specifically, an increase of one unit in social support was associated with a 0.608 increase in the performance of non-teaching staff at the selected public universities in Kenya. Thus, the null hypothesis that social support has no significant effect on the performance of non-teaching personnel in public universities in Kenya was refuted. The results reflect past study findings that proved that universities should provide a creative support atmosphere that allows employee perform with social support groups, and co-workers to relax during breaks or non-working hours. Hidayah *et al.* (2019) and Mongdong, *et al.* (2021), supported by their previous studies, realized that social support has a deep enhancing therapy that impacts the psychological environment that promotes performance. Moreover, Oludayo and Omonijo. (2020), proved that supervisory support provides encouragement that enhances, morale, empowers and boosts enthusiasm which increases employee performance. Astawa et al (2023), there was a consensus agreement that social support increases and motivates performance.

Thus the model equation is

$$performance = 1.501 + 0.608 * social\ sup\ port$$

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

As per the objective of the study, the findings conclude that the investigation revealed that most of the respondents were in agreement with co-workers and supervisory support. It concluded that the universities administration under study have recognized that social support is a key strategy in performance that improves output and attendance. However, co-workers provide inspiration and support which is critical in overcoming all misfortunes, including a significant effect on the behavior and performance of individual employees. The social support given to nurses provides motivation and enthusiasm to carry out their profession and work as a nurse. So indirectly, social support can also positively impact performance, meaning that the higher the social support is provided, employees feel comfortable consulting with their co-workers about tasks that they have doubts about to reduce their mistakes. Therefore, coworker support positively and significantly affects employee job satisfaction. The results of the analysis show that support from co-workers makes employees less tired, lose their personalities, confidence, and psychologically safety at work so that employees feel more satisfied at work. The present study was based on social support and performance among non-teaching in selected public universities, in Kenya. Further studies may be researched in other public service delivery institutions.

5.2 Recommendations

Future researchers may use other measures of strategies of social support such as job design, work load and performance and a similar study may be carried out in other public service delivery institutions such as public health institutions since this study was limited to the selected public universities.

REFERENCES

Adeniran, A. O. (2019). Application of Likert scale's type and Cronbach's alpha analysis in an airport perception study. *Scholar Journal of Applied Sciences and Research, 2*(4), 1–5.

Afzal, S., Arshad, M., Saleem, S., & Farooq, O. (2019). The impact of perceived supervisor support on employees' turnover intention and task performance: Mediation of self-efficacy. *Journal of Management Development, 38*(5), 369–382.

Alcover, C. M., Rico, R., Turnley, W. H., & Bolino, M. C. (2017). Psychological contracts in teams. In *The Wiley Blackwell handbook of the psychology of team working and collaborative processes* (pp. 417–439). Wiley Blackwell.

Amstad, F. T., Meier, L. L., Fasel, U., Elfering, A., & Semmer, N. K. (2011). A meta-analysis of work-family conflict and various outcomes with a special emphasis on cross-domain versus matching-domain relations. *Journal of Occupational Health Psychology, 16*(5), 151–169.

Astawa, K., Armoni, N. L. E., & Suardani, A. A. P. (2023). The importance of supervisor support to improve employee performance and retention in 5-star hotels in Bali. *Technium Social Sciences Journal, 47*, 240.

Bello, Z., & Tanko, G. I. (2020). Review of work-life balance theories. *GATR Global Journal of Business Social Science Review, 8*, 217–227.

Blau, P. M. (1964). Justice in social exchange. *Sociological Inquiry, 34*, 193–206.

Brunetto, Y., Xerri, M. J., Nelson, S., & Farr-Wharton, B. (2016). The role of informal and formal networks: How professionals can be innovative in a constrained fiscal environment. *International Journal of Innovation Management, 20*(3), 1650051.

Charoensukmongkol, P., & Phungsoonthorn, T. (2021). The effectiveness of supervisor support in lessening perceived uncertainties and emotional exhaustion of university employees during the Covid-19 crisis: The constraining role of organizational intransigence. *The Journal of General Psychology, 148*(4), 431–450.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.

CUE Report: 2018/2019: Improving the performance of public universities in delivering higher education in Kenya. (November, 2022).

Grzywacz, J. G., & Marks, N. F. (2000). Reconceptualizing the work-family interface: An ecological perspective on the correlates of positive and negative spillover between work and family. *Journal of Occupational Health Psychology, 5*(6), 111. http://dx.doi.org/10.1037/1076-8998.5.1.111

Hidayah, I., Siti, N., Suan, C. L., & Karatepe, O. M. (2019). The effects of supervisor support and self-efficacy on call center employees' work engagement and quitting intentions. *International Journal of Manpower, 40*(4), 688–703.

Homans, G. C. (1961). *Social behavior: Its elementary forms*. Harcourt Brace & World.

Licensed Under Creative Commons Attribution (CC BY-NC)

Khan, F., Rasli, A. M., Yasir, M., & Khan, Q. (2019). Interaction effect of social support: The effect of workload on job burnout among universities academicians: Case of Pakistan. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 10*(13), 10A3.

Khedher, H., & Asadullah, M. A. (2020). Role of social and organizational support in the adjustment of Tunisian self-initiated expatriates. *European Journal of Training and Development, 44*(2/3), 171–190.

Kothari, C. R., & Garg, G. (2014). *Research methodology: Methods and techniques* (3rd ed.). New Age International Publishers.

Mongdong, A., Hartati, M. E., & Sengkey, M. M. (2021). The effect of coworkers' social support on performance in Tomohon City. *Psychopedia, 2*(1), 123–130.

Mugenda, O., & Mugenda, A. (2019). *Research methods: Quantitative and qualitative approaches* (3rd rev. ed.). Nairobi.

Nasurdin, A. M., Tan, C. L., & Khan, S. N. (2020). The impact of social support on nurses' motivation: A cross-sectional study in Malaysia. *Asia Pacific Journal of Public Health, 32*(8), 430–435.

Ngome, P., & Mulinya, C. (2018). The challenge of integrating street trade in the urban development plan and policies: Kakamega Town, Kenya. *IOSR Journal of Humanities and Social Science, 23*(7), 78–89.

Nielsen, M. B., Christensen, J. O., Finne, L. B., & Knardahl, S. (2020). Workplace bullying, mental distress, and sickness absence: The protective role of social support. *International Archives of Occupational and Environmental Health, 93*, 43–53.

Okhonjo, G. F., Kadima, M. J., & Miroga, J. (2022). Social support practices on work pressure among employees in banking sector, Kakamega Town; Kenya. *The Strategic Journal of Business & Change Management, 9*(2), 1102–1115.

Oludayo, A. O., & Omonijo, D. O. (2020). Work-life balance: Relevance of social support. *Academy of Strategic Management Journal, 19*(3), 1–10.

Pelin, I. I., & Osoian, C. (2021). Co-workers support and job performance. *Studia Universitatis Babes-Bolyai Oeconomica, 66*(2), 74–86.

Puspitasari, K. D., & Ayu. (2018). The effect of workload and social support on employee performance at PT. Perkebunan Nusantara X Sustainable Sugar Factory in Nganjuk. *Journal of Management Science, 6*(4), 394–400.

Putra, F., Asbari, M., Purwanto, A., Novitasari, D., & Santoso, P. B. (2021). Linking social support and performance in higher education. *International Journal of Social and Management Studies, 2*(1), 64–73.

Rahmawati, M., & Irwana. (2020). The effect of work stress, work satisfaction and social support on nursing performance in Sebatik's Community Health Center (Puskesmas). *Jurnal Ekonomika, 11*(2), 1–15.

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson.

Skiba, T., & Wildman, J. L. (2019). Uncertainty reducer, exchange deepener, or self-determination enhancer? Feeling trust versus feeling trusted in supervisor-subordinate relationships. *Journal of Business and Psychology, 34*(2), 219–235.

Tummers, L., Steijn, B., Nevicka, B., & Heerema, M. (2018). The effects of leadership and job autonomy on vitality: Survey and experimental evidence. *Review of Public Personnel Administration, 38*(3), 355–377.

Wulantika, L., Ayusari, R. M., & Wittine, Z. (2023). Workload, social support and burnout on employee performance. *Journal of Eastern European and Central Asian Research, 10*(1), 1–8.

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper and Row.

Zhao, Y., Peng, X., Liu, Z., Song, S., & Hansen, P. (2020). Factors that affect asker's pay intention in trilateral payment-based social Q&A platforms: From a benefit and cost perspective. *Journal of the Association for Information Science and Technology, 71*(5), 516–528.

Zulhakim, Z., Suparman, L., & Suryatni, M. (2022). The effect of resilience and social support on the performance of female nurses in Mataram City hospitals with work engagement as a mediation variable. *International Journal of Multicultural and Multireligious Understanding, 9*(6), 485–500.

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Teachers' familiarity with improvisation techniques in science education: Insights from the Zabzugu District, Ghana

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ABSTRACT

This study examines primary school teachers' proficiency in utilising improvisation techniques for science education in the Zabzugu District of Ghana. In resource-constrained environments, improvisation is a crucial strategy to enhance the quality of science education. This research is grounded in two fundamental theoretical frameworks: Constructivist Learning Theory and Pedagogical Content Knowledge (PCK). Using a descriptive survey design, with a target population of 298, data were collected from 196 primary school teachers across seven circuits in the Zabzugu District through stratified sampling. We analysed the data using SPSS version 25, employing descriptive and inferential statistical techniques to address the study's objectives. The study found that teachers generally demonstrate high familiarity with and enthusiasm for improvisation techniques. However, challenges persist, including limited access to training workshops and resources on improvisation. A positive correlation ($r = .376$, $p < .001$, $N = 196$) was found between teachers' familiarity with improvisation techniques and the challenges they face during implementation, suggesting that as teachers become more knowledgeable, they also become more aware of the complexities involved. The findings highlight the potential of improvisation to bridge resource gaps in science education and underscore the need for enhanced teacher training and support in this area. This research contributes to understanding how improvisation techniques can be leveraged to improve science education in resource-limited settings, with implications for educational policy and practice in Ghana and similar contexts globally. This study concludes that the teachers have proficiency and enthusiasm for improvisation in science education. However, enduring challenges require continuous professional development, enhanced access to resources, and focused support from policymakers to elevate teaching quality in resource-limited settings. Recommendations include practical training, collaborative learning, curriculum integration, and gender equity in resource allocation.

Keywords: Improvisation Techniques, Primary Schools, Resource-Constrained Environments, Science Education, Zabzugu District of Ghana

I. INTRODUCTION

As a foundation for technological progress and economic expansion, science education is essential for Ghana's national development. The Ghanaian government has recently acknowledged the significance of science, technology, engineering, and mathematics (STEM) education, enacting multiple efforts to improve its quality and accessibility (Aina & Keith, 2015). The provision of effective science education encounters considerable obstacles, especially in rural regions where resources are frequently limited (Arkorful et al., 2020). In this scenario, teachers play a crucial role in addressing these challenges through improvisation in teaching. Improvisation entails the inventive utilisation of locally accessible materials and novel pedagogical techniques to address resource constraints (Okori & Jerry, 2017). This methodology is especially pertinent in contexts like the Zabzugu District in northern Ghana, where educational institutions often need essential laboratory apparatus and instructional materials (Graham, 2022). The Zabzugu District in Ghana's Northern Region illustrates the resource limitations encountered by numerous rural educational environments nationwide. Primary schools in this district frequently function with inadequate infrastructure and restricted access to traditional science instructional resources (Quansah et al., 2019). These circumstances require inventive strategies from teachers to guarantee that students obtain quality science education despite the absence of institutional resources.

This study examines primary school teachers' awareness in the Zabzugu District regarding improvisation strategies in scientific education. This study investigates teachers' knowledge, attitudes, and practices concerning

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improvisation to elucidate its potential to mitigate resource disparities and improve the quality of science education in rural Ghana (Eshun et al., 2018). Comprehending teachers' improvisation skills is essential for formulating specific interventions and support systems to enhance scientific instruction in resource-limited settings (Akyeampong & Rolleston, 2013). The Zabzugu District in the Northern Region of Ghana illustrates the difficulties encountered by numerous rural educational environments in developing nations. The district's primary schools are characterised by inadequate infrastructure and minimal resources, typically under considerable restraints (Graham, 2022). The region is primarily rural, with numerous schools needing more fundamental infrastructure and instructional resources vital for efficient science education. This situation requires teachers to play a vital role in guaranteeing that students obtain quality science education despite the scarcity of traditional resources (Quansah et al., 2019). Improvisation is essential in science education, especially in resource-limited settings such as Zabzugu District. It entails inventing locally sourced materials and novel pedagogical techniques to address deficiencies in conventional laboratory apparatus and instructional resources (Okori & Jerry, 2017). In science education, improvisation allows teachers to deliver experiential learning opportunities, rendering abstract topics more concrete and comprehensible for students. This method not only fulfils the urgent requirement for educational materials but also cultivates creativity and problem-solving abilities in teachers and students (Eshun et al., 2018).

1.1 Statement of the Problem

The significance of science education in Ghana's national development is well recognized, as it plays a critical role in fostering technological advancement and economic growth (Aina & Keith, 2015). However, primary school teachers in rural regions, such as the Zabzugu District, face substantial challenges in delivering effective science instruction. These challenges are primarily rooted in resource limitations, which hinder students' quality of education. Research indicates that inadequate access to teaching materials, insufficient infrastructure, and a lack of training opportunities severely impact teachers' ability to provide comprehensive science education (Quansah et al., 2019; Graham, 2022).

In this context, improvisation techniques emerge as a beacon of hope, a vital strategy for overcoming these obstacles. Improvisation allows teachers to utilise locally available resources creatively, thus enhancing the teaching and learning experience despite the scarcity of traditional materials. However, the extent to which primary school teachers in the Zabzugu District are familiar with and capable of employing these improvisation techniques remains inadequately explored (Eshun et al., 2018). Understanding teachers' competencies in this area is crucial, as their ability to effectively implement improvisation can significantly influence students' engagement and comprehension of scientific concepts.

This study aims to address this critical knowledge gap by investigating the proficiency of primary school teachers in the Zabzugu District in utilising improvisation techniques for science education. By examining their familiarity with these strategies, the research will shed light on both the potential benefits and barriers teachers face in resource-constrained settings (Nii Akai Nettey et al., 2024). The findings of this study are not just informative, but they are crucial for the future of science education in rural Ghana.

The findings of this study are expected to provide valuable insights that will inform the development of targeted interventions and support systems essential for enhancing science instruction in the region. Such interventions could include professional development programs focused on improvisation techniques, resource allocation strategies, and collaborative networks among teachers. Addressing these needs is not just important, it is urgent for improving the quality of science education in rural Ghana and ensuring that students receive a robust educational foundation that equips them for future challenges (Akyeampong & Rolleston, 2013; Darling-Hammond, 2010).

1.2 Research Questions

i. What is the extent of teachers' familiarity with the procedures for utilising improvisational skills to teach?
ii. What challenges do teachers face when implementing the procedures involved in improvisation skills when teaching Science?
iii. What is the relationship between teachers' familiarity with the procedures involved and the challenges they face during implementation?

II. LITERATURE REVIEW

2.1 Theoretical Framework

This research is grounded in two fundamental theoretical frameworks: Constructivist Learning Theory and Pedagogical Content Knowledge (PCK). These frameworks provide essential insights into the dynamics of teaching and learning, particularly in resource-constrained environments like the Zabzugu District of Ghana.

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Constructivist Learning Theory emphasizes the active role of learners in constructing their understanding and knowledge of the world through experiences. Influential theorists such as Piaget (2013) and Vygotsky (1978) contributed significantly to this theory. Piaget posited that learners progress through stages of cognitive development, indicating that education should be tailored to the student's developmental stage. Vygotsky introduced the concept of the Zone of Proximal Development (ZPD), highlighting the importance of social interaction and cultural context in learning. This framework supports the idea that improvisation in teaching can help bridge gaps in understanding, allowing teachers to utilize locally available resources to create meaningful learning experiences. By fostering an environment where students actively engage and collaborate, teachers can enhance their students' comprehension of scientific concepts, making abstract ideas more concrete.

Pedagogical Content Knowledge (PCK), developed by Shulman (1987), integrates subject matter knowledge with pedagogical skills. PCK underscores the importance of effectively teaching specific content, which is crucial for teachers in resource-limited settings. It emphasizes that teachers must not only understand the science they teach but also how to convey that knowledge in ways that are accessible and engaging for students. This framework is particularly relevant in improvisation, as it equips teachers with the strategies necessary to adapt their teaching methods to overcome challenges posed by limited resources. For instance, teachers proficient in PCK can creatively incorporate improvisational techniques to teach complex scientific concepts using everyday materials, thus enhancing students' learning experiences.

Together, these frameworks not only shed light on the critical role of improvisation in science education, especially in settings where traditional resources are scarce, but also provide practical guidance. They underscore the need for teachers to be versatile and innovative as they navigate the complexities of teaching science in such environments. By understanding and applying these theoretical perspectives, teachers can develop more effective strategies to engage students, promote experiential learning, and ultimately improve educational outcomes.

2.1.1 Alignment with the Study

The study's emphasis on improvisation strategies in science teaching strongly corresponds with the theoretical frameworks of Constructivist Learning Theory and Pedagogical Content Knowledge (PCK), underscoring the importance of its findings to the field of education. Assessing teachers' knowledge and applying improvisation techniques, which involve adapting teaching methods on the spot to address specific learning needs, demonstrates constructivist principles of active, experiential learning, emphasising that students construct their understanding through hands-on experiences (Eshun et al., 2018). This aligns with the notion that effective learning occurs when students engage actively with content, particularly in resource-constrained environments where traditional resources may be lacking.

Examining obstacles teachers encounter in applying improvisation strategies pertains to pedagogical content knowledge, as it encompasses the practical utilisation of subject expertise within limited instructional contexts (Akyeampong, 2017). This framework highlights the necessity for teachers to understand the science they teach and adapt their teaching methods to convey that knowledge in an effective and accessible way. In our study, this adaptability is critical, as teachers must navigate the complexities of improvisation while also addressing the specific needs of their students.

Furthermore, the positive correlation between teachers' familiarity with improvisation and their challenges is consistent with both theories. This indicates that as teachers enhance their pedagogical content knowledge (PCK), they engage with more intricate applications of constructivist learning principles (Frykholm & Glasson, 2005; Hofstein & Mamlok-Naaman, 2007). The finding suggests that increased familiarity improves teaching efficacy and highlights the complexities teachers must navigate in their practice. As teachers become more adept at improvisation, they may also become more aware of the challenges inherent in implementing these techniques effectively.

The study also recommends professional development and resource accessibility to boost teachers' capacity to establish constructivist learning environments by improving pedagogical content knowledge (PCK) (Abakah et al., 2022). By focusing on these areas, the research aligns with the theoretical underpinnings of both frameworks, advocating for a holistic approach to teacher training that integrates improvisation techniques. This approach is essential for enhancing the overall quality of science education in resource-constrained settings.

2.2 Empirical Review

2.2.1 The Extent of Teachers' Familiarity with Improvisation Techniques and Their Application in Teaching Science

A literature review underscores the widespread recognition of improvisation as a potent strategy in science education within resource-limited settings globally. For instance, Adeoye (2019) discovered that improvisation significantly boosted pupils' engagement and comprehension of scientific concepts in rural schools in Nigeria. This finding not only highlights the potential of improvisation to create more engaging learning environments but also

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inspires teachers to enhance student understanding. In the Ghanaian context, Abakah et al. (2022) stressed the indispensability of improvisation in science education, particularly for rural schools. Their study revealed that teachers' ability to improvise could significantly enhance the quality of science instruction in resource-poor settings, indicating a strong familiarity among teachers with improvisational strategies. Furthermore, Yeboah et al. (2019) explored interactive instructional resources in Ghanaian primary schools, finding that locally sourced, improvised materials could make science education more practical and engaging. These studies collectively demonstrate that teachers' familiarity with improvisation techniques is present and effectively applied to improve science education outcomes.

2.2.2 The Challenges Teachers Face When Implementing Improvisation Techniques in Science Education

Despite the advantages of improvisation, implementing these techniques is fraught with challenges. Boakye and Ampiah (2017) identified several obstacles faced by science teachers in Ghana, including a lack of training, time constraints, and limited support from school administration. These challenges underscore the need for a comprehensive understanding of teachers' proficiency in utilising improvisation techniques, particularly in districts like Zabzugu, where the need for such approaches is most acute. Teachers often struggle to integrate improvisation into their lessons due to insufficient professional development opportunities that could enhance their skills. This lack of training can hinder their confidence and effectiveness in applying improvisational strategies, ultimately impacting student learning. Additionally, logistical challenges, such as inadequate access to materials and resources, further complicate the implementation process. It is essential to address these barriers to fully harness the potential of improvisation in science education.

2.2.3 The Relationship between Teachers' Familiarity with Improvisation Techniques and the Challenges They Encounter During Implementation

The relationship between teachers' familiarity with improvisation techniques and their challenges during implementation is an area of critical investigation. The studies by Amponsah et al. (2024a, 2024b) reveal that emotional intelligence, learning styles, and self-efficacy significantly influence academic performance and teaching effectiveness. As teachers become more familiar with improvisational techniques, they may also become more aware of the complexities involved in their application. The positive correlation between familiarity and the identification of challenges is a significant finding that underscores the importance of research in understanding the dynamics of educational quality. This dynamic reflects the intricate interactions of factors influencing educational quality and underscores the urgent need for context-specific measures in Ghana's education system. By understanding these relationships, stakeholders can develop targeted interventions that improve teachers' improvisation skills and provide the necessary support to navigate the challenges that arise in resource-limited environments.

III. METHODOLOGY

3.1 Research Design and Approach

This study employed a descriptive survey research design, which is handy for collecting data on attitudes, experiences, and behaviours from a large population (Cohen et al., 2018). This approach was deemed appropriate for investigating teachers' proficiency in utilising improvisation techniques, as it allowed for gathering quantifiable data and insights into specific challenges within the Zabzugu District's educational framework.

3.2 Sampling Strategy

The study population comprised 298 science teachers from seven circuits within the Zabzugu District, encompassing primary schools (Graham, 2022). The study employed Krejcie and Morgan's (1970) sample size determination table to ensure a representative sample, resulting in a calculated sample of 196 teachers. Considering the number of schools, this sample was distributed across the seven circuits in the district. We utilised a simple random sampling method, ensuring every teacher within the circuits had an equal chance of being selected, thus maintaining a high level of fairness and minimising bias (Creswell, 2014). The final sample comprised 196 teachers, including 167 males (85.2%) and 29 females (14.8%). The sample spanned various age groups, with 38.8% aged 30 years or below, 34.2% between 31-40 years, and 27.0% between 41-50 years.

3.3 Data collection

We collected data through a self-administered questionnaire, a method chosen for its efficiency in collecting large amounts of data within a short period (Cohen et al., 2018). We structured the questionnaire into sections covering demographics, familiarity with improvisation, implementation challenges, and perceptions of effectiveness. It utilised a Likert scale, allowing respondents to indicate their agreement or disagreement with specific statements. To ensure

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the validity and reliability of the research instrument, the questionnaire underwent a rigorous development process. Content validity was established through review by subject experts in science education, who provided feedback on the appropriateness and clarity of the items, ensuring that the questionnaire accurately measures the intended constructs. Furthermore, the questionnaire was pretested with 20 teachers from a neighbouring district, allowing modifications to improve clarity and ensure effective data capture (Creswell, 2014).

3.4 Data Analysis

We assessed the instrument's reliability using Cronbach's alpha, yielding a coefficient of 0.78, which is considered acceptable for social science research (Tavakol & Dennick, 2011). This high reliability coefficient indicates that the instrument had a consistent internal structure and would produce stable results if used repeatedly under similar conditions, thereby enhancing the trustworthiness of the study's findings. We analysed the data using SPSS version 25, employing descriptive and inferential statistical techniques to address the study's objectives. These included descriptive statistics to quantify familiarity and challenges and Pearson correlation to assess relationships.

3.5 Ethical Considerations.

Ethical concerns were of the utmost importance during the research process. Participants were informed about the study's purpose and assured that their identities and personal information would be kept confidential. Before collecting data, the researchers obtained informed consent from the teachers, ensuring that they were not forced to participate in the study. The study adhered to ethical guidelines to ensure that the rights and well-being of all participants were protected.

IV. FINDINGS & DISCUSSION

4.1 Findings

The study's findings provide valuable insights into primary school teachers' familiarity with and utilisation of improvisation techniques in science education within the Zabzugu District, a region known for its unique challenges and opportunities in science education. The results are presented in alignment with the research objectives, focusing on teachers' familiarity with improvisation, their challenges in implementation, and areas of concern. We tackled this familiarity in the three research questions composed for the study.

4.1.1 The Extent of Teachers' Familiarity with Improvisation Techniques and their Application in Teaching Science

This sought to analyse the extent of teachers' familiarity with the procedures for utilising improvisational skills to teach Science in the Zabzugu District. In essence, it looked at the level of awareness, enthusiasm, and practical application of improvisation techniques among primary school teachers. In answering this question, we asked teachers in the Zabzugu District to respond to statements regarding their knowledge, attitudes, and practices related to improvisation in science teaching. Responses ranged from 1- Strongly Disagree, 2-Disagree, 3-Undecided, 4- Agree, 5- Strongly Agree. We interpreted the mean scores as follows: 4.51-5.00 (Strongly Agree), 3.51-4.50 (Agree), 2.51-3.50 (Undecided), 1.51-2.50 (Disagree), and 1.0-1.50 (Strongly Disagree).

Table 1

Teachers' Familiarity with the Procedures for Utilising Improvisational Skills to Teach

S/N	Statement	Mean	SD	Descriptor
1.	I am enthusiastic about improvisation skills.	4.17	.685	4
2.	I often use improvisation skills to teach science subjects.	3.98	.997	4
3.	I have taught several science topics using improved materials.	3.91	1.122	4
4.	The improvisation of primary materials can be an alternative to teaching and learning science.	4.55	.529	5
5.	I encourage students to improvise	4.33	.543	4
6.	I'm aware of the quality of improvisation skills to be used for teaching and learning science	4.29	.632	4
7.	I have attended several improvisation skills workshops since I started my teaching career.	2.96	1.458	3
8.	I have access to several books on improvisation skills.	3.26	1.284	3

Average Mean: 3.932

Average Mean of Standard Deviation: 0.5704

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Table 1 presents the results of teachers' responses regarding their familiarity with improvisation skills in teaching science. The overall mean score of 3.932 (SD = 0.5704) indicates that teachers in the Zabzugu District generally have a high familiarity with improvisation techniques. Teachers reported the highest level of awareness that improvisation of primary materials can be used as an alternative for teaching and learning science (M = 4.55, SD = 0.529). This suggests that teachers recognise the potential of improvisation as a pedagogical strategy and are inspired by its innovative approach, which aligns with findings from Eshun et al. (2018) on the importance of improvisation in resource-constrained educational settings. Encouragingly, teachers also reported high enthusiasm about improvisation skills (M = 4.17, SD = 0.685) and frequently encouraged students to improvise (M = 4.33, SD = 0.543). This positive attitude towards improvisation is crucial for its effective classroom implementation, as Ogunniyi (2013) noted in his study on science education in Africa.

However, the data reveal some areas of concern. Teachers reported lower scores for attending improvisation skills workshops (M = 2.96, SD = 1.458) and accessing sources of books on improvisation skills (M = 3.26, SD = 1.284). These findings suggest a gap in professional development opportunities and resource availability, which could hinder teachers' ability to utilise improvisation techniques fully. This aligns with Akyeampong and Rolleston's (2013) observations on the challenges of teacher preparation in Ghana. The relatively high standard deviations for these items also indicate a wide variation in teachers' experiences with training and resources. This disparity could lead to inconsistent application of improvisation techniques across different classrooms and schools in the district.

Despite these challenges, teachers reported frequently using improvisation skills to teach science subjects (M = 3.98, SD = 0.997) and teaching several science topics with improvised materials (M = 3.91, SD = 1.122). This suggests that teachers incorporate improvisation into their teaching practice, even with limited formal training and resources. However, it also underscores the clear need for more structured professional development and improved access to resources. Addressing these gaps could significantly enhance teachers' proficiency in utilising improvisation techniques, potentially leading to improved science education outcomes in the district.

4.1.2 The Challenges Teachers Face when Implementing Improvisation Techniques in Science Education

This study was conducted to identify and analyse the challenges faced by teachers in the Zabzugu District when implementing improvisation techniques in science education. The understanding of these challenges is not only crucial but also the first step towards developing effective strategies to support teachers in improvisation. Teachers were asked to rate various potential challenges on a scale from 1 (Strongly Disagree) to 5 (Strongly Agree) to address this question. We interpreted the mean scores as follows: 4.51-5.00 (Strongly Agree), 3.51-4.50 (Agree), 2.51-3.50 (Undecided), 1.51-2.50 (Disagree), and 1.0-1.50 (Strongly Disagree).

Table 2

Challenges Teachers Face when Implementing the Procedures involved in Improvisation Skills when Teaching Science

S/N	Statement	Mean	SD	Descriptor
1.	We have limited time planning for practical projects.	4.43	.648	4
2.	Lack of proper funding for teaching materials.	4.54	.733	5
3.	Issues of a large class	4.34	.702	4
4.	Insufficient teaching materials.	4.34	.906	4
5.	Students' reluctance in adopting improvisation skills.	3.64	1.116	4
6.	Poor academic performance of students while using improvisation skills.	3.07	1.411	3
7.	Students' inability to understand improvisation skills.	3.49	1.222	3

Average Mean: 3.979

Average Mean of Standard Deviation: 0.5610

Table 2 presents the outcomes of teachers' feedback on the hurdles they face in incorporating improvisation skills into science instruction. The average score of 3.979 (SD = 0.5610) indicates that teachers often grapple with significant issues when applying improvisation methods. The most pressing concern, as identified by teachers, is the dire need for sufficient funds for instructional materials (M = 4.54, SD = 0.733), a 'Very High' Categorisation. This finding aligns with previous research by Eshun et al. (2018), which highlighted resource constraints as a major barrier to effective science education in rural Ghana. The limited time for planning practical projects emerged as the second most critical challenge (M = 4.43, SD = 0.648), also classified as 'Very High.' This underscores the urgency for teachers to receive support in managing the time-consuming nature of improvisation alongside their regular teaching responsibilities, a challenge underscored by Ayot (2013) in his research on instructional techniques in East Africa.

Challenges related to large class sizes (M = 4.34, SD = 0.702) and insufficient instructional resources (M = 4.34, SD = 0.906) were rated as 'High.' These findings underscore the significant infrastructure and resource limitations faced by schools in the Zabzugu District, as highlighted by Akyeampong and Rolleston (2013) in their study on educational access and quality in Ghana. Notably, student engagement and performance issues received

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lower ratings than resource and preparation challenges. Students' reluctance to acquire improvisation skills (M = 3.64, SD = 1.116) was classified as a 'High' challenge, but poor academic performance (M = 3.07, SD = 1.411) and students' struggle to grasp improvisation skills (M = 3.49, SD = 1.222) were categorized as 'Moderate' problems. The high standard deviations for these items indicate a wide range of experiences among instructors when dealing with student-related issues, underscoring the urgent need to address these resource constraints for improved student performance.

The data suggests that the primary challenges teachers face in implementing improvisation methods are institutional and resource-based, rather than pedagogical or student-centered. To address these issues, it is crucial that interventions at the governmental and administrative levels are implemented. These interventions are likely to be necessary to enhance funding, resource allocation, and time management for scientific education in the Zabzugu District. These findings provide significant insights for educational policymakers and administrators who are committed to improving the effectiveness of science instruction through improvisational strategies in resource-limited environments. Their role in implementing these interventions is crucial and cannot be overstated.

4.1.3 The Relationship between Teachers' Familiarity with Improvisation Techniques and the Challenges they Encounter during Implementation

This study investigated the potential connection between teachers' familiarity with improvisation techniques and the challenges they face when implementing them in science education. Understanding this relationship is crucial for developing targeted interventions and support strategies for teachers. To address this question, a Pearson correlation analysis was conducted between the variables of familiarity and challenges. Table 3 presents the results of the Pearson correlation analysis between teachers' familiarity with improvisation procedures and the challenges they face during implementation. The analysis reveals a statistically significant positive correlation between familiarity and challenges ($r = .376$, $p < .001$, $N = 196$), highlighting the practical implications of these findings for science education and teacher training.

Table 3

Pearson's Correlation between Familiarity and Challenges

Variable	Analysis	Familiarity	Challenges
Familiarity	Pearson Correlation	1	.376
	Sig. (2-tailed)		.000
	N	196	196
Challenges	Pearson Correlation	.376	1
	Sig. (2-tailed)	.000	
	N	196	196
	N	230	

This moderate positive correlation suggests that as teachers' familiarity with improvisation techniques increases, they also report more challenges. This finding aligns with research by Eshiet (2014), who found that teachers with excellent knowledge of improvisation techniques were more likely to identify and report challenges in their implementation. However, this contrasts with Olagunju and Babajide's (2011) study, which suggested that increased familiarity led to fewer perceived challenges. The positive correlation between familiarity and challenges can be interpreted through several lenses. Hofstein and Mamlok-Naaman (2007) noted that increased familiarity often leads to greater awareness of potential challenges in science teaching. As teachers become more adept at improvisation, they may attempt more complex applications, encountering a more comprehensive range of challenges, as Frykholm and Glasson (2005) observed. Akyeampong (2017) highlighted how contextual factors, such as resource constraints, become more apparent as teachers implement their knowledge of improvisation techniques. Furthermore, Loughran (2010) described how more familiar teachers critically reflect on their practice, potentially leading to a higher recognition of challenges. These perspectives collectively suggest that the relationship between familiarity and perceived challenges is multifaceted, reflecting increased competence and a more nuanced understanding of the complexities of implementing improvisation techniques in science education. This emphasis on the multifaceted nature of the relationship should intrigue teachers, researchers, and policymakers about the complexity of the issue.

The strength of the correlation ($r = .376$) indicates a moderate relationship, suggesting that while familiarity and challenges are related, other factors also play significant roles in determining the challenges teachers face. This is consistent with the multifaceted nature of educational challenges described by Darling-Hammond (2010) in her work on educational equity. These findings have important implications for teacher training and support programmes. They suggest that more than simply increasing teachers' familiarity with improvisation techniques may be required to reduce the challenges they face, a conclusion also reached by Adu-Gyamfi et al. (2016) in their study on improvisation in Ghanaian science education. Instead, a more comprehensive approach may be needed, addressing both knowledge

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of improvisation and strategies for overcoming implementation challenges. In conclusion, the positive correlation between familiarity and challenges highlights the complex nature of implementing improvisation techniques in science education. It underscores the need for ongoing support and professional development that not only enhances teachers' knowledge of improvisation but also equips them with strategies to navigate the challenges they are likely to encounter as they apply these techniques in their classrooms. This emphasis on ongoing support should reassure teachers, researchers, and policymakers about the potential solutions to the challenges, a recommendation echoed by Okebukola and Jegede (2016) in their research on improvisation in Ghanaian schools.

4.2 Discussion

The findings of this study offer significant insights into the state of improvisation in science education within the Zabzugu District, revealing both encouraging trends and areas requiring attention.

The findings reveal a high level of familiarity and enthusiasm amongst teachers regarding improvisation techniques in the Zabzugu District. With an overall mean familiarity score of 3.932 out of 5, teachers demonstrate a strong awareness of improvisation as a viable teaching strategy. This aligns with Eshun et al.'s (2018) findings on teachers' adaptability in deprived areas of Ghana, where they found similar levels of familiarity and enthusiasm. Similarly, Okebukola and Jegede (2016) found that teachers in resource-constrained environments often display a high awareness of improvisation as a necessary skill, a finding that resonates with our research. The exceptionally high score (4.55) for recognising improvisation as an alternative for teaching science suggests teachers are cognisant of its potential to bridge resource gaps. This recognition aligns with Asano et al. (2021) assertion that improvisation is crucial for effective science education in rural Ghanaian schools. Teacher enthusiasm (mean score 4.17) is especially promising, indicating a positive attitude towards innovative teaching methods. As Akyeampong (2017) notes, teacher motivation is key in adopting new pedagogical approaches. This enthusiasm contrasts with findings by Adewara and Lawal (2015), who reported lower enthusiasm levels among teachers in some Nigerian schools, possibly due to contextual differences. The high frequency of using improvisation (mean 3.98) further suggests teachers are actively applying their knowledge in the classroom, consistent with Asano et al. (2021) and Yeboah et al.'s (2019) observations in other Ghanaian primary and junior high schools.

Despite high familiarity and enthusiasm, there is a notable gap between teachers' awareness and access to training and resources. Lower scores for attending workshops (2.96) and access to resources on improvisation (3.26) highlight significant challenges in implementation. This echoes Boakye and Ampiah's (2017) findings, identifying lack of training and resources as significant obstacles for science teachers in Ghana. Similarly, Obodo et al. (2020) found that adequate professional development opportunities could have improved effective improvisation in Nigerian schools. The gap suggests that while teachers recognize improvisation's value, they may need more practical skills and materials for effective implementation. This disparity between theoretical knowledge and practical application could limit improvisation's impact on science education in the district. This challenge is expected in Ghana; Kambuga (2024) reported similar issues in Tanzania, where teachers struggled to translate their awareness into effective classroom practices due to resource constraints. However, these findings contrast with Moomaw's (2024) study in Uganda, which found that teachers could overcome resource limitations more effectively, possibly due to differences in local support systems or cultural factors.

A Pearson correlation analysis revealed a statistically significant positive correlation between familiarity and challenges ($r = .376$, $p < .001$, $N = 196$), suggesting that as teachers become more familiar with improvisation techniques, they also report more challenges. This enlightening finding aligns with Eshiet's (2014) observation that more expert teachers are likelier to identify a broader range of implementation challenges. Similarly, Githui et al. (2022) found that experienced teachers in Kenya reported more nuanced challenges in improvisation, indicating a deeper understanding of the complexities involved. However, it contrasts with Olagunju and Babajide's (2011) argument that familiarity should reduce perceived challenges. This discrepancy might be explained by contextual differences or variations in how challenges are defined and measured across studies. The positive correlation can be interpreted through various perspectives: Hofstein and Mamlok-Naaman (2007) suggest increased familiarity brings heightened awareness of potential difficulties; Frykholm and Glasson (2005) note that more familiar teachers attempt more complex techniques; and Akyeampong (2017) argue that contextual factors become more apparent with deeper engagement. Additionally, Mushimiyimana et al. (2022) found that teachers with higher familiarity levels in Rwanda tended to innovate more, potentially encountering new challenges in the process. This supports our finding that increased familiarity correlates with more reported challenges. The moderate strength of the correlation indicates that whilst familiarity and challenges are linked, other factors also play significant roles in shaping teachers' difficulties. This multi-faceted nature of challenges in improvisation is consistent with Darling-Hammond's (2010) broader observations on the complexity of educational innovations in resource-constrained environments.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study on primary school teachers' proficiency in utilising improvisation tactics for scientific instruction in the Zabzugu District has revealed important findings regarding the current state of science education in resource-constrained environments in Ghana. Teachers demonstrate considerable expertise and enthusiasm for improvisation techniques, particularly recognising improvisation as an effective approach for teaching science. Significant challenges in implementation persist, especially with workshop attendance and resource availability, highlighting a gap between theoretical comprehension and practical application. This study demonstrates a substantial correlation between teachers' proficiency in improvisation techniques and the challenges faced during implementation. This signifies that as teachers deepen their comprehension of improvisation, they concurrently become cognisant of the complexities involved in its execution. This relationship underscores the imperative for ongoing assistance and professional development, a duty to which policymakers should be dedicated, enhancing teachers' comprehension of improvisation and equipping them with resources to tackle anticipated challenges. These findings highlight the significant potential of improvisation to enhance science teaching, particularly in resource-constrained environments. To leverage this potential, educational policymakers and administrators advocate for the enhancement of professional development, improved resource accessibility, promotion of collaborative learning, integration of improvisation into curricula, allocation of targeted funding, and execution of regular effectiveness evaluations. Despite persistent challenges, the substantial expertise and enthusiasm of teachers create a strong basis for the effective integration of improvisation in science instruction. This should ensure policymakers and administrators that, with appropriate support, the quality of scientific education in resource-constrained environments can be significantly enhanced, perhaps creating a model for similar situations across Ghana and beyond.

5.2 Recommendations

To maximise the potential of improvisation in science education, policymakers and administrators should enhance professional development programmes focused on practical improvisation skills, improve access to resources and materials, foster collaborative learning environments amongst teachers, and integrate improvisation into science curricula and teacher education programmes. Additionally, allocating targeted funding for improvisation materials and training, conducting regular assessments to evaluate effectiveness, and promoting gender equity in access to training and resources are crucial. These strategies aim to address identified gaps and leverage teachers' enthusiasm, potentially improving science education quality in resource-constrained environments.

Disclosure statement

The researchers affirm that there was no conflict of interest throughout the study.

REFERENCES

Abakah, E., Widin, J., & Ameyaw, E. K. (2022). Continuing professional development (CPD) practices among basic schoolteachers in the Central Region of Ghana. *Sage Open, 12*(2), 21582440221094597.

Adeoye, F. A. (2019). Improvisation in science teaching: Nigerian case study. *Nigerian Journal of Science Education, 15*(2), 112–124.

Adewara, J. A., & Lawal, R. O. (2015). Teacher improvisation skills and student academic performance in physics in Ilorin Metropolis, Nigeria. *African Journal of Educational Studies in Mathematics and Sciences, 11*(5), 125–132.

Adu-Gyamfi, K., Donkor, F., & Addo, E. (2016). Teacher support programmes in Ghana and their impact on classroom practices. *Journal of Education Development, 15*(2), 45–57.

Aina, J. K., & Keith, B. (2015). Science education in Nigeria: An overview. *American Journal of Educational Research, 3*(12), 1551–1555.

Akyeampong, K. (2017). Teacher preparation in Africa: Lessons from the T-TEL Programme in Ghana. *Oxford Review of Education, 43*(3), 289–304.

Akyeampong, K., & Rolleston, C. (2013). Improving educational access and quality in Ghana and Kenya: Research, policy, and practice. *Comparative Education Review, 57*(2), 297–316.

Amponsah, K. D., Adu-Gyamfi, K., Awoniyi, F. C., & Commey-Mintah, P. (2024). Navigating academic performance: Unravelling the relationship between emotional intelligence, learning styles, and science and technology self-efficacy among preservice science teachers. *Heliyon, 10*(9), e29474. https://doi.org/10.1016/j.heliyon.2024.e29474

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Amponsah, K. D., Salifu, I., Yeboah, R., & Commey-Mintah, P. (2024b). Emotional intelligence and academic performance: How does the relationship work among pre-service teachers in Ghana? *Cogent Education, 11*(1). https://doi.org/10.1080/2331186X.2024.2305557

Arkorful, V. E., Basiru, I., Anokye, R., Latif, A., Agyei, E. K., Hammond, A., & Abdul-Rahaman, S. (2020). Equitable access and inclusiveness in basic education: Roadblocks to sustainable development goals. *International Journal of Public Administration, 43*(3), 276–287.

Asano, R., Amponsah, K. D., Baah-Yanney, O., Quarcoo, F., & Azumah, D. A. (2021). Using quality teaching and learning resources for effective integrated science education among senior high schools in Ghana. *Education Quarterly Reviews, 4*(3), 51–63.

Boakye, C., & Ampiah, J. G. (2017). Challenges and solutions: The experiences of newly qualified science teachers. *Sage Open, 7*(2), 2158244017706710.

Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education, 61*(1–2), 35–47.

Eshiet, I. T. (2014). Teachers' improvisation in science teaching: Challenges and prospects. *Science Education Review, 13*(4), 298–310.

Eshun, B., Dogbey, G. Y., & Ntim, S. (2018). Teachers' use of improvisation in teaching science in deprived areas of Ghana: A case study of selected schools in the Central Region. *International Journal of Educational Research and Development, 10*(1), 27–38.

Frykholm, J., & Glasson, G. (2005). Connecting science and mathematics instruction: Pedagogical contexts that enhance student learning. *School Science and Mathematics, 105*(3), 127–141.

Githui, M. W., Koech, P. K., & Thinguri, R. (2021). Influence of teachers' improvisation of heat-producing materials on acquisition of science skills among pre-primary school learners in Kiambu, Kenya. *Journal of Education, Society and Behavioural Science, 34*(9), 61–70.

Graham, F. (2022). Challenges of circuit supervisors in supervising underserved public schools in the Awutu Senya West District (Doctoral dissertation, University of Education, Winneba).

Hofstein, A., & Mamlok-Naaman, R. (2007). The laboratory in science education: The state of the art. *Chemistry Education Research and Practice, 8*(2), 105–107.

Kambuga, Y. M. (2024). Teacher improvisation skills in enhancing teaching and learning process in pre-primary schools in Tanzania. *Futurity Education, 4*(1), 98–109.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610.

Loughran, J. (2010). *What expert teachers do: Enhancing professional knowledge for classroom practice*. Routledge.

Moomaw, S. (2024). *Teaching STEM in the early years: Activities for integrating science, technology, engineering, and mathematics*. Redleaf Press.

Mushimiyimana, D., Kampire, E., & Dushimimana, E. (2022). Impacts of improvised instructional materials on grade nine learners' performance in chemistry. *African Journal of Educational Studies in Mathematics and Sciences, 18*(1), 127–135.

Nii Akai Nettey, J., Osei Mensah, R., Asafo-Adjei, R., & Adiza Babah, P. (2024). Analyzing the challenges basic school teachers face in integrating information and communication technology into teaching and learning activities in a developing country. *Cogent Education, 11*(1). https://doi.org/10.1080/2331186X.2024.2364544

Obodo, A. C., Ani, M. I., & Thompson, M. (2020). Effects of improvised teaching-learning materials on the academic performance of junior secondary school students in Basic Science in Enugu State, Nigeria. *IOSR Journal of Research & Method in Education, 10*(4), 23–30.

Okebukola, P., & Jegede, O. (2016). Improvisation in science teaching: The Nigerian experience. In *Research in science education in Africa: Past, present, and future* (pp. 107–119). Routledge.

Okori, O. A., & Jerry, O. (2017). Improvisation and utilization of resources in the teaching and learning of science and mathematics in secondary schools in Cross River State. *Global Journal of Educational Research, 16*(1), 21–28.

Olagunju, A. M., & Babajide, V. F. T. (2011). Investigating science teachers' needs for effective improvisation in science teaching. *Journal of Science Teacher Education, 22*(1), 79–90.

Piaget, J. (2013). *The construction of reality in the child*. Routledge.

Quansah, R. E., Sakyi-Hagan, N. A., & Essiam, C. (2019). Challenges affecting the teaching and learning of Integrated Science in rural junior high schools in Ghana. *Science Education International, 30*(4), 329–333.

Licensed Under Creative Commons Attribution (CC BY-NC)

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1–22.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*(5), 53–55.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Yeboah, R., Abonyi, U. K., & Luguterah, A. W. (2019). Making primary school science education more practical through appropriate interactive instructional resources: A case study of Ghana. *Cogent Education, 6*(1), 1611033.

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Harnessing technology for strategic HR alignment: Lessons from selected Tanzanian ministries, independent departments and agencies

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ABSTRACT

This study investigated technology's role in advancing Strategic Human Resource Alignment in Tanzanian Ministries, Independent Departments, and Agencies (MDAs), focusing particularly on emergent Information Systems, Leadership Commitment, and Institutional Readiness. Guided by the Resource-Based View (RBV) and Contingency Theory, the study theorizes these constructs as critical organizational resources and contextual factors influencing the alignment of HR practices and institutional goals. The study adopted a cross-sectional survey design, which was quantitative in nature. HR managers, line managers, and IT managers in selected MDAs constituted the study population. Through the application of purposive sampling, 111 respondents were targeted, and 104 usable responses were obtained, representing a response rate of 93.7%. Data was collected using structured questionnaires, and hypotheses were tested through the application of Structural Equation Modeling (SEM). The findings show that strategic human resource alignment is significantly facilitated by the use of emerging information systems, with leadership commitment and institutional readiness also exerting strong direct effects. The explanatory model demonstrated high variance in strategic human resource alignment and confirmed its predictive validity. These findings confirm RBV's contention that human capital and technology are strategic resources, while contingency theory emphasizes organizational fit as a condition for alignment effectiveness. Theoretically, the study adds to digital HR transformation knowledge by illustrating how new information systems, leadership, and institutional readiness together enhance alignment in the public sector. Practically, it offers lessons for MDAs: technological investments must be followed up with leadership commitment and organizational preparedness so that HRIS implementation can contribute to strategic results and national development agendas. The results emphasize the need to adopt a synergistic strategy: technological implementation should be followed by aggressive leadership backing and good organizational preparedness. Managers and policymakers need to accord topmost priority to creating capacity, training leaders, and infrastructure so that HRIS could make a stronger strategic impact. On theoretical contributions, this study adds to theoretical understanding by resolving the conflict between the Resource-Based View (RBV) and Contingency Theory, demonstrating that new information systems as strategic assets appreciate only when supported by leadership and institutional readiness. In showing how alignment comes out of the interaction between resources within the organization and conditions within the context.

Keywords: Emerging Information Systems, Leadership Commitment, Institutional Readiness, Public Sector, Strategic Human Resource Alignment

I. INTRODUCTION

Worldwide, the Human Resource [HR] practices' alignment with organizational goals is increasingly seen as a key institutional performance and sustainable improvement driver (García-Cruz *et al*., 2024; Martins & Moreira, 2025). In the African public sector, alignment of such HR functions has been found to enhance organizational performance and employee retention (Gandi & Saurombe, 2025). Carrying this focus to Tanzania, Ministries, Independent Departments, and Agencies (MDAs) are under pressure to align HR plans with national development plans on such platforms as technological systems such as Human Resource Information Systems (Matimbwa & Olatokun, 2024). Digitalization, when applied to bring together via information systems into the management of human resources, has revolutionized the process by which organizations hire, administer, and retain personnel and align workforce abilities and strategic aims (Adias, 2025; Arora *et al*., 2024). It is not a phenomenon in developed

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economies alone; developing nations also go for digital platforms to enhance public services and increase accountability (Djatmiko *et al*., 2025; Latupeirissa *et al*., 2024).

In Africa, technological intervention has been at the center of public sector reforms in redefining HR functions in response to increasing demands for efficiency, transparency, and service delivery. Some countries have also adopted HR information systems, e-governance platforms, and decision-support software to reverse structural inefficiencies and gaps in staff administration (Sharmin & Chowdhury, 2025; Udoh, 2024). Even so, although the momentum is picking up, the progress is uneven, and institutions find it challenging to incorporate the technologies into strategic planning and organizational transformation (Udoh, 2024). Tanzania is a case in point.

Ministries, Independent Departments, and Agencies (MDAs) shall harmonize HR plans with national development objectives to improve service delivery and accountability (Tandika, 2024). The Public Sector Reform Programme and national e-Government strategies have made tremendous strides by the government in encouraging the utilization of Human Resource Information Systems (HRIS) and other related digital tools for boosting workforce management. These reforms seek to reorient HR functions from administrative to strategic partners in institutional performance. However, ground reality outlines persistent issues: weak digital infrastructure, fragmented platforms, lack of integration of HR systems with strategic planning, and bureaucratic opposition curtail the maximum potential of HRIS adoption (Gange & Barongo, 2024; Matimbwa & Olatokun, 2024). Such challenges hinder the contribution of HR to organizational change, hence inefficiencies in talent management and accountability lapses (Otoo *et al*., 2022). This study is based on the Resource-Based View (RBV) where technological infrastructure and human capital are recognized as strategic resources that generate institutional benefit when they are adequately leveraged (Tandika, 2024; Willie, 2025).

Backed by this, Contingency Theory posits organizational performance is dependent on alignment or fit between internal capacity and environmental requirements (Chourasia & Bahuguna, 2024; Hentati *et al*., 2025). Guided by these perspectives, the research explores how HRIS adoption, leadership commitment, and institutional Readiness influence strategic HR alignment in Tanzanian MDAs. By this, the study contributes to the understanding of what digital transformation can contribute to public sector human resource management and offers valuable lessons for policy and reform.

1.1 Statement of the Problem

Though Human Resource Information Systems (HRIS) and other electronic platforms have been installed in Tanzania's Ministries, Independent Departments, and Agencies to increase efficiency, responsibility, and harmonization of human resources with national development priorities, their strategic contributions are minimal. Unplowed issues such as lack of proper technological infrastructure, fragmented systems, lack of alignment with strategic planning, and resistance to change have made HR functions largely administrative rather than strategic, thus limiting talent management, transparency, and organizational performance. Drawing on the Resource-Based View and Contingency Theory, this study bridges the significant knowledge gap of understanding how emerging information systems, leadership commitment, and institutional readiness influence strategic HR alignment in Tanzanian MDAs that is relevant to sustainable public sector reforms and improved service delivery.

1.2 Research Objectives

i. To determine the effect of emerging information systems on strategic HR alignment in Tanzanian MDAs.
ii. To assess the influence of leadership commitment on strategic HR alignment in Tanzanian MDAs.
iii. To evaluate how institutional readiness shapes strategic HR alignment in Tanzanian MDAs.

1.3 Research Hypotheses

Ho_1: Emerging Information Systems positively influence strategic HR alignment in Tanzanian MDAs.
Ho_2: Leadership commitment positively influences strategic HR alignment in Tanzanian MDAs.
Ho_3: Institutional readiness positively influences strategic HR alignment in Tanzanian MDAs

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Resource-Based View

The Resource-Based View (RBV) foresees the long-term success of an organization depending on its ability to obtain and utilize valuable, rare, difficult to imitate, and non-substitutable resources (Barney, 1991). In human resource management, this perspective emphasizes that technological equipment, skilled employees, and well-aligned processes are strategic resources that can improve organizational performance (Terfa *et al*., 2025) Emerging digital HR systems, such as Human Resource Information Systems (HRIS) and predictive analytics software, are prime examples of such strategic assets because they enable HR departments to integrate workforce planning, monitor

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performance, and support data-driven decision-making (Okon *et al*., 2024). For Tanzanian Ministries, Independent Departments, and Agencies (MDAs), effective adoption and adaptation of such systems permit HR to transition from predominantly administrative functions to a strategic role in direct support of organizational objectives.

RBV also demands complementary assets that enhance the value of the technological assets. Leadership commitment ensures HR initiatives clear direction, adequate resources, and sustained support, while institutional Readiness comprising infrastructure, workforce skills, and change management capability enables effective use of digital systems. In this case, HRIS and related tools are not just operational systems but strategic capabilities that, under leadership commitment and Readiness, can achieve substantial alignment between HR practices and organizational goals. This perspective provides theoretical support to the study hypotheses that argue that new information systems, leadership commitment, and institutional Readiness will positively impact strategic HR alignment.

2.2 Contingency Theory

Contingency Theory (Fiedler, 1967) argues that organizational effectiveness is a function of the fit between internal practices and external or contextual variables, rather than the application of a single best practice (Fiedler, 1967). In HR management, it therefore suggests that the impact of digital HR technologies, leadership practices, and organizational Readiness is a function of the degree to which they fit the structure, culture, and environment of the organization (Amoako *et al*., 2021). Successful implementation of emerging HR systems for Tanzanian MDAs depends on their compatibility with national policies, organizational frameworks, and employee capacities. This perspective partially accounts for the argument that technology alone is not automatically going to improve HR alignment; its success depends on the broad organizational environment.

Theory also brings out the combined impact of leadership and institutional Readiness in achieving strategic outcomes. Leaders play an important part in charting HR strategies to organizational realities and creating a culture that can sustain the adoption of technology (Bozkus, 2023). On the other hand, institutional Readiness ensures the organization has the infrastructure, competencies, and processes required to successfully utilize digital systems. Contingency Theory thus confirms the study's hypotheses by highlighting that the effectiveness of emerging information systems, leadership commitment, and institutional Readiness in enabling strategic HR alignment depends on their alignment with organizational and contextual factors (Siddique *et al*., 2025).

2.3 Empirical Review

2.3.1 Global context of Technology for Strategic HR Alignment

Recent empirical work highlights the transformative capability of emerging digital HR technologies to drive strategic HR alignment and overall HR effectiveness. Savitri *et al*. (2024) state that Human Resource Information Systems (HRIS) are imperative tools to deal with employee performance. Their evaluation shows that HRIS increases the quality and effectiveness of performance appraisals, offers formal and regular feedback, supports career planning, and supports increasing employee satisfaction and retention. By automating administrative activities while directly contributing to performance management, HRIS enables HR functions to be more tightly coupled with overall organizational objectives, situating technology as a strategic enabler and not merely an administrative vehicle.

To complement these results, Obeta and Edwin (2025) provide insight into the function of digital governance in public sector organizations and demonstrate that digital platforms significantly introduce transparency, accountability, and operating efficiency into HRM practices. Their findings reveal that the integration of digital governance devices increases the credibility and responsiveness of HR processes and supports building a culture of accountability along with making HR functions respond more effectively to organizational strategic priorities. Collectively, the studies indicate that when properly rolled out and positioned, digital HR technologies support usual HR activities as well as support strategic alignment by linking HR practice to organizational performance, institutional accountability, and workforce development objectives.

Hossain *et al*. (2025) bring to light the role shift potential of predictive analytics in Human Resource Information Systems (HRIS) to strategic HR management innovation. Their overview demonstrates that predictive HRIS transforms HR planning from static, reactive systems to proactive, evidence-driven decision-making, enabling more accurate talent forecasting, workforce optimization, and succession planning. Organizations that leverage such tools realize measurable improvements in internal mobility, attrition control, and building leadership pipelines.

The study also highlights the point that predictive HRIS effectiveness depends heavily on robust technological foundation, including cloud-based technology, middleware, and integration. Technical proficiency being aside, successful rollout requires consideration for ethics and law, e.g., data privacy, surveillance of employees, and algorithmic fairness. Hossain *et al*. (2025) further state that adoption and influence vary geographically and by industry depending on variations in regulatory climates, organizational culture, and endowments of resources. The review shows predictive HRIS to be a viable strategic enabler. However, its worth depends on appropriate

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technological Readiness, ethical governance, and contextual adaptation to make the broader relevance of connecting emergent information systems with organisational strategy worthwhile.

While such findings form the basis of the positive influence of emergent information systems, some scholars present a more cautious perspective. López-Cabarcos *et al*. (2022) note that off-the-shelf HRIS, if not adapted to the organizational context, may hinder strategic alignment, particularly in complex public sector settings. Thomas (2024) also points out that socio-technical forces such as power relations and informal networks decisively influence technology adoption performance and suggests that alignment can't be helped by technology. Together, these results form the basis of H1, which states that developing information systems positively affect strategic HR alignment in Tanzanian MDAs.

Leadership Commitment and Institutional Readiness have remained major determinants that shape the success of e-HR programs. Studies by Siddique *et al*. (2025), Sofi *et al*. (2025) and Chathuranga (2024) assert that committed leadership amplifies the positive effect of HRIS implementation by fostering a supportive culture, putting resource prioritization at the helm, and ensuring technology-driven HR process accountability. Conversely, Omowole *et al*. (2024) and Tjorko and Tan (2025) argue that digitally well-funded projects will fail if leaders do not become actively involved in advocating for change, adding the proactive dimension. With respect to institutional Readiness, Ogbe and Uchechukwu (2024) and Tayade (2025) illustrate that infrastructure, HR digital capability, and organizational change management are crucial towards the success of HRIS benefits. In contrast, Musungwini *et al*. (2025) state that legacy systems, scattered platforms, and capability gaps typically impede fruitful adoption. Gange and Barongo (2024) further contend that technology-supported reforms in Tanzanian MDAs sometimes are more enacted to address compliance requirements than strategic intentions, hindering concrete HR correspondence improvements. These findings confirm H_2 and H_3, indicating that leadership commitment and institutional Readiness positively influence the relationship between HRIS adoption and strategic HR alignment. By integrating these constructs, the research highlights the interdependence of technology, leadership, and institutional context toward achieving sustainable HR transformation.

This convergence suggests that the success of e-HR interventions depends on context adaptation, organizational dedication, and alignment with strategic priorities. As a result, the review highlights the importance of emergent information systems, leadership commitment, and institutional Readiness as factors associated with determining how technology is equalled to advanced strategic HR performance in public sector settings, like Tanzanian MDAs.

2.3.2 Technology for Strategic HR Alignment in Tanzania

Tanzania's public sector has increasingly spearheaded its digital transformation agenda through initiatives such as the Public Sector Reform Programme (PSRP) and national e-Government plans intended to transform service delivery as well as increase accountability (Chewe *et al*., 2025; Kibira, 2024). Of these reforms, Human Resource Information Systems (HRIS) and other new information systems have led the way in changing HR management practices. These technologies are not only intended to drive administrative inefficiencies away but also to enhance data integrity, build workforce transparency, and provide evidence for strategic decision-making (Mdhlalose, 2025; Otoo *et al*., 2022; Wang, 2024). The shift from paper-based disintegrated and fragmented records to integrated digital platforms reflects an expanded appreciation of HR's evolving role from transactional facilitation to a strategic partner in institutional achievement (Bahari, 2025).

Nevertheless, Tanzanian MDAs continue to face considerable challenges in unlocking the revolutionary potential of such systems. Shoddy digital infrastructure, low interoperability of platforms, and lacking ICT skills among HR personnel are the persistent barriers (Mwakwabe, 2023; Mwogosi, 2023). Furthermore, the strategic value of HRIS is often compromised by inadequate technology adoption aligning with organizational planning procedures. In other MDAs, investment in HR technology has not been followed by matching efforts to integrate HR information into strategic decision-making, undermining the ability of HR to shape workforce development and performance results (Dominic & Rutenge, 2024).

Digital HR transformation is also highly reliant on leadership support (Febrianti & Jufri, 2022; Purwanto *et al*., 2023). Leadership facilitates technology change through investing, raising capital, and establishing the type of culture that fosters innovation (Awashreh, 2025). Without overt and sustained leadership involvement, HRIS adoption may just turn out to be a compliance exercise rather than a driver of strategic alignment. Similarly, institutional Readiness in terms of digital literacy, organizational culture, regulatory framework, and change management capability is critical in assuring technology initiatives yield long-term outcomes (Tasleem *et al*., 2023). Institutions with a deficiency in appropriate digital change readiness find themselves facing resistance, talent shortages, and disintegrated implementation that all limit the potential for HR systems to contribute meaningfully to strategic objectives.

From the Resource-Based View (RBV) point of view, HR competencies and information systems may be treated as rare and inimitable skills that, if utilized effectively, generate long-term competitive advantage (Assensoh-

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Kodua, 2019; Willie, 2025). Technology, however, is insufficient as per Contingency Theory. Its success depends upon compatibility with organizational culture, leadership vision, and external institutional forces (Issah *et al*., 2024; Müller *et al*., 2024). To Tanzanian MDAs, this implies that technological capacity building must go hand in hand with leadership commitment development and institutional Readiness. Digital HR tools will only shift from administrative tools to strategic public sector performance enablers and national development goal drivers (Agwoje & Okeleke, 2023).

III. METHODOLOGY

3.1 Research Design and Procedures

The present study applied a quantitative research approach to examine how technology facilitates strategic HR practices alignment within the selected Tanzanian MDAs. The approach enabled quantifying relationships between significant variables, i.e., the influences of emerging Information Systems (IS), leadership commitment (LC), and institutional Readiness (IR) on strategic HR alignment.

Independent variables are Human Resource Information Systems (IS), Institutional Readiness (IR), and Leadership commitment (LC). Strategic HR alignment (HA) is the dependent variable that is realized by embedding HR practices within organizational planning, HR decisions supported by data, and aligning with institutional performance targets. Leadership commitment and institutional Readiness are also included in the research to reflect the complex dynamics that influence technology adoption and impact.

Drawing on Contingency Theory and the RBV, study design informed the development of a formal questionnaire among HR managers, IT officials, and strategic planners in selected MDAs. Data collection involved disseminating the closed-ended questionnaire survey electronically and hard copy and capturing perception regarding technological sufficiency, leadership support, institutional Readiness, and HR strategic outcomes.

3.2 Data and Sample and Research Instruments

The targeted population comprised personnel in HR management, IT administration, and strategic planning across selected Tanzanian MDAs with active digital transformation initiatives. **A** purposive sampling technique identified relevant MDAs to ensure the sample's relevance to the research objectives. In these organizations, stratified sampling was thereafter used to ensure diverse representation across HR, IT, and planning functions. One hundred four (104) completed questionnaires were obtained, representing a response rate exceeding 93.7%, which is considered strong for public sector organizational research. In terms of data and instruments, data were collected through a structured questionnaire developed from established literature on HRIS adoption, leadership influence, institutional Readiness, and strategic HR alignment the instrument comprised sections on demographics, Human Resource Information Systems, leadership commitment, institutional Readiness, and strategic HR outcomes.

Items were measured on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree) to capture detailed respondent perceptions. The questionnaire was piloted with a small group of public sector HR professionals to assess clarity, relevance, and validity. Feedback from the pilot was used to refine wording and improve measurement precision.

3.3 Techniques of Data Analysis

Data were processed using SPSS Version 27 for preliminary screening, including checks for missing data, outliers, and normality. Missing values were handled using linear interpolation, while outliers were examined via boxplots and addressed appropriately to maintain data integrity. Given multiple latent constructs and complex relationships, Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed using SmartPLS software. This technique supports simultaneous evaluation of the measurement and structural models, suitable for theory testing and prediction in social science research (Hair *et al*., 2021).

3.4 Outer Model Evaluation

The outer model evaluation assesses the relationship between each indicator and its corresponding latent construct, ensuring the measurement model's validity and reliability. In Partial Least Squares Structural Equation Modeling (PLS-SEM), two types of measurement models exist: reflective and formative indicators, each requiring specific evaluation criteria (Hair *et al*., 2021).

Reflective indicators were assessed based on convergent validity and internal consistency reliability. Convergent validity is confirmed when indicator factor loadings exceed 0.70 (Cheung *et al*., 2024) indicating that the indicators adequately represent the underlying latent construct. Additionally, discriminant validity is assessed through the Average Variance Extracted (AVE) (Rönkkö & Cho, 2022) with values greater than 0.50 demonstrating that a construct explains more than half of the variance of its indicators. Internal consistency reliability is evaluated using

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Cronbach's alpha and composite reliability, both of which should surpass the threshold of 0.70 to confirm that the indicators consistently measure the construct.

In contrast, formative indicators are examined for multicollinearity among indicators to ensure they provide unique information to the construct. This is evaluated using the Variance Inflation Factor (VIF), where values below 5 indicate an absence of problematic multicollinearity. Should high multicollinearity be detected (VIF > 5), remedial actions, such as removing or combining indicators with low VIF, are recommended to improve measurement quality. This comprehensive evaluation ensures that each latent construct is accurately and reliably measured, providing a solid foundation for subsequent structural model analysis.

3.5 Inner Model Evaluation

The inner model evaluation examines the hypothesized relationships among the latent constructs within the structural model. This assessment determines how well the independent variables, such as HR Information Systems, leadership commitment, and institutional Readiness, explain variations in the dependent variable, strategic HR alignment.

A key metric for evaluating the inner model's predictive accuracy is the coefficient of determination (R^2), which indicates the proportion of variance in the endogenous construct explained by the exogenous variables. Following Purwanto *et al.* (2021), R^2 values are interpreted as follows: An R^2 of 0.19 signifies a weak explanatory effect, an R^2 of 0.33 indicates a moderate impact, and an R^2 of 0.67 or higher reflects a substantial effect on the endogenous variable. In addition to R^2, path coefficients were analyzed to determine the direction (positive or negative) and strength of the relationships between constructs (Ahmed, 2024). These coefficients represent standardized regression weights that reflect the magnitude of influence that predictors (HR Information Systems, leadership commitment, institutional Readiness) exert on strategic HR alignment. The significance of these paths is tested to confirm or reject the proposed hypotheses, providing insights into the direct, moderating, and mediating effects within the model. This comprehensive evaluation of the inner model ensures that the theoretical framework's explanatory power and relational assumptions are empirically supported**.**

3.6 Hypothesis Testing

Hypothesis testing was conducted to determine whether to accept or reject the proposed hypotheses based on statistical evidence. Using a 5% significance level ($p < 0.05$), the study employed bootstrapping procedures with 5,000 resamples in SmartPLS to assess path coefficients and their significance within the structural model. A hypothesis was accepted if the path coefficient was positive (greater than zero) and the corresponding p-value was less than 0.05, indicating a statistically significant positive relationship. Conversely, hypotheses could have been rejected if the path coefficient was negative or the p-value exceeded 0.05, reflecting a lack of substantial or adverse effect. The tested hypotheses included the direct influence of emerging Information systems on strategic HR alignment (H1), the influence of leadership commitment on strategic HR alignment (H2), and the influence of institutional Readiness on strategic HR alignment (H3). This rigorous testing approach enabled a thorough evaluation of direct influences, providing deeper insight into how technology, leadership, and organizational Readiness affect strategic HR alignment.

IV. FINDINGS & DISCUSSION

4.1 Measurement Model Assessment Factor Loadings

The measurement model was tested for convergent validity to determine whether each indicator adequately captures its respective specified latent construct. This was crucial in confirming that Emerging Information Systems (IS), Leadership Commitment (LC), Institutional Readiness (IR), and Strategic HR Alignment (HR) dimensions were accurately measured before hypothesis testing. To achieve this, the study applied Partial Least Squares Structural Equation Modeling (PLS-SEM), which can manage complex relations with multiple constructs and indicators. In particular, PLS-SEM infers outer loadings for reflective indicators to confirm their effect on the measured constructs. The cutoff level set for indicator loading is 0.50, whereby each item loading above this value makes an important contribution in explaining its associated construct's variance.

The results showed that all the indicators in the study had loadings ranging from 0.614 to 0.884, which was beyond the minimum threshold. This finding substantiated that each of the indicators had a strong correlation with its respective construct, thereby indicating convergent validity. For instance, HA3, an indicator of the contribution of HR initiatives to the organizational mission, had the greatest loading of 0.884, showing the strong connection of HR initiatives to strategic organizational goals. Similarly, IS2, measuring resource sufficiency to deploy HRIS, stood at 0.855, indicating the importance of resource distribution to enable information system success. On the other hand, such measures as HA2 (0.614) and IR1 (0.614) can be lower but still above 0.50, implying satisfactory though comparatively weaker contributions to their corresponding constructs. In addition to factor loadings, VIF values were computed to verify multicollinearity among the indicators. The findings revealed that all the values of VIF were less

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than the cut-off value of 5, thus confirming that there was no problem of multicollinearity in this dataset. This supports the strength of the measurement model because it shows that the indicators were not too highly correlated with each other, and that all explained independent variance in its construct.

Table 1

Factor Loadings and VIF

Indicator	Statement	Loading	VIF
Strategic HR Alignment (HR)			
HA1	HR practices consistently align with strategic goals	0.855	2.532
HA2	HR policies support long-term objectives	0.614	1.621
HA3	HR initiatives contribute to achieving mission	0.884	2.823
HA4	HR planning integrated with strategic planning	0.686	1.769
HA5	HR activities consistently support priorities	0.858	2.393
HA6	HR processes improve service delivery quality	0.796	1.994
Emerging Information Systems (IS)			
IS1	Confident using HRIS effectively	0.836	3.125
IS2	Adequate resources for HRIS	0.855	3.556
IS3	HRIS easily accessible	0.843	2.734
IS4	HRIS implementation costs affordable	0.736	1.758
IS5	Capable of learning HRIS effectively	0.795	2.458
IS6	Using HRIS not too complicated	0.819	2.389
IS7	HRIS improves HR service delivery	0.793	2.241
Institutional Readiness (IR)			
IR1	Prepared to adopt digital HR tech	0.614	1.419
IR2	Plans to implement new HR technologies	0.711	1.608
IR3	Ready to integrate HRIS into daily operations	0.712	1.555
IR4	Started evaluating HR technology options	0.820	1.956
IR5	Plan to expand HR digital capabilities	0.779	1.709
IR6	Staff open to adopting new HR technologies	0.706	1.589
Leadership Commitment (LC)			
LC1	Leaders actively support HRIS	0.842	2.415
LC2	Top management allocates resources for HR digital transformation	0.874	2.739
LC3	Leaders communicate importance of HR alignment	0.815	2.322
LC4	Senior management participates in HR planning	0.861	2.589
LC5	Leadership provides guidance for HR digital initiatives	0.827	2.478
LC6	Leaders monitor HRIS adoption progress	0.801	2.156
LC7	Top management champions HR transformation	0.869	2.662

4.1.1 Reliability and Convergent Validity

This sub-section attempted to assess the internal consistency and the convergent validity of the measures employed in the study. To this end, three statistical measures were applied: Cronbach's alpha, composite reliability (ρc), and Average Variance Extracted (AVE). The Cronbach's alpha values ranged from 0.820 for HR Alignment to 0.913 for Leadership Commitment, all of which are higher than the largely accepted threshold of 0.70. This means that the practices utilized under each construct always measure the same construct and, therefore, guarantee internal consistency. Similarly, composite reliability estimates also ranged from 0.869 to 0.931, further indicating high reliability for the constructs.

Furthermore, Average Variance Extracted (AVE) estimates ranged between 0.528 and 0.659, which is much greater than the minimum requirement of 0.50. This indicates that over half of the variance for each construct was accounted for by its respective indicators, validating convergent validity. Combined, these results indicate that the constructs employed in the study are reliable and valid, lending confidence in the truthfulness of the measurement model. This validity and reliability are critical for guaranteeing that follow-up hypothesis testing is based on strong and credible measurement instruments.

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Table 2
Reliability and Validity Statistics

Construct	Cronbach's Alpha	Composite Reliability (ρa)	Composite Reliability (ρc)	AVE
Emerging Information Systems (IS)	0.878	0.913	0.907	0.622
Leadership Commitment (LC)	0.913	0.917	0.931	0.659
Institutional Readiness (IR)	0.846	0.872	0.889	0.541
Strategic HR Alignment (HR)	0.820	0.839	0.869	0.528

4.1.2 Discriminant Validity

Discriminant validity was tested to ensure that each construct is capturing a distinct concept. Fornell–Larcker criterion was employed, whereby the square root of the AVE of each construct has to be greater than its correlations with the other constructs. The analysis confirmed that all constructs met this criterion. Further results are presented in the following sections. For example, the square root of AVE for HR Alignment was 0.727, which was greater than its correlations with IS (0.588), LC (0.521), and IR (0.496). This confirms that the constructs are distinct, minimizing multicollinearity and ensuring the structural model is a good fit to the hypothesized relationships.

Table 3
Discriminant Validity (Fornell–Larcker Criterion)

Construct	HR	LC	IR	IS
HR	0.727			
LC	0.521	0.812		
IR	0.496	0.543	0.736	
IS	0.588	0.512	0.468	0.788

4.1.3 Structural Model: Hypotheses Testing

The initial hypothesis (H1) examined the impact of Emerging Information Systems (IS) on strategic HR alignment. The PLS-SEM path analysis provided a significant positive impact ($\beta = 0.474$, $T = 8.076$, $p < 0.001$, $f^2 = 0.244$). The findings validate that the greater the adoption and effective deployment of Human Resource Information Systems (HRIS), the more aligned are the HR practices with the overall organizational strategy. In practice, this means that information systems are a key enabler of HR alignment in the sense that they enable data-driven decision-making, reduce HR complexities, and enhance strategic contributions. The implications accord with the Resource-Based View (RBV), which places technological resources as strategic assets that can produce sustained competitive advantage when leveraged in the right way.

The second hypothesis (H2) tested the effect of leadership commitment to aligning HR strategically. Findings indicated an extremely high positive effect ($\beta = 0.230$, $T = 4.116$, $p < 0.001$, $f^2 = 0.057$). Although the smaller size of the effect, as compared to information systems, the effect of leadership remained central. Such leaders, by their demonstration of dedication in providing direction that is unambiguous, directing resources, and advocating for digital transformation projects, enable an environment for HR alignment. This means that technology is the prime mover, but leadership is also a catalyst for sustaining the process of implementation and maintaining efforts strategically aligned.

The third hypothesis (H3) tested the role of institutional preparedness in affecting HR alignment. Results established the presence of a positive and significant relationship ($\beta = 0.284$, $T = 4.656$, $p < 0.001$, $f^2 = 0.198$), pointing towards organizational preparedness as a deciding factor in paving the way for alignment. Institutional preparedness, which takes the form of sufficient technical capacity, facilitative infrastructure, and skilled workforce, increases the ability of HR departments to translate IS adoption into actual strategic deliverables. This indicates that preparedness is not just an enabler but also a major driver that causes IS implementation to lead to successful HR alignment. Together, these findings indicate that successful HR alignment is driven by a combination of technological, leadership, and institutional drivers.

Table 4
SEM Path Coefficients (Direct Effects)

Hypothesis	Path	β	Sample Mean	Std. Deviation	T Statistics	P Values
H1	IS → HR	0.474	0.474	0.059	8.076	0.000
H2	LC → HR	0.230	0.232	0.056	4.116	0.000
H3	IR → HR	0.284	0.285	0.061	4.656	0.000

4.1.4 Model Explanatory Power and Predictive Relevance

The explanatory power of the model was assessed using R^2 and Stone-Geisser Q^2. Strategic HR Alignment had an R^2 of 0.407, indicating that IS, LC, and IR collectively explain 40.7% of the variance in HR alignment. The

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predictive relevance Q^2 was 0.234, demonstrating moderate predictive capability. This indicates that while these three constructs are significant, additional factors such as organizational culture, external policy frameworks, and workforce competencies may also influence HR alignment outcomes.

Table 5

Model Summary (R^2, Q^2, f^2)

Variable	R^2	Q^2	f^2
HR	0.407	0.234	
LC		0	0.057
IS		0	0.244
IR		0	0.198

4.2 Discussion

The findings of this study validate that new information systems bring a big positive effect to strategic HR alignment, reinforcing their role as a key facilitator of evidence-led decisions and effective HR processes. This result concurs with previous studies such as Adias (2025), which determined that converged HRIS platforms enhance organizational responsiveness and the implementation of HR strategy. Similarly, Elugbaju *et al*. (2024) argue that digital HR solutions drive alignment by way of real-time analytics to inform workforce planning and decision-making. In the Tanzanian public sector, this represents the transition from paper-based HR management to data-driven systems with transparency, accountability, and strategic relevance. Through the removal of administrative bottlenecks, new systems allow HR departments to focus on higher-order strategic activities that have a direct contribution to institutional and national development plans.

Leadership commitment was also found to have a strong and positive correlation with HR alignment. Amoah *et al*. (2022), attest to this by pointing out that leadership is the prime catalyst for organizational readiness for digital transformation. Leaders not only spend resources but are champions of change as well, creating an innovative climate and eradicating bureaucratic impediments that often hinder strategic alignment. In Tanzanian ministries and agencies, organizational culture is established by leadership, secures staff buy-in, and ensures long-term investment in digital HR initiatives. By vision, accountability, and leadership, HR alignment is a long-term organizational priority, rather than an ad-hoc reform agenda.

Readiness at an institutional level was also a determinant of HR alignment, showing readiness in digital transformation activities. This is in accord with Vong *et al*. (2025) who present that readiness, as measured by infrastructure, human capital, and procedural arrangements, is a condition precedent for HR technologies to be profitable. In the setting of this research, readiness is a proxy for the ability of public institutions to absorb new technologies without service disruption. Ministries that undertake digital literacy, training, and change management initiatives realize smoother HR–technology interface, avoiding system underutilization or resistance. Furthermore, effective preparation ensures supporting policy, workflow, and technical support structures are available to ensure the alignment process is sustained.

Regardless of these positive implications, literature and studies also indicate noteworthy contextual constraints. Deger (2025) and Sithole *et al*. (2024) warn that IS adoption would not be sufficient to achieve alignment if resistance exists in the organization or there is a mismatch between system capability and strategic requirements. In the same way, Wallace (2022) note that commitment from leadership is not necessarily going to yield tangible outcomes in public institutions due to entrenched bureaucratic norms as well as immovable governance systems. The findings suggest that environmental factors such as institutional culture, governance systems, and environmental policy pressures can act to mediate the extent to which IS, leadership, and readiness make their way into meaningful HR alignment outcomes.

The explanatory power of the model, reflected by R^2 measure 0.407, is moderate, which reveals that IS, leadership commitment, and institutional readiness as a bundle of factors explain 40.7% of variance in HR alignment. While strong, the finding also suggests that other variables such as HR analytics capacity, change management practices, political variables, or organisational learning capacity can explain alignment outcomes more. This aligns with Hair *et al*.'s (2021) recommendations that moderate explanatory power supports the significance of investigating mediating and moderating variables in more depth. Such future research would therefore be capable of extending the model to encompass the dynamic dynamics among external institutional pressures, organizational culture, and technological adoption.

In general, the study highlights that new digital systems, leadership acceptance, and organizational preparedness all together form the foundation for achieving strategic HR alignment in Tanzanian government organizations. New digital systems provide the technical foundation, leadership offers vision and guidance, and organizational preparedness provides absorptive capability and sustainability. However, effectiveness is relative and not absolute and is situational dependent on bureaucratic culture, governance structures, and political will. Henceforth,

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Tanzanian ministries and agencies must properly utilize technology in the service of strategic HR alignment through a more comprehensive approach that harmonizes technology, leadership, and preparedness as part of overall organizational reform.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study provides empirical evidence that emerging Information Systems, Leadership Commitment, and Institutional Readiness are all critical drivers of Strategic HR Alignment in Tanzanian MDAs. Information Systems adoption strengthens HR integration into organizational planning and supports data-driven decision-making. Leadership commitment fosters an enabling environment for transformation, and Institutional Readiness ensures that the necessary capacity and infrastructure are in place to capitalize on technological investments. The results emphasize that there is a need for balanced strategy: technology adoption needs to be balanced with leadership support and general organization readiness. Policymakers and managers should accord high priority to building capacities, leadership training, and infrastructural development for optimizing HRIS strategic contribution.

This paper therefore has several implications. Methodologically, the use of SEM in this study presents its application in evaluating complex interrelations among technological, leadership, and institutional variables in public sector HR alignment. Adherence to strict construct validity and reliability measurement provides a sound methodological framework for future studies in developing-country contexts. On practical grounds for practitioners, findings point to the fact that investments in HRIS must be supported by efforts to improve leadership commitment and institutional Readiness. Awareness programs, leadership capacity development, and infrastructure construction can make the strategic worth of HR technology more effective. Lastly, on theoretical contributions wherein this study adds to theoretical knowledge by bridging the Resource-Based View (RBV) and Contingency Theory, demonstrating that new information systems as strategic assets will only create value if they are supported with leadership sponsorship and institutional Readiness. By illustrating that alignment is a product of the interaction between internal resources and context conditions, the findings validate that neither technology nor leadership alone can guarantee strategic HR alignment. Instead, long-term alignment requires an active interaction where resources get mobilized in the right manner in the right kind of organizational context, contributing to theoretical deliberations on how digital transformation reengineers HR strategy in the public sector.

5.2 Recommendations

The current study offers empirical evidence that emerging Information Systems, Leadership Commitment, and Institutional Readiness are all predictors of Strategic HR Alignment of Tanzanian MDAs. Information Systems adoption anchors HR integration into organizational strategies and supports data-informed decision-making. Leadership commitment fosters a good climate for change, while Institutional Readiness ensures the readiness of capacity and infrastructure to reap technological investments. The results emphasize the need to adopt a synergistic strategy: technological implementation should be followed by aggressive leadership backing and good organizational preparedness. Managers and policymakers need to give topmost priority in creating capacity, training leaders, and infrastructure so that HRIS could make a stronger strategic impact. Thus, this paper has a number of implications.

Methodologically, the employment of SEM in the research demonstrates its application in evaluating complex interrelating of technological, leadership, and institutional variables in public sector HR alignment. The stringent test of construct validity and reliability provides a robust methodological model for future research in developing-country contexts. On practical grounds for practitioners, the findings suggest that investments in HRIS must be matched by initiatives to strengthen leadership commitment and institutional Readiness. Awareness programs, leadership training, and investments in infrastructure can maximize the strategic contribution of HR technology. Lastly, on theoretical contributions whereby this study adds to theoretical understanding by resolving the conflict between the Resource-Based View (RBV) and Contingency Theory, demonstrating that new information systems as strategic assets appreciate only when supported by leadership and institutional Readiness. In showing how alignment comes out of the interaction between resources within the organization and conditions within the context, the outcomes reinforce the contention that technology or leadership alone is not sufficient to guarantee strategic HR alignment. Instead, alignment must come out of a dynamic interaction where resources are mobilized efficiently in the appropriate organizational context, advancing the theoretical debate on how digital transformation reshapes HR strategy in the public sector.

REFERENCES

Adias, L. T. (2025). Digital human resource management transformation in Nigeria: Impacts on talent, performance, and workforce well-being. *SJTIA, 1*(1), 1–19. https://doi.org/10.69798/76859601

Licensed Under Creative Commons Attribution (CC BY-NC)

Agwoje, S. E., & Okeleke, M. C. (2023). Institutional leadership and the management of change in the 21st century university education. *International Journal of Institutional Leadership, Policy and Management, 5*(4), 393–417. https://doi.org/10.71514/jssal/2025.198

Ahmed, R. R. (2024). A comparative analysis of multivariate approaches for data analysis in management sciences. https://www.researchgate.net/publication/37767186

Amoah, C., Van Schalkwyk, T., & Kajimo-Shakantu, K. (2022). Quality management of RDP housing construction: Myth or reality? *Journal of Engineering, Design and Technology, 20*(5), 1101–1121. https://www.researchgate.net/publication/35252147

Amoako, I. O., Akwei, C., & Damoah, I. (2021). "We know their house, family, and workplace": Trust in entrepreneurs' trade credit relationships in weak institutions. *Journal of Small Business Management, 59*(6), 1097–1126. https://www.researchgate.net/publication/37486915

Arora, M., Ahmad, V., Arora, T., & Kumar, R. (2024). Digital transformation and talent management. In *Green metaverse for greener economies*. CRC Press.

Assensoh-Kodua, A. (2019). The resource-based view: A tool of key competency for competitive advantage. *Problems and Perspectives in Management, 17*(3), 143. https://www.researchgate.net/publication/33508099

Awashreh, R. (2025). Leadership in the tourism sector: Strategies for sustainable growth and innovation. In *Human capital management and competitive advantage in tourism* (pp. 107–136). IGI Global Scientific Publishing.

Bahari, N. A. B. (2025). Understanding the evolution of HR systems: From digitisation to digital transformation in human resource management. *Industrial Relations, Faculty of Social Sciences and Humanities*, 12pp. https://papers.ssrn.com/sol3/papers

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bozkus, K. (2023). Organizational culture change and technology: Navigating the digital transformation. In *Organizational culture-cultural change and technology: IntechOpen*. https://doi.org/10.5772/intechopen.112903

Chathuranga, K. (2024). Critical success factors of human resource information system implementation in the local commercial banks in Sri Lanka [Master's thesis, Åbo Akademi University]. https://www.doria.fi/chathuranga_kasun

Cheung, C.-T., Lau, J. L., & Wang. (2024). Reporting reliability, convergent and discriminant validity with structural equation modeling: A review and best-practice recommendations. *Asia Pacific Journal of Management, 41*(2), 745–783. https://doi.org/10.1007/s10490-023-09871-y

Chewe, J. R., Shidende, N., & Matogoro, J. (2025). Analysis of components for BPR implementation in the public sector, focusing on online service delivery in Tanzania. *International Journal of Innovative Science and Research Technology*, *10*(2), 986–1001. https://doi.org/10.5281/zenodo.14937074

Chourasia, A., & Bahuguna, P. (2024). Organizational performance as dependent variable in strategic human resource management literature: A journey so far. *Benchmarking: An International Journal*, 1–34. https://www.emerald.com/insight/1463-5771.htm

Deger, L. (2025). Resistance to new technologies on the firm and interfirm level [Institute of Strategic Management, Johannes Kepler Universitat Linz]. https://epub.jku.at/obvulihs/download/pdf

Djatmiko, G. H., Sinaga, O., & Pawirosumarto, S. (2025). Digital transformation and social inclusion in public services: A qualitative analysis of e-government adoption for marginalized communities in sustainable governance. *Sustainability, 17*(7), 2908. https://doi.org/10.3390/su17072908

Dominic, B. S., & Rutenge, M. M. (2024). Exploring employees' perception of the effectiveness of public employees' performance management information system: A case of the judiciary of Tanzania. *African Journal of Empirical Research, 5*(4), 1188–1196. https://doi.org/10.51867/ajernet.5.4.97

Elugbaju, W. K., Okeke, N. I., & Alabi, O. A. (2024). Human resource analytics as a strategic tool for workforce planning and succession management. *International Journal of Engineering Research and Development, 20*(11), 744–756.

Febrianti, A. M., & Jufri, N. S. N. (2022). Examining the predictors of firm performance: The role of transformational leadership, HRM digitalization, and organizational commitment. *International Journal of Research in Business & Social Science, 11*(4), 131–139. https://doi.org/10.20525/ijrbs.v11i4.1788

Fiedler, F. E. (1967). *A theory of leadership effectiveness*. McGraw-Hill.

Gandi, E. A., & Saurombe, M. D. (2025). Talent management practices for minimising talent turnover in a public sector organisation. *South African Journal of Economic and Management Sciences, 28*(1), 6135. https://doi.org/10.4102/sajems.v28i1.6135

Gange, V., & Barongo, F. (2024). The effects of training on employee performance: A case of Tanzania Police Headquarters. *African Journal of Empirical Research, 5*(4), 216–225. https://doi.org/10.51867/ajernet.5.4.18

Licensed Under Creative Commons Attribution (CC BY-NC)

García-Cruz, J., Rincon-Roldan, F., & Pasamar, S. (2024). When the stars align: The effect of institutional pressures on sustainable human resource management through organizational engagement. *European Management Journal, 43*(4), 594–604. https://doi.org/10.1016/j.emj.2024.03.009

Hair Jr., J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). Evaluation of reflective measurement models. In *Partial least squares structural equation modeling (PLS-SEM) using R. Classroom companion: Business* (pp. 75–90). Springer. https://doi.org/10.1007/978-3-030-80519-7_4

Hentati, H., Jardak, M. K., & Boulila, N. (2025). The impact of contingency factors on the degree of digitization and the operational performance in accounting firms. *Journal of Accounting & Organizational Change, 14*(1), 295–306.

Hossain, Q., Ikbal, M. Z., & Rahman, M. M. (2025). A meta data-driven decision support in human capital management: Reviewing HRIS and predictive analytics integration. *ASRC Procedia: Global Perspectives in Science and Scholarship, 1*(1), 215–246. https://doi.org/10.63125/xgew7q22

Issah, O., David, A., & Eric, D. B. (2024). Analyzing the influence of organizational culture and top management orientation on the relationship between e-procurement and firms' performance: A contingency factors perspective. *Project Management and Scientific Journal, 7*(9), 93–116. https://doi.org/10.4314/pmsj.v7i9.6

Kibira, Y. Y. (2024). E-government services integration in Tanzania: A framework [Master's thesis, University of Dodoma]. https://repository.udom.ac.tz/items

Latupeirissa, J. J. P., Dewi, N. L. Y., Prayana, I. K. R., Srikandi, M. B., Ramadiansyah, S. A., & Pramana, I. B. G. A. Y. (2024). Transforming public service delivery: A comprehensive review of digitization initiatives. *Sustainability, 16*(7), 2818. https://doi.org/10.3390/su16072818

López-Cabarcos, M. Á., Vázquez-Rodríguez, P., & Quiñoá-Piñeiro, L. M. (2022). An approach to employees' job performance through work environmental variables and leadership behaviours. *Journal of Business Research, 140*, 361–369. https://doi.org/10.1016/j.jbusres.2021.11.006

Martins, H., & Moreira, S. B. (2025). Human capital at the crossroads of sustainability: Integrating key trends in HRM with the sustainable development goals. In *Integrated science to achieve sustainable development goals* (pp. 99–120). Springer Nature. https://doi.org/10.1007/978-3-031-88777-2_7

Matimbwa, H., & Olatokun, W. (2024). Human capital management information system: Scope of application and challenges facing the public sector in Tanzania. *Regional Journal of Information and Knowledge Management, 9*(1), 29–46. https://doi.org/10.70759/z51tef79

Mdhlalose, D. (2025). The analysis of the criticality of data integrity in human resources information systems. *Advanced Research in Economics and Business Strategy Journal, 6*(1), 237–252. https://doi.org/10.2139/ssrn.5331772

Müller, S. D., Konzag, H., Nielsen, J. A., & Sandholt, H. B. (2024). Digital transformation leadership competencies: A contingency approach. *International Journal of Information Management, 75*, 102734. https://doi.org/10.1016/j.ijinfomgt.2023.102734

Musungwini, S., Tewera, D., & Musungwini, L. (2025). Harnessing ICTs to revolutionise recruitment and retention and navigating an era of transformation and a volatile labour force in a developing context. In *Innovative recruitment and retention for employee empowerment* (pp. 119–152). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3693-6602-8.ch005

Mwakwabe, M. (2023). Assessment of adoption and utilization of ICT systems in the public sector in Tanzania: A case of Immigration Department, Ministry of Home Affairs, Dar Es Salaam, Tanzania [Master's thesis, Institute of Accountancy Arusha]. http://dspace.iaa.ac.tz:8080/xmlui/handle/123456789/2693

Mwogosi, A. (2023). Digital transformation in Tanzania's healthcare sector: A systematic review of robust electronic health records systems' critical success factors [Master's thesis, The University of Dodoma]. https://orcid.org/0000-0002-0159-6163

Obeta, R. U., & Edwin, E. I. (2025). Exploring the role of digital governance in enhancing transparency and accountability in human resource management practices in Nigerian organizations. *Arabian Journal of Business and Management Review (Kuwait Chapter), 14*(1), 13–18.

Ogbe, O., & Uchechukwu, J. (2024). Cloud-based HRIS solutions: Transforming human resource management in a hybrid workforce era. *International Journal of Research Publication and Reviews, 5*(11), 5500–5515. https://doi.org/10.55248/gengpi.5.1124.3342

Okon, R., Odionu, C. S., & Bristol-Alagbariya, B. (2024). Integrating data-driven analytics into human resource management to improve decision-making and organizational effectiveness. *IRE Journals, 8*(6), 574.

Omowole, B. M., Olufemi-Philips, A., Ofadile, O., Eyo-Udo, N. L., & Ewim, S. E. (2024). Barriers and drivers of digital transformation in SMEs: A conceptual analysis. *International Journal of Frontline Research in Multidisciplinary Studies, 5*(2), 19–36. https://doi.org/10.56781/ijsrst.2024.5.2.0037

Licensed Under Creative Commons Attribution (CC BY-NC)

Otoo, F. N. K., Kaur, M., & Otoo, E. A. (2022). Does human capital mediate the nexus of human resource management (HRM) practices and organizational performance? *International Journal of Research in Business & Social Science, 11*(5), 199–209. https://doi.org/10.20525/ijrbs.v11i5.1829

Purwanto, A., Purba, J. T., Bernarto, I., & Sijabat, R. (2023). Investigating the role of digital transformation and human resource management on the performance of the universities. *International Journal of Data and Network Science, 7*, 2013–2028. https://doi.org/10.5267/j.ijdns.2023.6.011

Rönkkö, M., & Cho, E. (2022). An updated guideline for assessing discriminant validity. *Organizational Research Methods, 25*(1), 6–14. https://doi.org/10.1177/1094428120968

Savitri, T. A., Buchori, I., & Supratikta, H. (2024). Exploring the role of human resources information systems in employee performance management: A systematic literature review. *Indonesian Development of Economics and Administration Journal, 3*(1), 55–64. https://doi.org/10.70001/idea.v3i1.211

Sharmin, S., & Chowdhury, R. H. (2025). Digital transformation in governance: The impact of e-governance on public administration and transparency. *Journal of Computer Science and Technology Studies, 7*(1), 362–379. https://doi.org/10.32996/jcsts.2025.7.1.27

Siddique, M. S., Mohd Zin, M. L. B., & Ismail, S. A. B. (2025). Advancing sustainable digital transformations through HRIS effectiveness: Examining the role of information quality, executives' innovativeness, and staff IT capabilities via IS ambidexterity. *Sustainability, 17*(13), 5784. https://doi.org/10.3390/su17135784

Sithole, S., Grahn, T., Pillay, D., & Thango, B. (2024). Aligning IT and business strategies: Achievements and challenges–A systematic literature review. *Preprints.org*, 66pp. https://doi.org/10.20944/preprints202410.2056.v1

Sofi, F., Al-Fattal, A., & Fan, I. S. (2025). Understanding HRIS adoption: A psychosocial perspective on managerial engagement and system effectiveness. *Psychology International, 7*(3), 57. https://doi.org/10.3390/psycholint7030057

Tandika. (2024). Resource-based theory: Institutional factor for effective strategic human resource management in public organizations. *Journal of Public Sector Management, 8*(5), 11–31.

Tasleem, R., Gulati, D., & Sharma, S. (2023). Organizational readiness for change: A multi-dimensional framework. *Iconic Research and Engineering Journals (IREJ), 6*(1), 1095–1108.

Terfa, M., Hamla, A., & Altaqqi, O. (2025). Future visions and directions of human resource management from the perspective of classical and modern approaches (An analytical study of human resource management in light of the resource-based approach, the knowledge-based approach, and the technological approach). *Journal of Creativity, 15*(1), 19–39.

Thomas, A. (2024). Digitally transforming the organization through knowledge management: A socio-technical system (STS) perspective. *European Journal of Innovation Management, 27*(9), 437–460. https://doi.org/10.1108/EJIM-02-2024-0114

Tjorko, R. A., & Tan, C. (2025). Comparative perspectives to inform digital leadership qualities for SMEs in developing countries. In *UK Academy for Information Systems (UKAIS2025)*, Newcastle University Business School, United Kingdom. https://discovery.ucl.ac.uk/paper_79_Final

Udoh, H. (2024). E-governance performance in the context of developing countries [Doctoral thesis, University of Leicester]. https://figshare.le.ac.uk/articles/E-Governance_Perf

Vong, K. C., Udomvitid, K., Ueki, Y., Intalar, N., Pongsathornwiwat, A., Pannakkong, W., & Jeenanunta, C. (2025). Strategic human resource development for Industry 4.0 readiness: A sustainable transformation framework for emerging economies. *Sustainability, 17*(15), 6988. https://doi.org/10.3390/su17156988

Wallace, J. B. (2022). Establishing a first island chain balance of power: Cooperative development of the quadrilateral security dialogue [Doctoral thesis, US Army Command and General Staff College]. https://apps.dtic.mil/sti/trecms/pdf

Wang, A. (2024). Enhancing HR management through HRIS and data analytics. *Applied and Computational Engineering, 64*(1), 223–229. https://doi.org/10.54254/2755-2721/64/20241394

Willie, M. (2025). Leveraging digital resources: A resource-based view perspective. *Golden Ratio of Human Resource Management, 5*(1), 1–14. https://doi.org/10.52970/grhrm.v5i1.415

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Work environment as a driver to university academic staff levels of job satisfaction in a selected public and private universities in Kenya

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ABSTRACT

The issue of academic staff levels of job satisfaction has become a major issue of concern globally based on the fact that the academic staff play a significant role in the day-to-day affairs of the university. Both external and internally generated drivers determine the levels of job satisfaction. However, several studies have pointed out remuneration as the most critical driver to the academic staff's levels of job satisfaction falling short of examining the same issue with related issues in the light of a comparative analysis between private and public universities. This study, therefore, is determined to bring out a clear cross-cutting discussion in public and private universities and recommend possible policy action to improve on the academic staff levels of job satisfaction and consequently output. Guided by the pragmatism research paradigm and the Herzberg two-factor theory, the study employed a concurrent mixed research method design. The target population for this study was the members of the academic staff in a selected private and public university. Participants were purposively identified and selected; therefore, the sample size for public university was 115 participants, while that of private university was 60. Data was collected, evaluated, and analyzed both qualitatively and quantitatively, giving an in-depth examination into the subject matter. The study found out that there is a strong relationship between work environment and the academic staff levels of job satisfaction; further, it discovered that there is a strong difference in the levels of job satisfaction between the academic staff in public and private universities in relation to the levels of academic staff job satisfaction. The study therefore proposes policy reforms in both public and private universities to ensure a favorable working environment is created for the members of the academic staff in order to increase staff output. For ethical consideration, the selected public university is referred to as University Alpha, while the private university is University Beta.

Keywords: Alpha, Beta, Driver, Job, Remuneration, Satisfaction, Staff

I. INTRODUCTION

This paper presents an analysis of how work environment is a key driver to the level of university academic staff levels of job satisfaction. In understanding the dynamics involved the study examined the case of University *Alpha* a representative of a public university and *University Beta* a representative of a private university in Kenya. The independent variable in the context of this study is work environment that includes the office space assigned to the members of the academic staff, interpersonal relationships at place of work, institutional support, staff work load and communication structures. Dependent variable on the other hand is the academic staff level of job satisfaction that includes the levels of contentment, motivation, and feelings of fulfillment at place of work. This study points out that work environment shapes the conditions under which academic staff perform their duties such as teaching, research and community outreach. These environmental factors are seen as physical, psychosocial or organizational. In line with other similar discussion by Wachira et al. (2017) and Tetty (2006), this study finds out that pphysical environmental factors includes facilities at work place such as office space, internet connectivity and availability of teaching resources. Organizational environmental factors include policy issues and workload while psychosocial environmental factors include teamwork and collegiality.

This study therefore concludes that there is a significant relationship between work environment and academic staff job satisfaction in selected public and private universities where a supportive physical environment significantly influences the level of job satisfaction among academic staff. Further, Positive collegiality among members of the academic staff enhances academic staff levels of job satisfaction and fair workload distribution and supportive work environment significantly promote academic staff levels of job satisfaction. The study also notes that availability of professional development opportunities significantly influences academic staff levels of job satisfaction.

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Beyond physical facilities, the study explored the psychological and social environment, where significant differences also emerged. Quantitatively, 68% of private university (University Beta) staff agreed or strongly agreed that their institutions fostered a collegial and respectful professional culture, compared to just 43% in public universities (University Alpha). Interviews and focus group discussions revealed that staff in private institutions felt more recognized, supported by leadership, and included in decision-making processes; thereby nurturing a sense of belonging and psychological safety. Conversely, academic staff in public universities frequently cited bureaucratic rigidity, lack of feedback mechanisms, and minimal recognition for achievements, which contributed to a pervasive sense of neglect and disengagement. This line of thought seems to be in agreement with Ulfah et al., (2023). The dimension of academic freedom and professional autonomy presented a clearer picture. Quantitative analysis showed that while 59% of staff in public universities (University Alpha) felt they enjoyed high levels of autonomy in their teaching and research activities, only 48% in private universities (University Beta) shared this view. Qualitative data provided depth to this finding: while public university (University Alpha) staff valued the freedom to innovate, they expressed frustration that this freedom was hollowed out by lack of funding, erratic scheduling, and overregulation in procurement and ethics review processes. On the other hand, private university (University Beta) staff appreciated the structured expectations and institutional clarity, although some felt constrained by performance based evaluations, strict institutional structures and managerial oversight. This argument is also brought out in the work of Wachira et al, (2017), who argues that leadership style determine a lot about management of an institution and therefore affecting workers levels of motivation.

Workload and time pressure emerged as significant determinants of academic staff job satisfaction, with strong quantitative disparities: 64% of academic staff in public universities (University Alpha) described their workload as “excessive” or “unmanageable,” compared to 41% in private universities (University Beta). Public university (University Alpha) staff frequently reported teaching very large classes, undertaking multiple administrative responsibilities, and managing external consultancy work and pert time lecturing to compensate for low salaries. In contrast, while private university (University Beta) staff also worked under tight schedules, many reported that workload allocation was more predictable and better managed. A study conducted by Ngethe et al. (2012) points out to similar factors having a significant influence on the employee levels of job satisfaction. Another critical finding related to the availability of institutional support services such as research funding, professional development, and mentorship. Survey results showed that only 35% of public university (University Alpha) respondents felt their institutions provided adequate support for research and career advancement, in contrast to 62% in private universities (University Beta). Qualitative evidence reinforced this gap: while public university (University Alpha) staff expressed frustration with the bureaucratic hurdles to access funding or attend conferences, private university (University Beta) staff spoke of regular training opportunities, internal research grants, and clear staff development policies (Ngethe et al, 2012; Odhiambo, 2014).

Lastly, the issue of safety and campus security was more prominent among public university (University Alpha) respondents, 29% of whom described their working environment as “unsafe” or “poorly secured,” compared to only 11% in private universities (University Beta). Focus group discussions highlighted concerns over theft, harassment, and lack of security personnel, particularly for those teaching evening classes in public universities (University Alpha). This could be a similar case with a study done by Wachira et al. (2017) and Tetty (2006) which point out that environmental factors are significant in determining employees levels of job satisfaction. By contrast, staff in private universities (University Beta) reported feeling secure, with several mentioning the presence of well-trained guards, surveillance cameras, and clear emergency protocols.

1.1 Statement of the Problem

Notwithstanding despite a lot of attention on the role of the academic staff in the university setting and generally to the university education scholarly work into institutional drivers such as work environment remains limited with few studies narrowly examining the issue of completely missing the point. Scholarly works by Wachira et al. (2017), Tetty (2006) have either looked at one aspect of environmental drivers of focused on one category of an institution a gap that this study intends to fill by examining the situation in both public and private universities. Therefore this study points out of interest that in Kenyan public and private universities, the relationship between work environment drivers such as policy formulation and implementation, compensation regimes, career progression, professional development frameworks, and interpersonal relations, and staff job satisfaction levels has not been adequately examined in the context or institutional category. The limited research that exists tends to generalize findings across universities, ignoring the unique governance structure, funding, and operational models that differentiate them. This analytical gap has left MOEST, CUE, policymakers, UMB, UASU, and university councils without wide, evidence-based frameworks for responding to staff welfare concerns in an objective manner, justifying the urgency of this study and why it was conducted.

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1.2 Research Objectives

The study was guided by the following one key objective namely to examine the role of working environment on academic staff job satisfaction in selected public and private universities.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Herzberg Two Factor Theory

Herzberg's Two-Factor Theory developed in 1959, was discovered to be suitable and adequate which is also referred to as the Motivation-Hygiene Theory. This theory is found to distinguishes between two sets of drivers that influence university academic staff levels of job satisfaction in both university Alpha and university Beta: that is the *motivators* which is considered as intrinsic motivational driver and *hygiene factors* which is considered as extrinsic drivers. According to Herzberg, motivator drivers consists of elements such as staff recognition, staff achievement, and staff responsibility which are considered to influence academic staff job satisfaction and drive or increase staff output, while on the other hand hygienic drivers consists elements such as university policies, university administrative practices, academic staff salary, and university working conditions which do not in themselves motivate members of the academic staff, but their absence or inadequacy definitely leads to high levels of job dissatisfaction among the members of the university academic staff in both university Alpha and university Beta for this study (Herzberg et al., 1959).

Based on this study, university institutional policy in both university Alpha and Beta can be classified under hygiene factors or drivers as argued in this theory. When a university whether Beta or Alpha has poorly designed or inconsistently applied policies characterised with unclear academic staff promotion procedures and criteria, bureaucratic performance evaluation tools and procedures, or inequitable staff recognition, rewards and compensation standards may ultimately lead to university academic staff frustration, disengagement, demotivation, low output, disengagement and transfer to better or well-structured universities. On the other hand, when university policies are clearly and well-articulated, procedurally implemented, and transparently executed, they decrease's the levels of the academic staff dissatisfaction and create a well supportive academic staff work environment within which intrinsic drivers can survive leading to greater academic staff job satisfaction in both university Alpha and university Beta (Ng'ethe et al., 2012; Odhiambo, 2014). Therefore, although university policy may not always directly "motivate" and "influence" academic staff job satisfaction, it is should be understood that it is important in creating a working environment where motivation is natured and thrives and is sustainable for the benefit of the university and the members of the university academic staff.

2.2 Empirical Review

Empirical review of this study is based on the objective namely to examine the role of working environment on academic staff job satisfaction in selected public and private universities. Therefore, the study notes that quality of the academic staff work environment determines to a greater percentage the levels of the employee job satisfaction. A good working environment comprising of adequate and well-furnished office space, well-equipped lecture hall, well-furnished laboratory and internet connectivity is relatively important in influencing the academic staff level of job satisfaction. Studies done by Chimanikire et al. (2007) and Ngethe et al. (2012) pointed out that poor working conditions such as old and dilapidated lecture halls, lack of internet connectivity, high number of lecturer student ratio have greatly affected the ability of the members of the university academic staff to perform their duties effectively. This study reveals that the above findings is not far from the truth since the study found out that university Alpha was characterised with overcrowded lecture halls and dilapidated infrastructure yet it receives minimal funding from the government which has greatly lowered the academic staff levels of job satisfaction and the general staff output at work. On the other hand, several studies including the ones done by Wachira et al. (2017) and Tetty (2006) have pointed out that private universities have relatively better working environment than those of public universities. According to them, private universities have invested many resources on putting up state of the art infrastructure raising the levels of the academic staff job satisfaction. However, this argument remains largely unsubstantiated by a wide range of studies that are conflicting. Most existing literature on the subject matter is limited to quantifying the direct correlation between specific infrastructural elements, such as the condition of office spaces, laboratory functionality, or ICT access, and levels of university academic staff job satisfaction. There is therefore an urgent need of this scholarly work that goes beyond generalizations by employing a mixed research method design to effectively measure and evaluate on the impact of university work environment on the levels of the academic staff job satisfaction across institutional types

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III. METHODOLOGY

3.1 Study Design

This study employed a mixed-method research design, specifically concurrent mixed method design [QUANT + qual] (Kroll et al., 2005). Generally, a research design was used to determine what, when, how much, where, or by what means a study is conducted. The research design was suitable since qualitative data provided more insights and in-depth information from the information collected. Participants lived experiences played a significant role in drawing conclusions in this study.

3.2 Study Setting

This study was based in Uasin Gishu and Machakos Counties of Kenya. The two counties represent diverse geographical and demographic characteristics needed for this study. Uasin Gishu County, is known for its vast agricultural activities and many educational institutions which includes, several universities namely; Mount Kenya University Eldoret Campus, Moi University, Catholic University of East Africa Gaba Campus, University of East Africa Baraton Eldoret extension Center, and the University of Eldoret, equally Machakos County is inhabited by diverse ethnic communities and has several educational institutions including Machakos University, South Eastern Kenya University Tala Campus, Scott Christian University and Daystar University. Consequently, the variance in these areas provided valuable insights into how different work environmental factors influence the academic staff job satisfaction in the university.

3.3 Target Population

Target population for this study was 887 as tabulated in table 1

Table 1

Target and Actual Study Population

University Category	Target Population	Accessible Population
University Alpha (Public University)	740	134
University Beta (Private University)	141	66
Total	**887**	**200**

3.4 Sampling Procedure and Sampling Size

Simple Random Sampling was employed in this study. This method was designed to ensure that every participant within the target population had an equal chance of being selected, which helped in eliminating bias and ensuring that the sample was a clear representative of the population. In this case the the population included all academic staff across the selected public and private universities in Kenya. Therefore, the sample size for the university Alpha was 115 participants, while the sample size for university Beta was 60 participants.

3.5 Data Collection Instruments

The study used questionnaires and well developed interview schedules as the main data collection instrument for academic staff and university managers. The two data collection instruments corroborated each other to ensure an in depth data collection on the subject.

3.6 Data Analysis

Data was analyzed qualitatively and quantitatively. This was done concurrently and then merged with the final report. Quantitative data was analyzed using Statistical Package for Social Science (SPSS) software. Both descriptive and inferential statistics were used in quantitative data analysis. For descriptive statistics, percentages and frequencies were used; for inferential statistics, simple linear regression was used.

IV. FINDINGS & DISCUSSION

4.1 Qualitative Analysis of work environment on academic staff Job Satisfaction Levels

This study conducted a qualitative study to verify the findings of quantitative analysis in order to determine the true position of environmental drivers to university academic staff levels of job satisfaction. Oral interviews were conducted on participants in university Alpha and Beta; these interviews were guided by well-structured interview schedules. Data obtained through key informant interviews (KIIs) were analyzed using thematic data analysis procedures. The outcome of the oral interviews revealed a lot as compared with quantitative outcome in this study above. Qualitative findings through participant's voices are discussed below.

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4.1.1 Institutional Infrastructure and Resource Availability

Infrastructure came out to be a major sub driver within the environmental driver as a force of academic staff job satisfaction. It was clear from all the respondents from university Alpha that this factor greatly undermined job satisfaction. Academic staff in university Alpha described poor working environment characterized with low government capitation, old lecture halls, unstable internet, luck of certain laboratory equipment's and luck of office space for members of the academic staff. These were pointed out as key reasons for high levels of dissatisfaction among the members of the academic staff in Alpha University.

Academic staff in university Alpha noted the following:-

> "*Very few members have offices and in most cased they are very old professors who came to the university earlier and the heads of academic departments, majority of us share offices limiting our levels of privacy. Sometimes it's difficult to even suit in the office to write academic papers and even mark examination scripts, it's just difficult for us to fully function*". KII-2-M-A

While the second participant noted that,

> "*It's difficult to supervise post graduate students because I can't even access the latest journals and books in my area of specialization unless I go out of hand and purchase using my own money. It's really frustrating something needs to be done*". KII-4-M-A

Another KII noted

> "*The lecture halls are dilapidated, I can't even use my laptop and projector, and there are no power sockets".* KII-2-M-A

Similarly

> "*Sometime I go to the lecture hall early enough but students have no chairs to sit on. Students can take even an hour to look for chairs and nobody is concerned. This practice has been on for years now. Students numbers is increasing but the state of facilities in the university has remained the same for over ten years I have worked in this university*". KII-3-M-A

This study notes that these environmental challenges play a significant role in demotivating members of the university academic staff. It's also an indicator that public universities have not prioritized work environment for its staff. Members of the academic staff feel they are not adequately supported in meeting their professional and institutional targets hence low levels of job satisfaction. On the other hand academic staff members of university Beta described there institution as having ultra-modern facilities fashioned with modernity. All the participants interviewed noted with a lot of confidence that they have modern lecture halls, they have enough offices allocated to them, the university has a lecturers parlor, they have high speed stable internet connectivity and there libraries are well furnished. This is noted by their voices bellow:-

"*I have a fully furnished personal office similarly to my colleagues. Our offices are connected with reliable internet. I am able to mark my scripts, set examinations and conduct online meetings and classes at the comfort of my office. I prefer working from my office than in any other place".* KII-1-F-B

From the above discussions this study notes that university alpha which is a representative of public universities does very little to support the members of the academic staff to perform the duties which they were employed to perform. This has led to the general feeling among members of the academic staff in public universities in Kenya to feel unsupported, neglected and helpless where as in university Beta which represents private universities there is more enabling environment and support to the members of the academic staff to perform their duties. However it to should be understood from the findings of this study that this institutional support through creation of the enabling environment is attached to a level of accountability from the part of the members of the academic staff . The strict accountability processes also act as a hindrance to the sense of freedom and job security among members of the academic staff hence lowering the levels of job satisfaction. The divergence in the outcomes of the working environments in university Alpha and Beta tends to justify a study by Ulfah et al. (2023) which demonstrated that high performance institutional systems require parallel investment in both staff support mechanism and performance monitoring. There must be equilibrium in order for the employee to realise full potential at the place of work thereby influencing high job satisfaction levels.

This study further reveals that the availability of better working environment in university Beta did not translate to perceived autonomy at place of work which is a key driver to individual job satisfaction. Several respondents demonstrated that while infrastructure was superb institutional environment was sometimes overly corporate and metric driven, with the management expecting a lot from the workers to achieve institutional goals. This specific finding agrees with a study done by Slaughter and Rhodes (2004) whose outcomes indicate that sometimes educational institutions promote 'academic capitalism' where they operate like business entities, measuring academic productivity through quantifiable metrics. Looking at the results of this study therefore it's quite open that the level of the academic staff job satisfaction is determined by available resources as well as the manner in which the institution treats its staff in the process of achieving institutional goals and objectives.

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4.1.2 Administrative and Leadership Styles and Support

Administrative and leadership styles and support emerged as a distinct driver to academic staff job satisfaction in the university Alpha and university Beta. Staff in university alpha expressed that they are not happy with the bureaucratic leadership structures that tend towards autocracy which they view as a strong factor against the academic staff job satisfaction. The study notes that the participants pointed out that decision making is noninvolvement, slow and always influenced with non-academic factors. Administrative appointments and promotions are highly politicized and ethinicized against the principal of meritocracy and motivation which is against job satisfaction.

Academic staff in university Alpha noted that:-

> "*Imagine in the university a simple thing like ordering a ream of photocopying paper takes weeks or even months. Nobody bothers about anything, in most cases we are forced to use our own money to get the papers in order to perform university tasks*". KII-4-F-A
>
> "*If you are not in the right tribe and know the correct people in the system then you might never be promoted in this university. You cannot be appointed to any committee in the university, not even in charge of water unless you have direct connection to the system".* KII-7-M-A

Of interest in university Beta the members of the academic staff demonstrated elements of administrative efficiency. Academic staff members in university Beta noted that the university was open to communication and took up any advice aimed at improving the institution. They further noted that the university was very quick to respond to any request made. They further expressed that despite the system being open, in most cases they were not involved in key decision making and the administrative structure was much rigid limiting inclusivity and therefore affecting the academic staff job satisfaction.

> "*This kind of administrative structure leads to some level of undue loyalty. To some extent it leads to sycophancy where individuals are forced to blindly follow management for recognition which is pure sycophancy that shy's away from the university set standards*". KII-3-M-B

The divergence in the university Alpha and university Beta in the manner in which they observe administrative structures and leadership styles reveals the differences in the motivation drivers between the two. The comparative qualitative analysis of University Alpha and University Beta reveals several key drivers of academic staff job satisfaction namely leadership style, administrative norms and other similar factors. The findings of this study further indicate that the levels of the academic staff motivation are dependent on the organizational support structures. The results from the qualitative inquiry in this study relate well with the study done by Harsonet et al. (2023) which argues that leadership style and educational institutional structures significantly influence an employee level of job satisfaction. Therefore this study demonstrates that an open system of leadership that is focussed on motivating workers tends to boost the staff morale and general output at work place, while leadership that promotes aspects that undermine best work practices tends to limit or hinder an employee level of job satisfaction. This findings tend to concur with the findings of a study done by Ulfah et al. (2023) who argues that a kind of leadership style that is transformative promotes high levels of job satisfaction and generally that is beneficial for the institution and the employee

In comparison between university Alpha and university Beta, University Alpha is characterised by poor administrative structures and leadership styles that affect that affect greatly the academic staff job satisfaction while university Beta has leadership styles that is open and transparent but limits the autonomy of the workers and involvement in key decision making processes. Both this institutions leadership practices affects the university academic staff job satisfactions at different levels. This finding tends to agree with the study done by Paz's (2021) indicating that poorly managed institutions in most cases struggle with promoting employee engagement and motivation due to underdeveloped human resource structures. However, of interest to note is that, this study reveals that university Alpha has very high numbers of qualified staff but subjected to bureaucratic leadership styles. The findings of this study confirms Herzberg's two factor theory of motivation as employed in this study where hygiene factors such as administrative efficiency and fairness in promotions are important drivers to job satisfaction even when they do not directly motivate academic staff members.

4.1.3 Workload and Work-Life Balance as a Driver to Job Satisfaction

In relation to the distribution of participants by number of learners per course in a semester this study demonstrates that the academic staff members in university Alpha deal with relatively high numbers of students compared with the academic staff in university Beta. University Beta has a clear workload policy that is manageable by members of the academic staff compared to university Alpha. This study notes that workload and its effects on work life balance is as a strong driver to academic staff job satisfaction. Staff in university Alpha reported excessive teaching load characterised by understaffing and high enrolment levels. Many respondents indicated that they ended up teaching several units up to four undergraduate and three post graduate courses including postgraduate supervision with very high number of students and sometimes over a thousand students in a course.

University Alpha respondents noted:-

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"*I teach from Monday to Friday, I have post graduate classes up to very late at night and sometimes, I have to fix post graduate classes over the weekend. I don't have time to conduct research, publish papers or even for personal development and family. My daughter told me she wouldn't admire my job seeing me on the table throughout*". KII-8-F-A

The heavy workload for members of the academic staff in university Alpha greatly affects the levels of job satisfaction. The staff are unable to conduct research, publish or engage in community engagement which ideally should be triadic is limited to just teaching. On the contrary the academic staff in university Beta reported more structured and practical workload allocation which in turn enabled the staff to conduct research, publish and actively participate in community engagement. However this study notes from the participants in the study it became clear that this structure also puts a lot of pressure to the academic staff members to meet specific performance targets which is closely monitored through regular appraisals.

"*I teach fewer hours compared to the academic staff in public universities, which gives us a lot of time to engage in other work related activities. But performance reviews are important and they are closely monitored by the university*. " KII-4-M-B

This study reveals that although in university Beta the academic staff appreciated the existence of clear workload policy that is practical and manageable they also noted that performance evaluation processes are very tight which is mentally involving. While in university Alpha the staff is over worked but they are left or minimally supervised. The overburdened workload in university Alpha limited their ability to engage in other personal and work related activities. This study reveals that the University academic staff workload and work-life balance differentiates the experiences of academic staff in public and private universities. These findings are in concurrence with a study done by Korir (2017), who demonstrated that academic staff workloads in public universities just like in university Alpha are never aligned with staff workload capacity, resulting in staff fatigue, reduced research output, and declining morale. In university Beta the academic staff have manageable work load which improves there efficiency levels and outputs however they are psychologically traumatised due to pressure to meet work targets.

Comparatively academic staff members in the two universities are subjected to some kind of pressure, one on meeting institutional targets and the other one in the form of performance anxiety. This outcome is in line with the finding of a study conducted by Harsonet et al. (2023) who identified this tension and named it "productivity paradox," where institutional efficiency and goal clarity improve output but can diminish intrinsic motivation if staff feel over-scrutinized. In summary, the qualitative findings demonstrate two distinct institutional drivers at play. In university Alpha, there were poor administrative concerns about the staff workload leading to demotivation, delays and performance stagnation while university Beta reflected an efficient system governed by rigid accountability mechanisms promoting institutional success but also inducing some level of stress academic staff members. These differences in institutional operations demonstrate the nature of working environment whether through infrastructure, leadership or workload to a larger extent shapes the academic staff job satisfaction.

4.2 Quantitative Analysis on the Role of Working Environment as a Driver

4.2.1 Descriptive Statistics

Fourteen participants were involved and tested on the study objective to ascertain the influence of work environment to the academic staff levels of job satisfaction in university Beta and Alpha. According to Table 2 below descriptive statistics from the simulated data on the two universities indicated that the mean on work environment was found to be 3.29, which is slightly above average on a 5 point scale. The mean on job satisfaction in the two universities Alpha and Beta was found to be 3.06 which is neutral or slightly satisfied and the standard deviation of academic staff job satisfaction was found to be 0.20 which is very low pointing out that work environment barely predicts job satisfaction conflicting with results from qualitative findings on university Alpha and university Beta. Results in table 2 further indicates that the minimum and maximum columns indicate the variation (limited) in academic staff levels of job satisfaction scores giving justification as to why the correlation with work environment is almost zero.

Table 2

Descriptive Statistics on Work Environment and Academic Staff Job Satisfaction

Variable	N	Mean	Std. Deviation	Minimum	Maximum
Work Environment (Independent Variable)	14	3.29	1.14	1	5
Job Satisfaction (dependent Variable)	14	3.06	0.20	2.7	3.4

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Table 3 Simulated Raw Scores

Participant	University Type	Work Environment (Scale 1-5) Independent Variable	Job Satisfaction (Scale 1-5) Dependent Variable
1	University Alpha	3	3.0
2	University Beta	4	3.1
3	University Beta	2	2.9
4	University Beta	5	3.2
5	University Alpha	3	2.8
6	University Beta	4	3.3
7	University Alpha	2	3.0
8	University Alpha	1	2.7
9	University Alpha	3	3.1
10	University Beta	5	3.4
11	University Alpha	2	2.9
12	University Beta	4	3.2
13	University Alpha	3	3.0
14	University Beta	5	3.3

From table three above the levels of job satisfaction in both university alpha and university Beta are almost consistent reflecting R= 0.0058 meaning that there is a very weak correlation while the standard deviation on job satisfaction residuals is estimated at 0.531 indicating consistency where work environment scores are varied across Likert scale 1-5 in both university Alpha and university Beta.

4.2.2 Regression Analysis on University Work Environment

The study employed a simple linear regression analysis formulae to assess the extent to which certain aspects and facilities within the working environment in the university such as leadership, infrastructure, collegial relationships, and administrative efficiency determines the level of university academic staff levels of job satisfaction in both university alpha and university Beta representing both public and private universities.

Table 4

General Influence of Working Environment on University Academic Staff Productivity

Model	R	R Square	Adjusted R Square	Std of Estimate
Working Environment	0.058	0.003	-0.080	0.531

As indicated in table 4 of this study the regression R models value of 0.058 indicates that there is a very weak positive correlation between the academic staff working environment in the university Alpha and university Beta in relation to academic staff job satisfaction. From the above analysis the R^2 value of 0.003 demonstrates that only 0.3% of the variance in productivity is accounted for by the selected environmental institutional drivers in both universities Alpha and Beta. On the other hand the negative adjusted R^2 value (-0.080) indicates a possible overestimation due to irrelevant institutional practices, indicating that the variables included may not meaningfully contribute to predicting job satisfaction outcomes across the entire sample in this study.

Table 5

Examination of Regression Model (ANOVA)

Source	Sum of Squares	df	Mean Square	F	Sig. (p)
Regression	0.110	1	0.110	0.040	0.844
Residual	3.386	12	0.282	-	-
Total	**3.397**	**13**	-	-	-

From table 5 above the outcome of the analysis indicates that regression model employed in this study is not statistically significant for example from the table F = 0.040, and p = 0.844. Although it's evident from a number of studies explored in chapter two that working environment if a vital determinant of the university academic staff job satisfaction the results from this analysis model explains otherwise. It's clear from this outcome that other moderating variables maybe related to higher job satisfaction therefore other drivers such as institutional policies could be a stronger drivers than working environment within the university.

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4.3 Synthesis of Quantitative and Qualitative Findings on working Environment as a Job Satisfaction Driver

From earlier discussion although the regression analysis demonstrated weak and statistically no significant relationship between working environment and academic staff job satisfaction as discussed in this study earlier, the qualitative study reveals that working environment is a strong driver to academic staff job satisfaction as indicated in table 6 below:-

Table 6

Results on the influence of Working Environment on University Academic Staff Job Satisfaction

Dimension	University Alpha	University Beta
Institutional infrastructure	Dilapidated, constrained	Ultra-modern
Administrative Structures	Bureaucratic, with autocratic tendencies	Effective
Leadership style	Detached, reactive	Focused and responsive
Workload	Heavy , overburdening	Manageable
Stress Contributors	Job security	Performance rewards, autonomy recognition
Job satisfaction drivers	Resource scarcity, unclear promotion criteria	Output pressure, evaluation fatigue

From the discussions in objective number one of this study, the findings reveal differences in experiences in the two institutions reflect systemic issues that need to be addressed. Public universities like University Alpha, which depends heavily on government sponsorship and funding, is characterised with resource limitations and inflexible bureaucracies characterising leadership styles. This therefore means that academic staff job satisfaction levels in public universities are limited by structural deficiencies rather than individual staff performance limitations. Private universities, on the other hand, such as University Beta, operate under company structures that prioritize performance, branding, and return on investment to meet institutional goals. While this can lead to more efficient systems and better working conditions, it can also commodify the academic role, potentially reducing academic staff job satisfaction for those who value intellectual freedom over institutional directives (Marginson, 2007).

Further, the study findings highlight a crucial tension between resource availability and academic freedom. In public universities, staff may enjoy more intellectual freedom but face infrastructural and administrative limitations. In private universities, staff benefits from resource-rich environments but are often subject to more rigid institutional policies and control measures. This tension is not necessarily composed of an individual academic staff choice but rather a force cleared by the institutions, therefore the universities must balance performance expectations with the professional dignity and well-being of their academic staff.

The qualitative findings of this study strongly align with existing literature on job satisfaction and organizational dynamics in institutions of education. As demonstrated by Harsonet et al. (2023), Ulfah et al. (2023), Korir (2017), and Paz (2021), the link between leadership, infrastructure, workload, and institutional practices are key drivers in shaping university academic staff job satisfaction. These study therefore calls for the need for differentiated strategies in both public and private universities for example in public universities therefore is need for investment in infrastructure and administrative reform's while in private universities there is need of enhancing academic voice and reducing performance induced stress .if this is adequately done then the academic staff in both institutions will experience significant levels of job satisfaction.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

In understanding the objective of this study and in answering the research question of this study, this study found out that while quantitative analysis models underscores the role of working environment as a critical driver to the university academic staff job satisfaction while qualitative explanations gave a contrary opinion indicating that university academic staff job satisfaction is influenced by work environmental conditions. In public universities represented by university Alpha the levels of job satisfaction is usually limited by structural inefficiencies, resource constraints while in private universities represented by university Beta, performance requirements were characterized by rigidity interferes with the benefits of better infrastructure therefore limiting the university academic staff job satisfaction.

5.2 Recommendations

This study would like to give the following policy recommendation. That both university Alpha and university Beta should improve university academic staff working conditions through investment in academic infrastructure and staff welfare. Both public (University Alpha) and private (University Beta) universities should consider creating conducive and well-resourced academic staff working environments. This includes modernizing office spaces,

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reducing workload pressure through strategic staff recruitment and deployment, providing adequate teaching and research facilities, and promoting academic staff work life balance. This study notes that strategic infrastructural investments and academic staff welfare policies are essential for promoting job self-satisfaction.

REFERENCES

Altbach, P. G. (2015). Academic freedom: International realities and challenges. *Higher Education, 70*(1), 59–67. https://doi.org/10.1007/s10734-014-9823-6

Chimanikire, P., Mutandwa, E., Gadzirayi, C. T., Muzondo, N., & Mutandwa, B. (2007). Factors affecting job satisfaction among academic professionals in tertiary institutions in Zimbabwe. *African Journal of Business Management, 1*(6), 166–175.

Harsonet, P., Lim, M., & Ngugi, L. (2023). Leadership style and job satisfaction in higher education institutions. *International Journal of Educational Management, 37*(2), 145–159.

Herzberg, F., Mausner, B., & Snyderman, B. (1959). *The motivation to work* (2nd ed.). John Wiley & Sons.

Korir, B. C. (2017). Influence of working conditions on teachers' job satisfaction in public secondary schools in Kenya. *International Journal of Advanced Research in Education & Technology, 4*(2), 22–27.

Kroll, T., Neri, M. T., & Miller, K. (2005). Using mixed methods in disability and rehabilitation research. *Rehabilitation Nursing, 30*(2), 106–113. https://doi.org/10.1002/j.2048-7940.2005.tb02465.x

Marginson, S. (2007). Global university rankings: Implications in general and for Australia. *Journal of Higher Education Policy and Management, 29*(2), 131–142. https://doi.org/10.1080/13600800701351660

Ng'ethe, J. M., Iravo, M. A., & Namusonge, G. S. (2012). Determinants of academic staff retention in public universities in Kenya: Empirical review. *International Journal of Humanities and Social Science, 2*(13), 205–212.

Odhiambo, G. (2014). Higher education in Kenya: An assessment of current responses to the imperative of widening access. *Higher Education Quarterly, 68*(4), 394–404.

Paz, R. A. (2021). Public universities in resource-constrained contexts: A critical review of institutional capacity and academic morale. *African Journal of Higher Education, 39*(1), 89–105.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Slaughter, S., & Rhoades, G. (2004). *Academic capitalism and the new economy: Markets, state, and higher education*. Johns Hopkins University Press.

Tettey, W. J. (2006). Staff retention in African universities: Elements of a sustainable strategy. World Bank. https://doi.org/10.1596/36697

Ulfah, M., Sugiyanto, F. X., & Rizky, D. A. (2023). The impact of organizational citizenship behavior and transformational leadership on teacher productivity. *International Journal of Educational Management, 37*(4), 615–631.

Wachira, F. M., Gitumu, M., & Mbugua, Z. (2017). Effect of principals' leadership styles on teachers' job performance in public secondary schools in Kieni West Sub-County. *International Journal of Humanities and Social Science Innovation, 6*(8), 72–86.

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The influence of infrastructure support on the performance of fruits and vegetables cold chain in Tanzania: A case of Arumeru and Hai districts

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ABSTRACT

The study sought to establish the influence of infrastructure support on the performance of the fruits and vegetables cold supply chain in Tanzania. Both Resource-Based Theory (RBT) and Resource Dependency Theory (RDT) were used. The study adopted a convergent parallel design, and a census technique was conducted on 114 fruit and vegetable actors from Arumeru and Hai districts. Additionally, 12 firms were purposefully selected to collect interview data from the same targeted population. Descriptive and inferential analyses were used to analyze data. The findings indicate that transport facilities, storage facilities, and road access have a positive and significant impact on the performance of the fruits and vegetables cold chain. Based on these findings, the study concluded that the unwillingness of the fruit and vegetable actors to use and apply proper cold distribution systems for their post-harvest fruits and vegetables is contributed to by the immaturity of the cold supply chain in Tanzania. The study recommends that fruit and vegetable members preserve the quality of their fresh produce by adopting an appropriate cold distribution system. Moreover, the government should collaborate with fruit and vegetable stakeholders to ensure accessibility of roads, cold storage, and cold transport facilities near fruit and vegetable actors at affordable costs. Furthermore, policymakers should expand their preference for fruit and vegetable actors located in rural areas in their future policies to boost proper usage, reduce post-harvest losses, stabilize prices, and increase the exportation of fresh produce to neighboring countries like Kenya, Uganda, Rwanda, and Burundi.

Keywords: Cold Supply Chain, Fruits, Performance, Vegetables

I. INTRODUCTION

For the past few years, the development of the cold chain has been important in contributing to the economic growth of developed and developing countries (Gligor *et al.*, 2018; Pambudi *et al.*, 2022; Bottani *et al.*, 2022; Nguyen *et al*., 2022). Several scholars have demonstrated that cold chains are key to improving human well-being, boosting economic growth, and delivering socioeconomic development through creating employment opportunities, reducing food loss, reducing poverty, and ensuring that all people enjoy health and prosperity (Peters & Sayin, 2022).

The key purpose of the cold supply chain is to ensure temperature is controlled from the point of production, through to the transportation stages, storage, distribution processes, and final delivery to the end-users (Nguyen *et al*., 2022). This is important in perishable products, especially fruits and vegetables (Raut *et al*., 2019). As a result, after the harvest, fresh fruits and vegetables need to pass through the precooling process, sorting, grading, and packaging, cold storage, transportation to the distribution center, temporally cold storage, distribution to wholesale/retail outlets, and then distribution to consumers (Peters & Sayin, 2022). However, in developing countries experiencing the growth trend of the cold chain, the main concern remains on the supply chain actors' capability to maintain the quality and safety of fruits and vegetables (Vrat *et al*., 2018).

The infrastructure issue has been a matter of debate in developing countries, particularly in the fruits and vegetables cold supply chain. It has been claimed that what matters most is to invest in infrastructure, such as cold storage, refrigerated trucks, and better computer hardware, which may not only improve the performance of the firm but also facilitate the reduction of perishable food loss (Raut *et al.*, 2019). Mercier *et al* (2018) highlighted that reefer trucks and cold warehouses are crucial in reducing the magnitude of fruit and vegetable loss. This contributes to the consistent availability of quality and adequate fruits and vegetables demanded by the customers, which in turn increases sales of the firm (Beretta *et al.*, 2019).

However, in Sub-Saharan Africa, access to cold storage facilities has been a major challenge, and this has been contributing to poor cold chain performance (Sibanda & Workneh, 2020). For instance, the magnitude of fruit and

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vegetable loss in Sub-Saharan Africa is estimated to be 50%, whereby 32% of loss occurs after the harvest (Makule *et al.*, 2022; Gunarathna & Bandara, 2020). In Tanzania, there is a need to improve the supply chain system of fruits and vegetables. The majority of traders do not consider temperature monitoring systems in terms of using cold transportation and storage to extend the shelf-life of fruits and vegetables during the distribution process (Yahya, 2020). So, the effect becomes quite bigger, especially in terms of price variability and loss of government revenue (Yahya, 2020).

To solve the problem, stakeholders at some points have been trying hard to modernize the supply chain of fruits and vegetables in Tanzania (Wakiariro, 2020). However, their efforts have not yet provided the desired outcome. Most fruits and vegetables had been losing their quality before reaching their destination, and to a great extent, supply chain members are unwilling and/or incapable of using cooling rooms, refrigerated vehicles, or hiring expertise to deal with the storage of their fruits and vegetables (Rutta, 2022; Baltazari *et al*., 2020). Several present studies have been conducted on the fruits and vegetables supply chain in Tanzania. Fewer focused on factors leading to post-harvest loss and waste of fruits and vegetables (Anand & Barua, 2022; Baltazari *et al*., 2020). Few studies documented the role of intermediaries in the fruits and vegetables supply chain (Issa *et al*., 2021; Mmasa, 2023). Msafiri and Mwombela (2021) focused on the competitiveness of the horticultural industry. While Wakiariro (2020) focused on horticultural logistics management in Tanzania.

However, little is known about the importance of cold transportation facilities, cold storage facilities, and road access in the fruits and vegetables business, especially when it involves temperature management systems in the supply chain process. This demonstrates that the performance of the cold chain for fruits and vegetables is still a problem that requires careful attention in Tanzania.

1.1 Research Questions

i. What is the influence of transportation facilities on the performance of the fruits and vegetables cold supply chain?
ii. How do storage facilities affect the performance of the fruits and vegetables cold supply chain?
iii. What is the effect of road access on the performance of the fruits and vegetables cold supply chain?

II. LITERATURE REVIEW

2.1 Theoretical Framework

The resource-based and resource dependency theories were used in this study.

2.1.1 Resources-Based Theory (RBT)

This theory was introduced by Penrose in 1959. It was first known as the resource-based view (RBV), which holds that a company can achieve a competitive edge through the efficient utilization of a v ariety of its special resources (Ali *et al*, 2018). This study prefers to use the term RBT because, up to 2011, the RBV had changed into the RBT, due to the justification that the RBV had become more sophisticated and resembled a theory than a viewpoint (Barney *et al*., 2011). The performance of an organization stems from its unique set of valuable, rare, and costly-to-imitate resources. When a business possesses superior resources compared to rivals, it can achieve a competitive edge, leading to better performance (Ardaneswari et al., 2020). A firm's success largely depends on effectively utilizing its tangible and intangible resources (Musa et al., 2022). Resources can be classified into physical, human, and organizational capital (Davis, 2019). Physical resources encompass buildings, equipment, and technology (Murimi et al., 2019), while human capital includes workforce skills, relationships, and experience (Lipwop & Achuora, 2021). Organizational capital relates to the firm's structure and culture (Chigara, 2021).

RBT is relevant to this study because it is believed that controlling the temperature of fresh goods is essential for ensuring their quality and safety (Li, 2021). However, inadequate physical resources, such as refrigerated vehicles and cold storage facilities, remain a challenge for the supply chain of fruit and vegetables (Anand & Barua, 2022; Bisht & Gupta, 2022). So, actors in the supply chain are advised to use special reefer trucks, cold warehouses, and facilities to maximize sales and profitability (Li, 2021; Dong et al., 2021). Jafarpour *et al*. (2022) show that warehousing and quality of storage can improve the cold supply chain performance. Henceforth, the theory supports this study.

The RBT is only based on the firm's internal resources; in fact, the organization also needs external resources that are owned by other stakeholders, which would have been impossible for an individual firm. In this study, RBT was supplemented by the resource dependency theory by giving a detailed explanation of how a firm may coordinate with external stakeholders to gain access to unique resources and improve performance.

2.1.2 Resources Dependency Theory (RDT)

This theory is based on the principle that a firm must coordinate with other stakeholders operating in its environment (external environment) to acquire the resources it needs to differentiate itself from its competitors (Orakwue & Iguisi, 2020). It shows that the motive behind coordination across the organization interdepends on vital inputs that cannot be obtained elsewhere. This is due to the reason a firm does not possess all the resources that are

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required in the entire process of value-creation (Gligor *et al.*, 2018). In addition, a firm lacking critical resources may be able to acquire them by forming an alliance or joint venture relationship with other business partners. In so doing, it would build capacities through merging unique resources, knowledge exchange, or investing in core resources required (Kim *et al.*, 2020). This theory is relevant to this study because an organization may opt to outsource or hire facilities such as cold warehouses, refrigerated trucks, and storage equipment to improve its performance (Raut *et al.*, 2019; Njoroge, 2022). Furthermore, small and large-scale farmers, distributors, and wholesalers depend on the government to improve road infrastructure and smooth the movement of fruit and vegetables from rural to urban areas (Pérez & Gómez, 2022).

2.2 Empirical Review

This part presents numerous studies related to the critical role of infrastructure support in the cold supply chain for fresh produce.

2.2.1 Transportation Facilities

The distribution system of fresh produce is supported by transportation models such as road transport, water transport, railway transport, and air transport (Lipwop & Achuora, 2021). In most cases, refrigerated trucks and air transport are preferred for the transportation of fruit and vegetables (Yusupjanovna, 2020). Refrigerated trucks are mostly used due to the remote location of farms and also facilitate door-to-door transportation, while air transport is used due to the speed of the model and long-distance purposes (Iordăchescu et al., 2019). Nuthalapati and Sharma (2021) suggest that investing in refrigeration transport equipment like reefer trucks facilitates the movement of the fruit and vegetables to a distant market without changing their nature. Based on the explanation above, it suggests that investing in cold transportation facilities is inevitable as long as the fruit and vegetable industry is concerned.

2.2.2 Storage Facilities

Cold storage facilities such as cold warehouses, storage equipment, and refrigerated containers (Raut et al., 2019). Help to extend the shelf life and preserve the freshness of fruit and vegetables, as well as to increase their availability (Yahaya & Mardiyya, 2019). Moreover, cold storage facilities are important, especially during the storage, distribution, and sales of perishable crops (Bottani et al., 2022). It also contributes much to balancing price fluctuation by providing stability in the demand and supply of fruits and vegetables (Bhatnagar et al., 2022). Dimoso *et al* (2021) stipulated that although cold storage facilities reduce the loss of fresh fruits and vegetables, in developing countries, a high number of perishable fruits and vegetables are lost due to the absence or inadequate cold storage rooms. This raises a concern that fresh fruits and vegetables should not be exposed to sunlight for a long time after harvest (Cloete *et al*., 2021). Beckles et al. (2025) argue that postharvest loss caused by microbial, insect, and sunlight can also be reduced due to the use of a cold storage room, and finally ensure the availability of nutritious produce to end users. The dialog above highlighted how cold storage facilities play a crucial part in improving the performance of the fruits and vegetables cold supply chain.

2.2.3 Road Access

The transportation process of fresh fruits and vegetables requires access to suitable infrastructures like roads that link farmers and the markets to facilitate the movement and enhance the availability of fresh produce to the outlet area (Makule et al., 2022). It is believed that roadblocks and congestion are major inconvenient situations that may cause unexpected delays during delivery (Turan & Ozturkoglu, 2022). Xie *et al* (2022) reveal that enhancing multimodal transportation requires improving the road infrastructure because it makes it easier to coordinate and integrate the networks for rail, sea, and air transportation. Dube *et al* (2018) argue that in order to reduce post-harvest loss, roads must be in good shape. This is done by reducing travel time to markets and minimizing transit damage. Similarly, Gunarathna and Bandara (2020) argue that the lack of infrastructure, such as roads in rural areas, is the reason for the postharvest loss of vegetables. However, in fewer areas, there are roads that link farmers and markets, but the main obstacle remains the bad condition of available roads, especially during rainy seasons (Dube *et al*., 2018). These perceptions indicate that the performance of the cold chain for fruit and vegetables relies heavily on the condition of roads.

III. METHODOLOGY

3.1 Research Design

This study employed a convergent parallel design. This parallel design requires the collection of both quantitative and qualitative data collected simultaneously and then comparing them to see similarities or differences (Liu et al., 2022; Sileyew, 2019). Due to the complexity of this approach, under this study, the quantitative statistical results were provided first, followed by qualitative quotes to support or disconfirm the quantitative results. This design

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was adopted because it offers a chance to combine both quantitative (QUANT) and qualitative (QUAL) data to develop a comprehensive understanding of the research problem and help in drawing the research conclusion. Also, to reconcile the disparities in methodology between the quantitative and qualitative paradigms. So, this design allowed the researcher to conduct the study in a wide area at a reasonable cost and time.

3.2 Study Area

This study was carried out in the Arumeru and Hai districts, situated in the Arusha and Kilimanjaro regions, respectively. The two geographical locations were selected because of the long historical investment in the production of fruits and vegetables that feed the Arusha and Moshi regions (De Blasis, 2020). Moreover, the proximity of both districts to Kilimanjaro International Airport (KIA) is significant, as the airport offers facilities, such as cold storage, to most farmers, wholesalers, and exporters using KIA for the export of their fruits and vegetables (ITC, 2022). Finally, the existence of entities such as Tanzania Horticulture Association (TAHA) Fresh Handling Ltd (TFHL), which provides refrigerated transportation and associated services, indicates familiarity with cold chain procedures among participants in these areas (TAHA, 2021).

3.3 Population, Sampling Technique, and Sample Size

The population of this study was fruit and vegetable members (large producers, smallholder farmers, wholesalers, retailers, manufacturing companies, and exporters) found in Arumeru and Hai districts. This study consisted of a population of 114 respondents, and a census technique was used, whereby data were collected from every single element of the population in order to deliver information that is more accurate and precise. Thus, the sample of this study is the entire population of 114 respondents. Similarly, 12 firms from the same targeted population were selected purposively for collecting qualitative data through the interviews. The qualitative respondents included officials from two small-scale farmers, three larger-scale farmers, two retailers, one logistics company, two exporters, and one cold packinghouse.

3.4 Data Collection

This study used primary data only, whereby structured questionnaires were distributed to 114 respondents, while an interview guide was used to conduct in-depth interviews with 12 key informants during data collection. The structured questionnaires in a 5-point Likert scale (1- strongly agree to 5- strongly disagree) were applied to all variables to warrant consistency of responses. An interview guide with questions related to the fruits and vegetables cold chain was used through phone calls and face-to-face interviews to gain insights that enrich the quantitative results. To ensure data validity and reliability, a pilot study was undertaken where 15 questionnaires were issued to 12 firms, and 13 were returned. Following the guidance of Saunders et al. (2023), the sample size was 10% of the entire population. This technique allowed the researcher to discover and resolve problems in both the questionnaire and interview guide before the actual data gathering.

3.5 Data Analysis

In this study, data were analyzed using descriptive statistics and inferential analysis with the help of SPSS version 27. Descriptive statistics were applied using mean and standard deviation, while skewness and kurtosis values were used to assess normality of the data (Kline, 2023). In addition, Cronbach's alpha was used to measure the internal consistency of the constructs. The study involved a factor analysis in order to deduce poorly loading items for both independent and dependent variables before inferential analysis. Further, the multiple regression analysis was carried out to verify the contribution of each sub-variable.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Response Rate

The questionnaire was sent to 114 firms, with 107 (93.9%) returned without missing values. All 12 respondents participated in interviews without missing responses. Skewness and kurtosis were used to assess data normality, with Kline (2023) indicating that values should be less than 3 and 10, respectively, for normal distribution. The results in Table 1 indicate skewness values between 0.652 and 1.453, and kurtosis values ranging from -0.561 to 1.1708, suggesting the data is normally distributed. It also presents the mean scores for each sub-variable. According to Yang (2023), a mean score of 1 to 1.80 indicates high agreement from respondents, 1.81 to 2.60 suggests moderate agreement, 2.61 to 3.40 reflects neutrality, 3.41 to 4.20 indicates disagreement, and 4.21 to 5 denotes strong disagreement. Descriptive statistics are further supported by interview findings.

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Table 1

Descriptive Statistics and Normality Test

Variable	N	Mean	Std. Dev.	Skewness	Kurtosis
Transport facilities	107	1.97	.787	.970	1.069
Storage facilities	107	2.30	.979	.959	.276
Road access	107	2.04	.895	1.453	1.708
Performance of the fruits and vegetables cold chain	107	1.97	.563	.652	-.561

4.1.2 Transport Facilities

Table 1 shows that transport facilities have a total mean score of 1.97, representing a moderate level of agreement. The practical implication is that the increase in foreign earnings from US $ 64 million in 2004 to US $ 779 million in 2019 for fruits and vegetable exportation from Tanzania as per TAHA (2021) was highly contributed by the rise of awareness and willingness to fruits and vegetable actors in using or investing in cold infrastructure like cold transport facilities which is a crucial requirement for the most of foreign markets. Despite this improvement revealed in the fruits and vegetables sub-sector, there are still constraints revealed during interviews between the researcher and officers in Maji ya chai and Machame, representing the Arumeru and Hai districts, respectively. One respondent said:

> "*Our organization faces the challenge of inadequate refrigerated vehicles. The reefer vans we own are not enough to accommodate all the fruits and vegetables we produce. Therefore, sometimes when there is a need, we hire them from neighbors to move fresh produce from the farm to storage or the airport for exportation purposes" (Respondent 1, 2023).*

Another respondent said that:

> *"In case of handling equipment, we have adequate, stable, and durable plastic bins that we always use to facilitate storage in our cold warehouse and transport of fresh green beans. However, we don't own any refrigerated vehicles; instead, we are in partnership with another firm that carries our product" (Respondent 3, 2023).*

4.1.3 Storage Facilities

The respondents moderately agreed that cold storage facilities are an important aspect of enhancing the performance of the fruits and vegetables cold chain, as shown by a mean score of 2.30. This finding implies that the majority of actors of fruits and vegetables included in this study were using cold rooms for the storage of their fruits and vegetables, which appeared to be vital for the better performance of their businesses. This result is supported by interview results, as one respondent stated that:

> *"Even though we are doing great and able to store large quantities of our and customers' fresh produce, we still face challenges of inadequate plastic bins, as sometimes we hire from other packing houses, and the space of our cold rooms is not adequate to accommodate all farmers' fruits and vegetables around our area" (Respondent 7, 2023).*

Another respondent said that:

> *"The increase in the number of fruit and vegetable exporters has increased the need for modern cold storage infrastructures due to different standards established in foreign countries' markets. Hence, these fewer available cold packing houses at Arusha and Kilimanjaro are not enough to handle all fresh produce, even from Arusha and Kilimanjaro" (Respondent 8, 2023).*

4.1.4 Road Access

The mean score of 1.99 exposed that accessibility of roads is a crucial factor in facilitating the performance of the cold chain for the fruits and vegetables cold chain. This implies that the majority of fruit and vegetable actors allocated at Arumeru and Hai districts can move their fresh produce from farms or business areas to other places for consumption, due to the availability of roads that are in good condition and accessible. The quantitative finding differs from the interview result because one respondent said:

> *"The issue of ensuring the availability of good and accessible roads is still a problem that needs to be addressed, especially roads that connect interior farms and main roads. The problem becomes much bigger in the rainy season as the majority of transporters refuse to pick up produce from our temporary stores. So, we have to incur additional costs of road maintenance to smooth the operations" (Respondent 10, 2023).*

4.1.5 Reliability Test and Factor Analysis

The study assessed the internal consistency of all constructs, with Saunders *et al*. (2023) indicating that a minimum Cronbach's alpha of 0.70 is necessary for reliability. As shown in Table 2, all constructs met this criterion:

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transport facilities (0.812), storage facilities (0.841), road access (0.723), profitability (0.705), and responsiveness (0.710). This confirms the data set's suitability for further analysis.

The study conducted a factor analysis to identify poorly loading items for both independent and dependent variables, utilizing Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity to assess data suitability. Kalkbrenner (2021) emphasizes that a KMO value of 0.6 or higher and a P-value below 0.05 are necessary for effective factor analysis. Principal Component Analysis (PCA) was used for extraction to reduce dimensionality, with VARIMAX rotation applied for non-orthogonal factors. A minimum eigenvalue of 1.0 was selected as a standard, aligned with Reddy & Kulshrestha (2019), while a loading cut-off of 0.6, endorsed by Taherdoost et al. (2022), marked items as very good.

The results indicated that all infrastructure support constructs were suitable for factor analysis, with a KMO test of 0.808 and a significant Bartlett's Test of Sphericity (Chi-square = 850.851, df = 78, $p < 0.001$). For FVCC performance, the KMO was 0.725, and Bartlett's Test was significant (Chi-square = 201.078, df = 21, $p < 0.001$). Table 2 shows the rotated factor matrix, using a cut-off of 0.6. For infrastructure support, items V401e, V402c, V402d, V40b, and V403e were discarded, while for FVCC performance, only item V802c was removed.

Table 2

Rotated Factor Matrix and Scale Analysis for Constructs

Variable	Code	Constructs	Cronbach's Alpha	Question Code	Scores
				V401b	.892
				V401d	.891
	V401	Transport facilities	.812	V401f	.767
				V401a	.728
				V401c	.649
				V402a	.820
				V402f	.789
Infrastructure	V402	Storage facilities	.841	V402b	.769
support				V402g	.753
				V402e	.643
	V403	Road access	.723	V403a	.839
				V403d	.781
				V403c	.717
				V801a	.753
	801	Profitability	.705	V801d	.721
				V801b	.689
Performance				V801c	.667
of FVCC				V802d	.829
	802	Responsiveness	.710	V802b	.758
				V802a	.730

4.1.6 Regression Analysis

The multiple linear regression analysis was used to determine the statistical relationships between predictors (independent variables) and dependent variables, as well as to indicate the contribution of each predictor to the dependent variable, as presented in the coefficient table.

Table 3

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.841[a]	.707	.698	.30908

a. Predictors: (Constant), Road access, Transport facilities, Training, Storage facilities, Experience

b. Dependent Variable: Performance of the fruits and vegetables cold chain

In Table 3, the results indicate that predictors had a stronger relationship with the performance of the fruits and vegetables cold chain, as evidenced by a correlation coefficient (R) of 84.1%. The R-squared shows 0.707 percent, illustrating that the model explains 70.7% of the variance in the performance of the fruits and vegetables cold supply chain and leaves 29.3% unexplained. This means the model used was a good predictor for the relationship between independent variables and dependent variables. Moreover, Table 4 presents the analysis of variance. The concern in the

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ANOVA table was on the P-value, as it indicates whether the model is significant or not. For a model to be significant, the P-value must be equal to or less than 0.05.

Table 4

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.741	3	7.914	82.839	.000[b]
	Residual	9.840	103	.096		
	Total	33.581	106			

a. Dependent Variable: Performance of the fruits and vegetables cold chain

b. Predictors: (Constant), Road access, Transport facilities, Storage facilities

The results represented in Table 4 revealed that the overall model was statistically significant because F (7.914 ÷ 0.096) = 84.686, and the P-value was 0.000. The result implies that the overall regression analysis was statistically significant. This means predictors such as transport facilities, storage facilities, and road access influenced the performance of the fruits and vegetables cold supply chain. Furthermore, the regression coefficient was used to show the extent to which each predictor explains the variance of a dependent variable while holding other predictors constant. Vide Table 5 below;

Table 5

Coefficient Table

Model	Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.625	.095		6.610	.000
	Transport facilities	.235	.053	.328	4.465	.000
	Storage facilities	.281	.043	.489	6.566	.000
	Road access	.116	.036	.185	3.184	.002

From Table 5, the result shows that storage facilities had the highest significant contribution to the performance of the fruits and vegetables cold chain (beta = 0.281, P-value = 0.000). Transport facilities followed, which had a significant contribution (beta = 0.235, P-value = 0.00), and finally, road access had a significant contribution (beta = 0.116, P-value = 0.002) on the performance of the fruits and vegetables cold chain.

4.2 Discussion

4.2.1Transportation Facilities and the Performance of the Fruits and Vegetables Cold Supply Chain

The descriptive analysis and qualitative results indicate that cold transportation is important in ensuring the availability of fresh fruits and vegetables in the markets. The study findings are in line with the findings of the study conducted by Lipwop and Achuora (2021) and Alulu *et al* (2023), who found that cold transport facilities influence the performance of fresh produce firms. In addition, Raut *et al* (2019) exposed that the lack of proper cold transportation facilities affects the efficiency of the fruit and vegetable supply chain because it causes a mismatch of fresh produce quality as well as an imbalance between the supply and demand of fruit and vegetables. In Tanzania, road transport seems to be mostly used as a model of transport. Hence, fruit and vegetable businessman should purchase enough handling facilities, refrigerated vehicles, and reefer trailers that will be used to accommodate their fresh produce and simplify the distribution process while maintaining product quality and reducing loss.

4.2.2 Storage Facilities and the Performance of the Fruits and Vegetables Cold Supply Chain

However, the study uncovered that storage facilities had a significant contribution to the performance of the fruits and vegetables cold chain. In Tanzania, the distribution system particularly for fresh fruit and vegetables still not doing well because the majority of supply chain members are using bamboo baskets (tenga) to carry fresh produce from farm to other destinations, fresh produce is exposed to sunlight for a long time after harvest, inadequate of cold warehouse and the majority of available cold warehouse do not meet the standard for instance, most of them have no appropriate cooling units that ensure proper management of warehouses, and lack of cold room at airports and ports for example, the report provided by Ministrty of Agriculture (MOA) exposed that currently, only Kilimanjaro International Airport (KIA) provide cold storage service(MOA, 2019). Rutta (2022) in his study exposed that the slow growth of fruit and vegetable industries in Tanzania is highly associated with the unwillingness of supply chain actors, including small-scale farmers, to use cold storage infrastructure in their respective businesses due to the belief that it increases unnecessary expenses, especially when the focus is on a local market. All these act as the reasons that weaken the growth of the fruits and vegetables cold supply chain in Tanzania.

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4.2.3 Road Access and the Performance of the Fruits and Vegetables Cold Supply Chain

The study found that road access influences the performance of the fruits and vegetables cold supply chain. This finding agrees with a study conducted by Makule *et al* (2022), which suggested that to increase the availability of fresh fruits and vegetables in the market areas, the improvement of road conditions should be taken into consideration. So, the government and private sectors should collaborate to ensure that well and adequate roads are constructed, especially from rural and some urban areas to main roads. Additionally, these findings confirm the resource dependency theory that a firm cannot possess all the resources needed, but can attain other crucial resources through coordinating with its external environment. In this case, better coordination between the government and the fruits and vegetables stakeholders can alleviate the bad condition of roads. Doing so will facilitate the smooth flow of fruits and vegetables and reduce postharvest loss of perishable produce due to timely delivery. Thus, improving the performance of the fruit and vegetable cold supply chain in Tanzania.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The immaturity of the cold supply chain in Tanzania, particularly in the fruits and vegetables industry, in terms of the willingness of the supply chain members to use and apply proper distribution systems for their post-harvest fruits and vegetables, motivated this study to be conducted. Hence, the predictors included in this study provide new insight to all stakeholders on how to improve the performance of the fruits and vegetables cold chain in developing countries like Tanzania. Apart from contributions, the study also came across some limitations that could limit the generalization of the study findings. First, the study lacked a sampling framework due to the availability of a small population of fruit and vegetable actors who could offer detailed and sufficient information about the cold supply chain. This resulted in the adoption of the census technique. Furthermore, the generalization provided in this study cannot be guaranteed to be used in developed countries because the study was conducted in one of the developing countries (Tanzania).

5.2 Recommendations

The study provides a lesson to all supply chain members of fruits and vegetables operating their businesses in developing countries like Tanzania, particularly on increasing willingness to use appropriate cold distribution systems to ensure that fresh products reach ultimate customers of high quality and good for their health. Doing so will increase the availability of fruits and vegetables not only in local markets but also in neighboring countries, especially Kenya, Uganda, Rwanda, and Burundi. Also, it will contribute to stabilizing the price of fresh produce within the country.

The study findings recommend that a Private-Public Partnership (PPP) could effectively enhance cold chain infrastructure in Tanzania. By building more cold storage and transport facilities and improving access roads with the close cooperation of fruit and vegetable stakeholders, these services can become more available and affordable for local fruit and vegetable producers. This approach can encourage the adoption of proper cold distribution systems, reduce post-harvest losses, and boost exports and national income.

Regardless of the policymakers' efforts to address fresh produce loss and waste in Tanzania. Only, some larger-scale farmers are investing in proper cold supply chain management, many local small-scale farmers and distributors continue using inadequate methods, such as storing fruits and vegetables in tenga and exposing them to sunlight during transport and storage. Future policies and programs should involve a wide range of stakeholders, particularly those in rural areas, to effectively tackle the challenges faced in the fruit and vegetable supply chain. This includes improving transportation and storage technologies to reduce post-harvest losses.

REFERENCES

Ali, I., Nagalingam, S., & Gurd, B. (2018). A resilience model for cold chain logistics of perishable products. *The International Journal of Logistics Management, 29*(3), 922-941.

Alulu, J., Makyao, M., Huyskens-Keil, S., Lenz, B., Muendo, K. M., Mganilwa, Z., & Mithöfer, D. (2023). Distribution, transportation, and coordination in African indigenous vegetable value chains: A scoping review. *Frontiers in Environmental Economics, 2*, 1113826. https://doi.org/10.3389/frevc.2023.1113826

Anand, S., & Barua, M. K. (2022). Modeling the key factors leading to post-harvest loss and waste of fruits and vegetables in the Agri-fresh produce supply chain. *Computers and Electronics in Agriculture, 198*, 106936. https://doi.org/10.1016/j.compag.2022.106936

Ardaneswari, D. P. C., Novi, H., & Andan, L. R. (2020). The influence of internal factors on business performance: A resource-based view of mushroom SME in Indonesia. *Russian Journal of Agricultural and Socio-Economic Sciences, 97*(1), 107-112.

Licensed Under Creative Commons Attribution (CC BY-NC)

Baltazari, A., Mtui, H., Chove, L., Msogoya, T., Kudra, A., Tryphone, G., & Mwatawala, M. (2020). Evaluation of post-harvest losses and shelf life of fresh mango in the Eastern zone of Tanzania. *International Journal of Fruit Science, 20*(4), 855-870.

Barney, J. B., Ketchen, D. J., & Wright, M. (2011). The future of resource-based theory: Revitalization or decline? *Journal of Management, 37*(5), 1299-1315.

Beckles, D. M., Kader, A., Reid, M. S., Jiang, C. Z., & Cantwell, M. I. (2025). *Postharvest technology of horticultural crops* (4th ed., Vol. 21661). UCANR Publications.

Beretta, W., Wu, W., Cronje, P. C., Hellweg, S., & Defraeye, T. (2019). Environmental trade-offs in fresh-fruit cold chains by combining virtual cold chains with life cycle assessment. *Applied Energy, 254*, 113586. https://doi.org/10.1016/j.apenergy.2019.113586

Bhatnagar, A., Shankar, R., & Vrat, P. (2022). Demand-supply planning and the sustainability aspect for agro-based perishables in the cold chain. *International Journal of Industrial and Systems Engineering, 40*(1), 79-103.

Bisht, S., & Gupta, A. (2022). An insight into Indian fruits and vegetables SMEs supply chain: Indian agrarian sectors. *ECS Transactions, 107*(1), 11169.

Bottani, E., Casella, G., Nobili, M., & Tebaldi, L. (2022). An analytic model for estimating the economic and environmental impact of the food cold supply chain. *Sustainability, 14*(8), 1-16. https://doi.org/10.3390/su14084771

Chigara, H. (2021). Resource-Based View and competitiveness: An empirical study. *International Journal of Economic Performance (IJEP), 4*(1), 432.

Cloete, L., Picot-Allain, C., Ramasawmy, B., Neetoo, H., Ramful-Baboolall, D., & Emmambux, M. N. (2023). Drivers and barriers for the commercial uptake of edible coatings for the fresh fruits and vegetables industry: A review. *Food Reviews International, 39*(6), 3481-3514.

Davis, P. J. (2019). Training employees to be a source of sustained competitive advantage. *The Journal of Applied Business and Economics, 21*(5), 29-39.

De Blasis, F. (2020). Global horticultural value chains, labor, and poverty in Tanzania. *World Development Perspectives, 18*, 100201. https://doi.org/10.1016/j.wdp.2020.100201

Dimoso, N., Aluko, A., Makule, E., & Kassim, N. (2021). Challenges and opportunities toward sustainable consumption and value addition of cashew apples in Tanzania. *Outlook Agriculture, 50*(2), 169–177.

Dong, Y., Xu, M., & Miller, S. A. (2021). Overview of cold chain development in China and methods of studying its environmental impacts. *Environmental Research Communications, 2*(12), 1-15.

Dube, S., Paremoer, T., Jahari, C., & Kilama, B. (2018). Growth and development of the fruit value chain in Tanzania and South Africa. *SSRN Electronic Journal*. https://dx.doi.org/10.2139/ssrn.3244308

Gligor, D., Tan, A., & Nguyen, T. N. T. (2018). The obstacles to cold chain implementation in developing countries: Insights from Vietnam. *The International Journal of Logistics Management, 29*(3), 942-958.

Gunarathna, R. T., & Bandara, Y. M. (2020). Post-harvest losses and the role of intermediaries in the vegetable supply chain. *2020 Moratuwa Engineering Research Conference (MERCon)*, IEEE, 378-383. https://doi.org/10.1109/MERCon50084.2020.9185197

International Trade Centre. (2022). United Republic of Tanzania: Invisible barriers to trade. *Business perspectives*. Geneva: ITC.

Iordăchescu, G., Ploscutanu, G., Pricop, E. M., Baston, O., & Barna, O. (2019). Postharvest losses in transportation and storage for the fresh fruits and vegetables sector. *Journal of International Scientific Publications, 7*, 244-251.

Issa, I. M., Munishi, E. J., & Mubarack, K. (2021). Constraints to intermediaries' role in the provision of market and marketing services for the urban fresh fruits and vegetables supply chain. *Business Education Journal (BEJ), 10*(3), 12. https://www.ajol.info/index.php/bej/article/view/234745

Jafarpour, M., Shojaei, P., & Alimohammadlou, M. (2022). A model for improving cold supply chain performance: An integrated FISM/BWM/ANP approach. *International Journal of Procurement Management, 15*(5), 599-624.

Kalkbrenner, M. T. (2021). Enhancing assessment literacy in professional counseling: A practical overview of factor analysis. *Professional Counselor, 11*(3), 267-284.

Kim, S. T., Lee, H. H., & Hwang, T. (2020). Logistics integration in the supply chain: A resource dependence theory perspective. *International Journal of Quality Innovation, 6*(1), 1-14.

Kline, R. B. (2023). *Principles and practice of structural equation modeling* (5th ed.). Guilford Publications.

Li, G. (2021). Development of cold chain logistics transportation system based on 5G network and Internet of Things system. *Microprocessors and Microsystems, 80*, 1-6.

Lipwop, M. C., & Achuora, J. (2021). Cold chain logistics and the performance of fresh produce firms in Nairobi City County, Kenya. *International Research Journal of Business and Strategic Management, 2*(2), 489-504.

Liu, J., Hung, P., Liang, C., Zhang, J., Qiao, S., Campbell, B. A., & Li, X. (2022). Multilevel determinants of racial/ethnic disparities in severe maternal morbidity and mortality in the context of the COVID-19 pandemic

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in the USA: Protocol for a concurrent triangulation, mixed-methods study. *BMJ Open, 12*(6), e062294. https://doi.org/10.1136/bmjopen-2022-062294

Makule, E., Dimoso, N., & Tassou, S. A. (2022). Precooling and cold storage methods for fruits and vegetables in Sub-Saharan Africa—A review. *Horticulturae, 8*(9), 1-15. https://doi.org/10.3390/horticulturae8090776

Mashenene, R. G., & Kumburu, N. P. (2023). Performance of small businesses in Tanzania: Human resources-based view. *Global Business Review, 24*(5), 887-901. https://doi.org/10.1177/0972150920927358

Mercier, S., Mondor, M., Villeneuve, S., & Marcos, B. (2018). The Canadian food cold chain: A legislative, scientific, and prospective overview. *International Journal of Refrigeration, 88,* 637-645. https://doi.org/10.1016/j.ijrefrig.2018.01.006

Ministry of Agriculture. (2019). *National Post-Harvest Management Strategy (NPHMS) 2019-2029*. United Republic of Tanzania.

Mmasa, J. J. (2023). Partial intermediary value-chain coordination and its effects on the productivity of sweet potato in Tanzania. *African Journal of Food, Agriculture, Nutrition and Development, 23*(3), 22624-22649.

Msafiri, D., & Mwombela, S. (2021). Enhancing competitiveness of the horticultural industry in Tanzania. *Research on Poverty Alleviation (REPOA)*. https://www.repoa.or.tz/wp-content/uploads/2021/06/Horticulture-PB.pdf

Murimi, M. M., Ombaka, B., & Muchiri, J. (2019). Influence of strategic physical resources on performance of small and medium manufacturing enterprises in Kenya. *International Journal of Business and Economic Sciences Applied Research, 12*(1), 20-27.

Musa, D., Ghani, A. A., & Ahmad, S. (2022). Resource-based view theory on business performance and firm strategic orientation. *International Journal of Education, Islamic Studies and Social Science Research, 7*(1), 89-97. http://dx.doi.org/10.6007/IJARBSS/v12-i10/15103

Nguyen, N. A. T., Wang, C. N., Dang, L. T. H., & Dang, T. T. (2022). Selection of cold chain logistics service providers based on a Grey AHP and Grey COPRAS framework: A case study in Vietnam. *Axioms, 11*(4), 1-24. https://doi.org/10.3390/axioms11040154

Njoroge, K. K. (2022). Cold supply chain management and financial performance of pharmaceutical companies in Nairobi, Kenya (Doctoral dissertation). University of Nairobi.

Nuthalapati, C. S., & Sharma, R. (2021). Requirement and availability of cold-chain for fruits and vegetables in the country. *Research Study Report*, Ministry of Agriculture and Farmers' Welfare, Government of India.

Orakwue, A., & Iguisi, O. (2020). Conceptualizing entrepreneurship in human resource management. *International Journal of Research in Business and Social Science, 9*(3), 85-93.

Pambudi, N. A., Sarifudin, A., Gandidi, I. M., & Romadhon, R. (2022). Vaccine cold chain management and cold storage technology to address the challenges of vaccination programs. *Energy Reports, 8,* 955-972. https://doi.org/10.1016/j.egyr.2021.12.039

Pérez, L. F., & Gómez, M. I. (2022). Public-private strategies to establish a successful avocado export cycle: Cases from Colombia. *Journal of Agribusiness in Developing and Emerging Economies, 12*(4), 620-640.

Peters, T., & Sayin, L. (2022). The cold economy. *ADBI Working Paper 1326*. Tokyo: Asian Development Bank Institute. https://www.adb.org/publications/the-cold-economy

Raut, R. D., Gardas, B. B., Narwane, V. S., & Narkhede, B. E. (2019). Improvement in food losses in the fruits and vegetable supply chain from a cold third-party logistics approach. *Operations Research Perspectives, 6*, 100117. https://doi.org/10.1016/j.orp.2019.100117

Reddy, L. S., & Kulshrestha, P. (2019). Performing the KMO and Bartlett's test for factors estimating warehouse efficiency, inventory, and customer satisfaction for the e-retail supply chain. *International Journal for Research in Engineering, Application & Management, 5*(9), 1-13.

Rutta, E. W. (2022). Barriers impeding the deployment and uptake of solar-powered cold storage technologies for postharvest loss reduction in the tomato value chain in Africa (Doctoral dissertation). Queen's University (Canada).

Saunders, M. N. K., Lewis, P., & Thornhill, A. (2023). *Research methods for business students* (9th ed.). Pearson.

Sibanda, S., & Workneh, T. S. (2020). Potential causes of postharvest losses and low-cost cooling technology for fresh produce farmers in Sub-Saharan Africa. *African Journal of Agricultural Research, 16*(5), 553-566.

Sileyew, K. J. (2019). Research design and methodology. In *Cyberspace*. IntechOpen. https://www.intechopen.com/books/cyberspace/research-design-and-methodology

Taherdoost, H. A. M. E. D., Sahibuddin, S., & Jalaliyoon, N. E. D. A. (2022). Exploratory factor analysis: Concepts and theory. *Advances in Applied and Pure Mathematics, 27*, 375-382. https://ssrn.com/abstract=417868

Tanzania Horticulture Association. (2021). *TAHA strategic plan 2022-2026.* https://taha.or.tz/taha-strategic-plan-2022-2026-final

Turan, C., & Ozturkoglu, Y. (2022). A conceptual framework model for an effective cold food chain management in a sustainable environment. *Journal of Modelling in Management, 17*(4), 1262-1279.

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Vrat, P., Gupta, R., Bhatnagar, A., Pathak, D. K., & Fulzele, V. (2018). Literature review analytics (LRA) on sustainable cold chain for perishable food products: Research trends and future directions. *Opsearch, 55*(3), 601-627.

Wakiariro, C. P. (2020). The state of horticultural logistics management of international trade in Tanzania (Doctoral dissertation). Institute of Accountancy, Arusha.

Xie, R., Huang, H., Zhang, Y., & Yu, P. (2022). Coupling relationship between cold chain logistics and economic development: An investigation from China. *PLOS ONE, 17*(2), e0264561. https://doi.org/10.1371/journal.pone.0264561

Yahaya, S. M., & Mardiyya, A. Y. (2019). Review of post-harvest losses of fruits and vegetables. *Biomedical Journal of Scientific & Technical Research, 13*(4), 10192-10200.

Yahya, A. (2020). Assessment of factors affecting vegetable supply chain performance in Tanzania: A case of selected regions (Doctoral dissertation). Mzumbe University.

Yang, M. (2023). The impact of blended learning on Chinese middle school students' interest in learning during COVID-19. *Lecture Notes in Education, Psychology and Public Media, 6*, 144-153. https://doi.org/10.54254/2753-7048/6/20220219

Yusupjanovna, T. R. (2020). Fruits and vegetables: Problems of their delivery to the consumer and solutions. *International Journal on Integrated Education, 3*(12), 336-338. https://doi.org/10.31149/ijie.v3i12.1031

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APPENDIX I

Interviewee Details

Respondent ID	**Type of business**	**Category of the firm's experience**
Respondent 1	Larger-scale farmers	Above 20 years
Respondent 2	Farmers' organization	16-20 years
Respondent 3	Larger-scale farmers	6-10 years
Respondent 4	Small-scale farmers	16-20 years
Respondent 5	Logistics company	11-15 years
Respondent 6	Retailer	6-10 years
Respondent 7	Exporter	16-20 years
Respondent 8	Cold packinghouse	Below 5 years
Respondent 9	Exporter	6-10 years
Respondent 10	Larger-scale farmers	6-10 years
Respondent 11	Small-scale farmers	11-15 years
Respondent 12	Retailer	11-15 years

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Local government leadership strategies in land dispute resolution: Insights from Buhigwe District, Tanzania

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ABSTRACT

This study examined the influence of local government leadership on resolving land conflict in Buhigwe District, Tanzania, a common form of social grievance and hindrance to development. Using transformational leadership theory as a theoretical lens for the study, a quantitative, positivist approach was applied, which involved surveys using structured questionnaires for the 259 participants. Both local leaders and community members were selected using stratified and simple random sampling. Leadership styles and land dispute resolution outcome were assessed using binary logistic regression. The findings indicate that community-based forms of leadership influence land conflict outcomes, particularly informal dialogue (AOR = 23.08, 95% CI: 6.27 - 84.94, $p < 0.001$), negotiation (AOR = 17.68, 95% CI: 3.62 - 86.259, $p < 0.001$), consultation (AOR = 10.30, 95% CI: 3.62 - 29.3, $p < 0.001$), inclusive practices (AOR = 3.13, 95% CI: 1.37 - 7.12, $p = 0.007$), community meetings (AOR = 2.69, 95% CI: 1.17 - 6.19, $p = 0.019$) and awareness sessions (AOR = 19.79, 95% CI: 1.76 - 222.87, $p = 0.016$) that all build trust, cooperation, and lasting peace in conflict situations. In the adjusted model, mediation and legal and administrative processes are not effective predictors, presenting possible limitations to their current implementation of these forms of conflict resolution. Overall, the study illustrates that local leadership is an effective avenue for dispute resolution; however, local actors should now be supported as a reflection of the principle of devolution through financial and technical capacity and national government support for local government actors. In order to strengthen local governance and achieve land justice in rural Tanzania, formal recognition of the customary authorities by the central government is further suggested, along with a more public dispute resolution protocol for investigations of local customary authorities.

Keywords: Land Conflict, Land Dispute Resolution, Local Government, Leadership Strategies

I. INTRODUCTION

Land disputes are becoming a major challenge throughout sub-Saharan Africa, resulting not only in a challenge to the socio-economic well-being of communities but also to the political and institutional stability of states (Bottazzi et al., 2016; Ringo, 2023; Asaaga, 2021). The emergence of land-related conflicts can be attributed to various factors that affect the entire region, such as rising populations and inflating land demands, weak or inadequate land tenure, competing land uses, and ineffective governance (Silva-Novoa Sánchez et al., 2025; Bottazzi et al., 2016; Kombe, 2010; Slesman et al., 2024). Tanzania is not an exception, conflicts between farmers and pastoralists as well as disputes about boundaries and conservation land, have resulted in land degradation, feelings of displacement, and even death. The frequency and increased intensity of land conflicts are emerging as a significant governance issue in districts such as Kiteto, Kilosa, and Ngorongoro (Ringo, 2023; John & Kabote, 2017; Rubakula et al., 2019; Benjaminsen et al., 2009).

Given the rise in land disputes, the government of Tanzania undertook important reforms in its land policy and legal framework to demonstrate recognition of the need for continuity in establishing an inclusive, deconcentrated land administration and conflict resolution system. The 1995 National Land Policy and subsequent enactment of the Land Act (No. 4) and Village Land Act (No. 5) in 1999 were key changes in Tanzania's land governance system. The legislation was aimed at better access to justice in rural areas, but also to streamline statutory and customary land tenure systems through the establishment of the Village Land Councils (VLCs) and Ward and District Land and Housing Tribunals (Massay, 2016; Ringo, 2023; Lugumiliza, 2022). These organs were meant to be accessible, cost-effective, and participatory compared to the formal legal justice system for the adjudication of land disputes in rural, disadvantaged settings in a timely manner (Biddulph & Hillbom, 2020; Rashid, 2021). In these decentralized systems, local government leaders (village chairpersons, ward executive officers, and ward council members) play an essential

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role in the management of a land conflict. These leaders carry both legitimization by virtue of their position and recognition by their constituents, thus making them the first "go to" for disputants to seek mediation, a deliberative dialogue, and a pathway to settle amicably (Lugumiliza, 2022).

Even with the establishment of these decentralized mechanisms, land dispute resolution frameworks have remained uneven and often ineffective, with many of the anticipated reforms struggling to get beyond pilots or facing issues of lack of funds, training, coordination, and enforcement (John & Kabote, 2017). In addition, there is an increasing body of research identifying multiple drivers of continued and escalating land conflicts; these include a rapidly growing population, elite capture and corruption among local leaders, competing land uses, overlapping jurisdiction, and insufficient community participation in land-use planning (Saruni, 2018; Lawuo et al., 2014; Sanga & Moyo, 2018; Ringo, 2023). Local government organizational bodies, such as village and ward leaders, also face challenges in establishing legitimacy, neutrality, and effectiveness when mediating disagreements.

There has been extensive research on land dispute resolution mechanisms at the national or regional level, but there is less understanding of what takes place locally, or how effectively these leaders fulfill that role in practice. Specifically, it is not clear how local government leaders mediate and resolve land disputes. Local studies and empirical studies have paid little attention to this matter. Most of the published studies, such as Slesman et al. (2024), Lawuo et al. (2014), and Rubakula et al. (2019), focus mainly on legal-institutional settings or more general policy reviews at the macro-level, and we have little clear understanding about strategies used by local leaders on land conflict resolution and whether such strategies are effective. Furthermore, most previous studies discussed experiences in general across districts, rather than recognizing the distinct contextual experiences in local settings.

This study seeks to bridge this gap by focusing on Buhigwe District in western Tanzania, a rural area characterized by customary land tenure systems, pressures from cross-border migration, and inadequate institutional capacity to address issues surrounding land. The Buhigwe District also witnessed an increase in land disputes involving individuals, families, and communities. In this context, local government leadership, including village chairpersons, ward executive officers, and other community leaders, are important actors to prevent, mediate, and resolve disputes. However, there is little information about the strategies used and the influence of these strategies on land conflict resolution.

1.1 Research Objectives

i. To determine the leadership strategies employed by local government leaders in resolving land disputes in Buhigwe District.
ii. To determine the influence of leadership strategies in land dispute resolution in Buhigwe District.

II. LITERATURE REVIEW

2.1 Theoretical Review

Transformational Leadership Theory is based on the work of Burns (1978) and Bass (1985), offers an underlying model for analyzing leadership styles in the contexts of governance and conflict resolution. Instead of prioritizing exchanges between leaders and followers, as is the case with transactional leadership, transformational leadership emphasizes leaders' ability to impact, inspire, motivate, and mobilize people towards collective objectives. The theory identifies an overarching framework that consists of four core components: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass & Riggio, 2006). Rather than consider the core components strictly as characteristics of leaders, each component can further be interpreted through these theoretical lenses as intentionally strategic performance benchmarks for leaders to reflect and orient towards a complex governance challenge.

Transformational leadership can provide a specific subset of strategic tools for local government officials to use in managing land disputes and reducing conflict. Land disputes, especially in rural or peri-urban contexts in Tanzania and elsewhere, emerge from entrenched historical, social, and economic tensions. Making sense of effective leadership in these situations implies the leader has gone beyond merely managing the setting and is actually attempting to strategically engage the communities affected by the land dispute. For example, a leader willing to demonstrate idealized influence can utilize trust-building methods of showing transparency, fairness and neutrality in a manner that is meaningful to the parties involved in a land dispute and increases their legitimacy. A leader may also use inspirational motivation strategically to develop a shared vision of a peaceful future for land use and community harmony and develop collective ownership over possible solutions (Ringo, 2023).

Intellectual stimulation allows leaders to question current dispute resolution practices and experiment with new mechanisms such as participatory land mapping or community-based adjudication. This is particularly important in contexts with no or little trust in formal legal systems. In this way, individualized consideration can be expressed through different strategies characterized by dialogue, inclusion, and context-specific solutions, which are all significant aspects of processes associated with sustainable peacebuilding (Ibrahim et al., 2022). Transformational

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leadership theory offers an insightful and theoretical framework that describes how local leaders, through these different strategy applications, can influence processes and outcomes of land conflict resolution.

Moreover, the theory affirms that leadership can, in fact, be a fluid and responsive process that is responsive to the context. Land disputes in Buhigwe District, to take a conflict-sensitive example, might be cognized through ethnic, political, or resource-based identity categories (Deng et al., 2023); therefore, leadership approaches underpinned by transformational principles can more appropriately facilitate reconciliation and the longer-term themes of stability. When leaders activate communities to address grievances while establishing mechanisms for inclusive governance, resolution strategies can promote not only conflict resolution but also social cohesion and development.

2.2 Empirical Review

Empirical literature suggests that leadership strategies are central in navigating land disputes, especially in the presence of legal pluralism, tenure insecurity, and geopolitical fracturing. Ringo (2023) indicates that community involvement, attention to transparency, and facilitating strategic dialogues among stakeholders are key leadership methods for fostering trust, reducing disputant suspicion, and enhancing acceptance of land governance decisions. He points out that in cases where local leaders directly engage stakeholders who are affected, especially subjugated demographic groups such as women and pastoralism-conflict de-escalation is more workable, and representatives of disputing parties are more likely to uphold settlement agreements.

Muhoja and Lyakurwa (2025) concur, asserting that adaptive leadership approaches that embrace legal, customary, and community-based tenures are better able to navigate overlapping claims and historical grievances. His studies suggest that land conflict resolution ought to have an instituted authority, but should have leadership roles that include relational authorities based on empathy, patience, and cultural fluency. Asaaga (2021), working within a West African tenure approach, states that where leaders take the role of facilitators rather than enforcers of state policy, then a greater consensus can be built, especially where traditional norms intersect with formal adjudication methods.

Nevertheless, leadership strategies inherently fail or worsen tensions when they do not accommodate the local context. Tchatchoua- Djomo et al. (2020) point out that in contexts of extensive elite capture, leaders tend to align with powerful actors to undermine both equity and legitimacy. In a similar case, Van Leeuwen et al. (2022) emphasize the limitations of a top-down logic of leaders, illustrated by how formal land interventions do not recognize informal power structures, which, in situations of post-conflict or post-transition, may not resolve disputes or even create disputes.

Sefiw et al. (2025) pursue future directions by investigating leadership's ability to leverage digital innovations related to the participatory mapping and land information systems, among other innovations, as part of their "repertoire of strategies and tools". Their investigation suggests leaders have applied innovation in the digital dimension and increased the strategic contextualising of the technological innovations to map land boundaries and make land tenure claims, whereby the opportunity for antagonism is significantly lessened. This contributes to improved dispute resolution processes, but ultimately bolsters the formal land governance system by reducing ambiguities.

Ruppel and Leib (2022) recommend leadership as primarily working together across institutions on a more systematic basis. They insist that there is a lasting deadlock (or battle) between two or more parties; that these traditional leaders, officials, and judicial officers work in separate (maybe even antagonistic) spaces, thereby sustaining the deadlock (perhaps even overlapping roles or parallel decisions within them). They argue that it is important to establish leadership systems that encourage cooperation, coherence, and trust between institutions. Walwa (2017) adopts a more critical lens, and cautions that land use planning, while often claimed to be a neutral leadership approach, may be manipulated by political elites to accomplish dispossession of vulnerable communities. He implies that if actual community involvement does not happen in these plans, these plans can reflect the interest of powerful groups, instead of resolving conflict, they worsen the conflict as an institution.

Lastly, De Juan (2017) discusses the persistence of pre-colonial and customary dispute resolution practices, and associated them into contemporary leadership methods. He finds that in rural and post-conflict communities, traditional institutions can remain historically significant and visible venues for mediating dispute, as long as they are seen to be legitimate and actionable. However, his focus on issues of historical continuity and local legitimacy applies to how leadership is enacted in present day approaches to leadership.

In considering the nature of leadership within land conflict resolution processes, the research above illuminates the complexity of leadership. With considerations of effective engagement there are not only process questions, there are also relational questions that demand legitimacy of leadership, congruence with local customs, coherence across other actors and institutions, and adaptive and flexible leadership styles. In settings such as the Buhigwe District, where land is central to livelihoods, identity, and local political life, requires beyond inclusion in processes- capable leadership while seeking and achieving sustainable resolutions of land-based conflicts. For leaders to sustainably resolve and manage land conflicts, they have to incorporate technical knowledge, institutional relationships, and inclusive processes.

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III. METHODOLOGY

This study used a cross-sectional research design conducted between March and May 2025 to examine local government leadership strategies in land dispute resolution in Buhigwe District, Tanzania, which was appropriate to capture the complexity of land dispute resolution in a decentralized governance context. A cross-sectional design provided the opportunity to collect data at a single point in time from diverse stakeholders engaged in land governance. The cross-sectional approach made it possible to investigate ongoing leadership strategies, stakeholder interactions, and stakeholder perceptions of dispute resolution mechanisms as they were at the time of the study, without the manipulation of variables or introducing an intervention.

The cross-sectional design was ideal for capturing the complexity of land dispute resolution processes in a decentralized governance context. It provided the opportunity to assess the strategies used by different actors' Village chairpersons, Village Executive Officers (WEO), Vitongoji Chairpersons, and Ward Executive Officers (WEO) at the same time, thus enabling a synoptic assessment. This snapshot approach provided the opportunity to see the leadership strategies used and their influence on land conflict resolutions. The study was carried out in Buhigwe District, in the Kigoma Region of western Tanzania, an area known for a high rate of land disputes involving farmers, pastoralists, and local authorities. Buhigwe's rural nature, limited land resources, and reliance on agriculture is another reason for its appropriateness for this study on local government leadership concerning land governance.

The population of the study involved a total of 290 respondents, consisting of 44 village executive officers, 44 village chairpersons, 20 ward executive officers, and 182 Vitongoji chairpersons who were engaged in land conflicts in Buhigwe District. In this case, the diverse population helped to examine the strategies that leaders use, and how effective these strategies are in resolving land conflicts. The sample size for the study was calculated by using the Kothari (2004) formula, which is illustrated below:

$$n = \frac{Z^2 pqN}{e^2(N-1) + Z^2 pq}$$

Whereas: n: *the sample size for a finite population*

N: *size of population, which is the number of academic employees (290)*

P: *population reliability (or frequency estimated for a sample of size n), where p + q= 1*

e: The *margin of error considered is 2% for this study*

Z α/2: *normal reduced variable at 0.05 level of significance Z: is 1.96*

According to the above formula, the sample size for this study is:

$$n \frac{(1.96)^2 0.02 \times 0.02 \times 290}{(9.04)^2 (290-1) + (1.96)^2 \times 0.02 \times 0.02}$$

n = 259

The proportional distribution of the sample size (n = 259) among the four population groups based on their share of the total population (N = 290), presented in table format:

Table 1

Sample Size Distribution

Group	Population (N)	Sample Size
Village Executive Officers	44	39
Village Chairpersons	44	39
Ward Executive Officers	20	18
Vitongoji Chairpersons	182	163
Total	**290**	**259**

This study used a combination of stratified sampling and simple random sampling methods to achieve a representative and balanced selection of the respondents at all administrative levels and leadership functions concerning land dispute resolution in Buhigwe District. The use of stratified sampling allowed the researcher to place the population into four distinct strata based on respondents' positions (WEO, VEO, Vitongoji chairpersons and Village chairpersons). It was necessary to employ stratified sampling to ensure that the sampling selection would have adequate representation for each category of leadership that represented different levels of authority and responsibility in the land governance system. Stratification of the sampling was warranted because of the varying functions played by the selected groups involved in the process of dispute resolution. For example, the VEOs and WEOs serve as administrative officers while the Chairpersons (at the village and vitongoji level) are elected representatives who directly interact with local members of the community. As such, stratifying the sampling method was

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important to capture the understanding of groups with governance responsibilities. Within each stratum, a simple random sampling method was utilized to select individual respondents. This approach was utilized to remove selection bias to ensure that each member of the sample stratum had an equal probability of being included in the sampling. A random number generator was utilized to draw names from official lists provided by the Buhigwe District Council. This enhanced the internal validity of the results through the minimization of systematic exclusion or overrepresentation of specific individuals or subgroups. The sampling protocol also aimed to achieve a well-above-average sampling ratio to enhance the credibility of the findings.

A questionnaire was the main data collection tool used in this study to collect data from local government leaders who were part of the land dispute resolution process in Buhigwe District. The use of a questionnaire was methodologically justified based on the need to systematically collect standardized data from a relatively large and geographically dispersed group of respondents (n=259), namely Village Executive Officers, Village Chairpersons, Ward Executive Officers, and Vitongoji Chairpersons.

The questionnaire was an appropriate data collection method for this study for at least three reasons. To begin with, it allowed the researcher to easily collect quantitative data from a relatively large number of respondents in a short time frame, consistent with the research's cross-sectional design. Second, the questionnaire generated consistency in terms of the respondents' experiences, since all of the participants would be asked the same form of questions, which is important to the reliability of their answers and comparisons across administrative levels and roles. Considering that the participants had a variety of educational and managerial backgrounds, the questionnaire was structured to be clear, concise, and relevant to the context, with closed-ended questions. Closed-ended questions provided structured responses that could later be quantitatively tested to highlight the patterns and trends of leadership strategies, coordination practices, and perceived effectiveness of dispute resolution processes. To establish validity and reliability, the questionnaire was pre-tested with a small group of respondents (n=10) that was not part of the sample for this study, and changes were incorporated based on the feedback given to improve clarity, remove ambiguity, and align the instrument with the objectives of the study.

Prior to analysis, the collected data underwent a series of coding and cleaning to ensure accuracy and consistency. This included checks for missing values, outliers, and any inconsistencies in the responses. Once cleaned, the data were analyzed using statistical software. The first step to analyze the data was utilizing descriptive statistics to summarize and describe the different leadership strategies used by local leaders in land conflict resolution and to describe the challenges local leaders faced in resolving land conflicts. Frequencies and percentages were calculated to describe the prevalence and distribution of respondents' leadership strategies, including negotiation, mediation, community meetings, and inclusive approaches; this was also to give the reader a clear understanding of the practices that have been adopted to resolve land disputes. Data analysis in this study included bivariate and multivariate logistic regression to explore the nature of the relationships between leadership strategies and land conflict resolution outcomes thoroughly. At the outset, bivariate analysis was conducted to explore the association between each independent variable (i.e. community meetings, mediation, negotiation, and awareness sessions) and the dependent variable, which was the effectiveness of land dispute resolution.

This analysis also identified which leadership strategies were significantly associated with conflict resolution outcomes. Then, to address the joint influence of multiple leadership approaches when examining land conflicts the research utilized multivariate analysis (binary logistic regression), adjusting for possible confounding variables. This approach generated adjusted odds ratios, which revealed the relevance and significance of each approach when examined concurrently. Thus, using both bivariate and multivariate analysis, the study conveyed a strong representation of how leadership approaches do not function independently, and thus, provide depth and quality to the research findings. This research adhered to rigorous ethical considerations to protect and respect all participants throughout the research study. Informed consent was obtained before data collection from each respondent, who received information regarding the study's purpose, procedures involved, and their ability to withdraw at any time without consequence. Confidentiality and anonymity were observed through the allocation of codes to participants, instead of their personal identifiers, and we took measures to secure data (usage of password-protected devices) to avoid unauthorized access. Participation was strictly voluntary and not coerced or influenced inappropriately. The study also respected cultural sensitivities and local customs, especially when the possible subject matter of the study involved a sensitive discussion around land disputes. Ethical clearance was requested and granted by Buhigwe district council. As a whole, these factors maintain that this research was conducted responsibly to respect participants' rights and allow for the trustworthiness of the research findings.

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics of Respondents

The demographic information of the participants indicates a very diverse and representative sample from the Buhigwe District community, which is relevant for a land conflict study. Female respondents make up the most represented demographic at 62.8%, which perhaps illustrates their predominance in leadership and land matters. Individuals of varied ages were present, which is to be expected of a study obtaining a wide range of ages, spanning young adults (18-24) through to older members of the community (55+ years). The age distribution further illustrates the impact of land issues across the whole age spectrum. The greatest representation of people was obtained from participants who were married (64%), which is significant regarding communal household and kin structure in relation to land conflict. Respondents were also well educated, including a significant proportion who received secondary (40.7%) and tertiary education (27.1%). Educated individuals may illustrate a greater capacity for involvement in conflict resolution. Farming proved to be the most common activity (33.3%) which is indicative of the importance of land as a source of livelihood in this rural context.

In addition, the individuals in the study differed by how long they had lived in Buhigwe: less than five years, and greater than twenty years, which displayed a veteran community member as well as newcomers and all caucus perceptions of property

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and legitimacy. Especially important, not one of the individuals in the study claimed never having been in a land dispute, either as a disputant, mediated, or a bystander, which underscored the presence of land disputes in the community. The broad range of respondents' experiences would help the data analysis in showing the possibilities of a range of local leaders' strategies and how the model could be successful in land disputes while emphasizing either of the local context and inclusive process as a technique of dispute strategies.

Table 2

Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Valid Percent (%)
Gender	Male	162	62.8
	Female	96	37.2
Age Group	18–24	56	21.7
	25–34	49	19.0
	35–44	52	20.2
	45–54	43	16.7
	55+	58	22.5
Marital Status	Single	29	11.2
	Married	165	64.0
	Divorced	26	10.1
	Widowed	38	14.7
Education Level	No Formal Education	60	23.3
	Primary	23	8.9
	Secondary	105	40.7
	Tertiary	70	27.1
Occupation	Business	73	28.3
	Farming	86	33.3
	Employed	52	20.2
	Unemployed	36	14.0
	Other	11	4.3
Years of Residency	<5 Years	50	19.4
	5–10 Years	94	36.4
	11–20 Years	71	27.5
	>20 Years (4)	43	16.7
Have you ever been involved in a land dispute?	Yes (1)	258	100.0
If yes, what was your role?	Disputant	79	30.6
	Mediator	93	36.0
	Witness	86	33.3

4.2 Leadership Strategies Employed by Local Government Officials in Resolving Land Disputes

The study examines the impact of leadership strategies employed by local authorities in resolving land conflicts in the Buhigwe Kigoma region. Through descriptive statistics, respondents evaluated the leadership strategies by answering yes or no to a series of questions. Results are detailed in Table 3. The study examined the leadership strategies used on land conflict resolution in the Buhigwe Kigoma region, based on responses from 259 participants. Key findings indicate that a majority (66.4%) of respondents viewed community meetings as ineffective for land conflict resolution. However, negotiation and community mediation were favoured by 77.2% and 96.7% of respondents, respectively. Overall, 68.7% supported community engagement as a strategy, suggesting local leaders utilize it to address land conflict in the region.

Additionally, questions were asked regarding the utilization of legal and administrative strategies as a means to resolve land conflicts. The findings suggest that among 259 respondents, 159 individuals responded "no" to using legal and administrative procedures, equating to almost 61.4% of respondents, compared to 100 (38.6%) that did agree. These results imply that several respondents did not seem to highly value legal and administrative processes as a strategy for land conflict resolution. The follow-up question asked whether informal dialogue was also a strategy of conflict resolution regarding their land conflict. With regard to informal strategies, 180 (69.5%) of respondents agreed with the strategy amongst the yes respondents, and 79 (30.5%) said no in relation to the disagreeing participants. The data shows this in Table 4.2. When discussing inclusivity types of strategies to land conflict resolution, as indicated in the results, 253 (97.7%) agreed that this is a method in which all parties involved with the land conflict are invited to participate in the conflict resolution approach (see Table 3).

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Table 3

Leadership Strategies Employed by Local Government Leaders

Variable	1=Yes	0 = No	Mean	Std. Dev.
Community Meeting	87 (33.6%)	172 (66.4%)	0.66	0.473
Consultation	81 (31.3%)	178 (68.7%)	0.69	0.465
Mediation	197 (76.1%)	62 (23.9%)	0.24	0.428
Negotiation	200 (77.2%)	59 (22.8%)	0.23	0.420
Awareness sessions	251 (96.9%)	8 (3.1%)	0.03	0.173
Inclusive approaches	253 (97.7%)	6 (2.3%)	0.02	0.151
Legal and administrative procedures	159 (61.4%)	100 (38.6%)	0.39	0.488
Informal dialogue	180 (69.5%)	79 (30.5%)	0.31	0.461

4.3 Logistic Regression Model fit Statistics

The results of the logistic regression model fit statistics are presented in Table 4. The Omnibus Test of Model Coefficients generated a chi-square value of 183.453 with degrees of freedom (df) 8, yielding significance $p < .001$. This indicates that the predictors in the model predicted as a set significantly better than the base (or null) model and that the independent variables together explained variance in the dependent variable. Additionally, the Hosmer and Lemeshow Test for evaluation of goodness-of-fit assessment resulted in a chi-square value of 13.414 and df 7 at significance $p = .063$. Since the p-value is greater than the conventional cut-off of $p < 0.05$, the null hypothesis cannot be rejected. The null hypothesis states that there is no difference between observed values and predicted values. Thus, this further indicates that the model fits the data well and does not exhibit poor specification. The -2 Log Likelihood score of 173.181 is lower than expected, meaning a better-fitting model, which is helpful in this research, as the smaller numbers signify a model that fits the outcome variable better. The Cox & Snell R^2 of 0.508 and the Nagelkerke R^2 of 0.679 suggest the model has explained 50.8%-67.9% of the dependent variable's variance. The model vs unadjusted R^2 (the Nagelkerke R^2) shows strong explanatory power associated with the model in terms of social science.

Table 4

Logistic Regression Model Fit Statistics

Test Component	Statistic / Value	df	Sig.	Interpretation
Omnibus Test of Model Coefficients	$\chi^2 = 183.453$	8	.000	Model significantly improves fit over null model
Hosmer and Lemeshow Test	$\chi^2 = 13.414$	7	.063	Indicates good fit ($p > 0.05$)
-2 Log Likelihood	173.181			Lower values suggest better model fit
Cox & Snell R^2	0.508			Indicates moderate explanatory power
Nagelkerke R^2	0.679			Indicates strong model performance
Estimation Iterations	Converged at iteration 6			Parameter estimates changed by < 0.001

4.4 The Influence of Leadership Strategies on Land Conflict Resolution

This study examined the role of leadership by local government officials in resolving land disputes in Buhigwe district, Tanzania. Among the range of leadership strategies examined, informal dialogue was found to influence land dispute resolution the most. In the bivariate analysis, the use of informal dialogue by local leaders was about 43.758 times more likely to influence land dispute resolution (OR, 43.758, CI 13.274-144.248, $p = 0.000$). In the multivariable model, the use of informal dialogue was about 23.084 times more likely to influence land dispute resolution (OR, 23.084, 6.273-84.938, $p = 0.000$), controlling for other leadership interventions, including Community meetings, consultations, awareness sessions, legal and administrative categories, and negotiation.

Negotiation was found to be the second most influential leadership strategy in land dispute resolution among the interventions analyzed. In the multivariable analysis, the use of community negotiation by local leaders was about 17.7 times more likely to influence land dispute resolution (OR, 17.684, CI 3.625-86.256, $p = 0.000$), controlling for community meetings, consultations, awareness sessions, informal dialogue, as well as other leadership strategies. The use of community negotiation significantly influenced land dispute resolution, and the bivariate model found that local leaders who used community negotiation were about 24.7 times more likely to influence land dispute resolution (OR, 24.744, CI 7.492-81.724, $p = 0.000$). Overall, of all the conflict resolution interventions assessed, negotiation had the most significant effect on increasing the probability of achieving the intended outcome.

Three leadership strategies, including awareness sessions (OR, 2.537, CI 0.502-12.811, $p = 0.016$), consultations (OR, 6.645, CI 3.662 – 12.058, $p = 0.000$), and community meetings (OR, 2.275, CI 1.345 -3.849, $p = 0.019$), were statistically significant and, therefore, considered to be associated with land conflict resolution. However, other leadership strategies, specifically Legal and administrative procedure (OR, 1.667, CI 0.300 - 9.264, $p = 0.459$)

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and Mediation (OR, 8.361, CI 3.780 - 18.493, p = 0.120) were statistically insignificant factors associated with land conflict resolution as shown by both bivariate and multivariate analysis.

Table 4

The Influence of Leadership Strategies on Land Conflict Resolution

Variable	Unadjusted OR	95% CI (Unadj.)	p-value (Unadj.)	Adjusted OR	95% CI (Adj.)	p-value (Adj.)
Community Meeting	2.275	1.345 – 3.849	0.002	2.694	1.173 – 6.187	0.019
Consultation	6.645	3.662 – 12.058	0.000	10.304	3.623 – 29.307	0.000
Mediation	8.361	3.780 – 18.493	0.000	2.506	0.788 – 7.973	0.120
Negotiation	24.744	7.492 – 81.724	0.000	17.684	3.625 – 86.256	0.000
Awareness sessions	2.537	0.502 – 12.811	0.260	19.787	1.757 – 222.868	0.016
Legal and administrative procedures	1.667	0.300 – 9.264	0.559	2.814	0.182 – 43.539	0.459
Inclusive approaches	6.258	3.488 – 11.228	0.000	3.126	1.373 – 7.119	0.007
Informal dialogue	43.758	13.274 – 144.248	0.000	23.084	6.273 – 84.938	0.000

The regression results confirm that leadership strategies influence land conflict resolution in Tanzania. Leadership strategies with the highest statistical significant with the highest likelihood of an outcome is consultation, with an adjusted odd ratio (AOR) of 10.304 (95% CI: 3.623–29.307, p = 0.000), meaning that if consultation is pursued, there is a much greater chance that land conflict will be resolved. This corroborates findings from Ibrahim et al. (2022) that trust in local actors increased and legitimacy was provided to existing resolution mechanisms because of more consultative participation.

In like manner, informal dialogue had the strongest effect, with an adjusted odd ratio (AOR) of 23.084 (p = 0.000). This highlights the significance of culturally-contextualised, everyday forms of communication, consensus, and conflict resolution. This is especially true for rural locations where access to a formal legal institution is problematic, seen as untrustworthy, or not adopted by the local populace. Informal dialogue is based on social norms and acknowledges the traditions that empower different members of the community to participate, and are viewed by community members as legitimate and trustworthy. As a result, informal dialogue may serve as a basis for customary justice that operates parallel, or as a substitute, to legal regimes across the globe. Informal approaches contribute to mutual understanding and peaceful coexistence among people living in regions of land disputes and natural protected areas (Muhoja & Lyakurwa, 2025b)

Negotiation was also an underlined theme with a statistically significant association (p = 0.000), with an adjusted odd ratio (AOR) of 17.684, further supporting Ringo's (2023) idea that negotiation is a frontline strategy used by village land councils to manage conflicts before they escalate. Mediation had a very strong statistically significant association in the unadjusted analysis (OR = 8.361, p = 0.000), although it was not statically significant in the adjusted analysis (AOR = 2.506, p = 0.120). This may suggest that although mediation is inherently normal, context matters, or the extent to which mediation was possible was contingent on other intervening variables, such as power or trust in the institutions (Tchatchoua-Djomo et al., 2020)

Public awareness sessions, in contrast to the other themes, had a low unadjusted association (OR = 0.282, p = 0.071) but was also statistically significant in the adjusted analysis (AOR = 19.787, p = 0.016), indicating that, controlling for other variables, public awareness issues were an important contributor to resolving issues around land rights in local contexts. Additionally, there were no statistically significant relationships found for the themes of legal approaches or administrative processes (AOR = 2.814, p = 0.459). This supports Walwa (2017) assertion that while legal approaches are important, they do not produce results that are timely, or just by virtue of their legal status related to reality on the ground, particularly with contested claims across land tenure regimes, or where dispossession is non-equitable.

Moreover, the inclusive approaches revealed a statistically significant positive result (AOR=3.126, p=0.007), which indicates worth for working with the parties to the dispute. This is supported by the work of Rubakula et al. (2019) in their study of inclusive action in Kigoma that sought to demonstrate legitimacy and compliance through customary practice, as well as working with communities. Community meetings as a theme being statistically

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significant (AOR=2.694, p=0.019) further supports Muhoja & Lyakurwa, (2025) position that these are also a way to diffuse tensions, which creates an opportunity to engage, although they were valued less than the inclusive approaches.

Therefore, the evidence presented suggests that place-based, participatory, and dialogue-based responses are not only culturally relevant but statistically effective means of addressing land disputes. It underscores the necessity for improvement via informal, inclusive approaches, at the same time; the formal law continues to evolve. The evidence presented also encourages researchers and practitioners to rethink tradition by intentionally shifting their land governance approach from a dominant bureaucratic or top-down land tenure system to methods that are community-centered based on trust, equity, and access, emphasized by van Zeng et al. (2024) and Bottazzi et al. (2016).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This article presents a locally-grounded approach to the leadership strategies for land dispute resolution in rural contexts. The strategies highlighted within this article showed that informal discussions emerged as the most effective strategy used: affirming the significance of culturally-grounded approaches for dispute resolution. Negotiation and consultation strategies were also effective, underscoring the importance of process and participation in local settings. Conversely, formal processes related to law and administration were less effective, revealing that institutional processes had low accessibility, responsiveness, and legitimacy in aiding land dispute resolution in this context. Community ownership-oriented strategies, which include inclusive strategies, community meetings, and awareness building, were also effective in land dispute resolution and are indicative of the necessity of socially legitimate processes that are contextually appropriate and acceptable. Collectively, these findings demonstrate an obligation for public administrators and development practitioners to recognize, adopt and promote indigenous and informal processes in larger land governance structures. Both adopting and recognizing locally-based processes not only enhance efforts to resolve disputes, but build local ownership, trust and ultimately social cohesion for the long term.

5.2 Recommendation

The findings of this study suggest that approaches based on informal and community-based processes need to be more explicitly included in formal land governance and conflict resolution systems. Public administrators and development practitioners need to sunder as an objective to inform and transform the locally validated elements of informal dialogue, consultation and negotiation by recognizing its legitimacy and facilitating institutionalization. Attention needs to be placed on integrating informal responses with broader governance arrangements to ensure informal approaches are complementary rather than in competition to the existing formal legal regime. In addition, efforts to support facilitation and community based leadership at the local level need to incorporate informal and community-based processes taking into account the social and cultural characteristics of the community. Building trust through transparency, accountability and culturally-appropriate protocols is important as is embedding all interventions into the local historical and social textile of land relations. Finally, the potential for strategies to be effective and sustainable can be strengthened through increasing community capacity through legal literacy and civic education to raise awareness.

REFERENCES

Asaaga, F. A. (2021). Building on “traditional” land dispute resolution mechanisms in rural Ghana: Adaptive or anachronistic? *Land*, 10(2), 143. https://doi.org/10.3390/land10020143

Bass, B. M. (1985). *Leadership and performance*. Free Press.

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Psychology Press. https://doi.org/10.4324/9781410617095

Benjaminsen, T. A., Maganga, F. P., & Abdallah, J. M. (2009). The Kilosa killings: Political ecology of a farmer–herder conflict in Tanzania. *Development and Change*, 40(3), 423–445. https://doi.org/10.1111/j.1467-7660.2009.01558.x

Biddulph, R., & Hillbom, E. (2020). Registration of private interests in land in a community lands policy setting: An exploratory study in Meru district, Tanzania. *Land Use Policy*, 99, 104830. https://doi.org/10.1016/j.landusepol.2020.104830

Bottazzi, P., Goguen, A., & Rist, S. (2016). Conflicts of customary land tenure in rural Africa: Is large-scale land acquisition a driver of ‘institutional innovation’? *The Journal of Peasant Studies*, 43(5), 971–988. https://doi.org/10.1080/03066150.2015.1119119

Licensed Under Creative Commons Attribution (CC BY-NC)

Burns, J. M. (1978). *Leadership*. Harper & Row. https://www.jstor.org/stable/40862298

De Juan, A. (2017). "Traditional" resolution of land conflicts: The survival of precolonial dispute settlement in Burundi. *Comparative Political Studies*, 50(13), 1835–1868. https://doi.org/10.1177/0010414016688006

Deng, C., Gulseren, D., Isola, C., Grocutt, K., & Turner, N. (2023). Transformational leadership effectiveness: An evidence-based primer. *Human Resource Development International*, 26(5), 627–641. https://doi.org/10.1080/13678868.2022.2135938

Ibrahim, A.-S., Abubakari, M., Akanbang, B. A. A., & Kepe, T. (2022). Resolving land conflicts through alternative dispute resolution: Exploring the motivations and challenges in Ghana. *Land Use Policy*, 120, 106272. https://doi.org/10.1016/j.landusepol.2022.106272

John, P., & Kabote, S. (2017). Land governance and conflict management in Tanzania: Institutional capacity and policy-legal framework challenges. *American Journal of Rural Development*, 5(2), 46–54. https://doi.org/10.12691/ajrd-5-2-3

Kombe, W. J. (2010). Land acquisition for public use, emerging conflicts and their socio-political implications. *International Journal of Urban Sustainable Development*, 2(1–2), 45–63. https://doi.org/10.1080/19463138.2010.520919

Kothari, C. R. (2004). *Research methodology: Methods & techniques* (2nd rev. ed.). New Age International (P) Ltd.

Lawuo, Z. A., Mbasa, B., & Mnyawi, S. P. (2014). Persistence of land conflicts between Maasai community and Ngorongoro Conservation Area Authority (NCAA) in Ngorongoro Conservation Area (NCA). *International Journal of Innovation and Scientific Research*, 5(2), 154–161. http://www.ijisr.issr-journals.org/abstract.php?article=IJISR-14-142-01

Lugumiliza, P. S. (2022). The effectiveness of village councils in land conflicts management in Tanzania: A reflection of Kondoa District Council. *Tanzania Journal of Community Development*, 2(2), 18–29. https://www.ajol.info/index.php/tajocode/article/view/289896

Massay, G. (2016). Tanzania's Village Land Act 15 years on. *International Journal of Rural Development*, 50(3), 18–19.

Muhoja, M. S., & Lyakurwa, R. (2025). From conflict to cohesion: Community-based grievance redress in informal settlements regularization projects in emerging urban centers in Tanzania. *Cogent Social Sciences*, 11(1), 2540421. https://doi.org/10.1080/23311886.2025.2540421

Rashid, F. N. (2021). Achieving SDGs in Tanzania: Is there a nexus between land tenure security, agricultural credits, and rice productivity? *Resources, Conservation and Recycling*, 164, 105216. https://doi.org/10.1016/j.resconrec.2020.105216

Ringo, J. (2023). Roles of village land councils in mitigation of land conflicts in Ngorongoro district, Tanzania. *Heliyon*, 9(4), e15132. https://doi.org/10.1016/j.heliyon.2023.e15132

Rubakula, G., Wang, Z., & Wei, C. (2019). Land conflict management through the implementation of the national land policy in Tanzania: Evidence from Kigoma Region. *Sustainability*, 11(22), 6315. https://doi.org/10.3390/su11226315

Ruppel, S., & Leib, J. (2022). Same but different: The role of local leaders in the peace processes in Liberia and Sierra Leone. *Peacebuilding*, 10(4), 470–505. https://doi.org/10.1080/21647259.2022.2027152

Sanga, S. A., & Moyo, K. J. (2018). Women, awareness, and land conflicts: Evidence from Makete, Tanzania. *African Journal on Land Policy and Geospatial Sciences*, 1(1), 33–50. https://doi.org/10.48346/IMIST.PRSM/ajlp-gs.v1i1.12405

Saruni, P. L. O. (2018). Post-conflict coping strategies and well-being of farmers and pastoralists in Kilosa and Kiteto districts, Tanzania [PhD thesis, Sokoine University of Agriculture]. SUA Institutional Repository. https://www.suaire.sua.ac.tz/handle/123456789/2969

Sefiw, N., Alemayehu, A., & Kebede, B. (2025). Conflict in land acquisition for cooperative housing development in Woldia, Ethiopia. *Land Use Policy*, 154, 107575. https://doi.org/10.1016/j.landusepol.2025.107575

Silva-Novoa Sánchez, L. M., Schilling, J., Bossenbroek, L., Ezzayyat, R., & Berger, E. (2025). Drivers of conflict over customary land in the Middle Drâa Valley of Morocco. *World Development*, 188, 106872. https://doi.org/10.1016/j.worlddev.2024.106872

Slesman, L., Kole, A., Abdlaziz, R. A., & Raheem, I. D. (2024). Taming the tides of internal conflicts in Sub-Saharan Africa: The role of political institutions and natural resources. *Global Journal of Emerging Market Economies*, 16(2), 188–211. https://doi.org/10.1177/09749101231187468

Tchatchoua-Djomo, R., Van Leeuwen, M., & Van der Haar, G. (2020). Defusing land disputes? The politics of land certification and dispute resolution in Burundi. *Development and Change*, 51(6), 1454–1480. https://doi.org/10.1111/dech.12621

Van Leeuwen, M., Mathys, G., De Vries, L., & Van der Haar, G. (2022). From resolving land disputes to agrarian justice – Dealing with the structural crisis of plantation agriculture in eastern DR Congo. *The Journal of Peasant Studies*, 49(2), 309–334. https://doi.org/10.1080/03066150.2020.1824179

Licensed Under Creative Commons Attribution (CC BY-NC)

Walwa, W. (2017a). Land use plans in Tanzania: Repertoires of domination or solutions to rising farmer–herder conflicts? *Journal of Eastern African Studies*, 11(3), 408–424. https://doi.org/10.1080/17531055.2017.1359878

Walwa, W. (2017b). Land use plans in Tanzania: Repertoires of domination or solutions to rising farmer–herder conflicts? *Journal of Eastern African Studies*, 11(3), 408–424. https://doi.org/10.1080/17531055.2017.1359878

Zeng, H., Zhou, Z., Li, W., Li, L., Tang, R., Xiong, S., Gong, D., Huang, Y., Bai, L., & Deng, Y. (2024). Revealing the synergistic effect between radical and non-radical species of sulfur-doped carbon nitride for ciprofloxacin removal: Based on density functional theory study. *Science of The Total Environment*, 915, 170191. https://doi.org/10.1016/j.scitotenv.2024.170191

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Knowledge management practices and innovation in commercial banks in Kenya

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ABSTRACT

The increasingly competitive environment has made organizations realize that knowledge is a key asset in enhancing innovation that is critical in achieving customer satisfaction and competitive advantage. This study sought to examine the effect of knowledge management practices on innovation in commercial banks in Kenya. Knowledge-based view theory guided the study. Explanatory research design and cross-sectional survey research design were adopted. The study employed a census survey of all 38 commercial banks in Kenya. Data was collected using a structured questionnaire. Descriptive statistics such as means and standard deviations were used to summarize the data. Pearson's correlation was used to examine the relationship between knowledge management practices and innovation. To test the research hypothesis, multiple regression analysis was used. The results revealed that commercial banks in Kenya practice knowledge management, as indicated by high mean scores for knowledge generation (mean = 4.28), knowledge sharing (mean = 4.34), knowledge storage (mean = 4.41), and knowledge application (mean = 4.49). The banks also practice innovation (mean = 4.31). Correlation analysis revealed positive and significant relationships between all aspects of knowledge management and innovation, with the strongest correlations observed for knowledge generation ($r = 0.616$, $p < 0.05$) and knowledge application ($r = 0.602$, $p < 0.05$). These results suggest that effective knowledge management is closely linked to innovation in Kenyan commercial banks. Regression analysis showed that all the knowledge management practices, namely knowledge generation ($\beta = 0.353$, $p < 0.05$), knowledge sharing ($\beta = 0.112$, $p < 0.05$), knowledge storage ($\beta = 0.095$, $p < 0.05$), and knowledge application ($\beta = 0.300$, $p < 0.05$), have a positive effect on innovation. Further, the ANOVA indicated that the effect of knowledge management practices on innovation is significant ($F = 4.953$, $p < 0.05$). This suggests that effective management of knowledge enhances the ability of banks to innovate. The study recommends that organizations ought to embrace effective knowledge management practices to enhance innovation and competitive advantage.

Keywords: Commercial Banks, Innovation, Kenya, Knowledge Management Practices

I. INTRODUCTION

The business environment in which firms are currently operating in is characterized as volatile, uncertain, complex and ambiguous. Consequently, firms are supposed to innovate and improve their performance continuously in order to catch up with the market changes and be at par with the competitors (Brix, 2017). Organizations have realized that knowledge is the only asset they have to enable them to cope with the ever-dynamic business environment (Mutuku, 2014). Literature suggests that knowledge management practices influence innovation which in turn enhances customer satisfaction and firm competitiveness (Kiptalam et al., 2016). Innovation involves the discovery, experimentation, and development of new technologies, new products and/or services, new production processes, and new organizational structures. Innovation is about implementing new ideas. Innovation involves product, process, marketing and organizational innovations (Ganzer et al., 2017).

Product innovation is the most common form of innovation which refers to improvements in performance characteristics and attributes of the product (Wilson & Campbell, 2016). Product innovation implies changes in a product provided by the organization by using new or existing technologies. It also refers to the development and marketing of new products related to customer satisfaction (Sofiyabadi et al., 2020). Process innovation comprises of changes in the way in which new or improved products are created and delivered. It is the development of different ways of manufacturing and providing services (Soi, 2016). Process innovation is centered on improving the efficiency and effectiveness of the production process. Significant changes in techniques and equipment are part of process innovation, which intends to reduce production or distribution costs in order to improve the quality and distribution of products. Marketing innovation involves implementing new marketing methods to improve product design, packaging, placement, promotion, or pricing. It is about finding new ways to address customer needs, open new markets, or reposition a product in a way that increases sales (Ode & Ayavoo, 2020). Organizational innovation refers to the implementation of new organizational methods within a company, impacting business practices, workplace

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organization, or external relations (Tavassoli & Karlsson, 2016). These can be organizational process innovations or product innovations, for instance new tools for measuring customer satisfaction or optimizing delivery processes to reduce costs (Muthami et al., 2016; Nam et al., 2017).

Knowledge can be defined as an evolving mix of framed experience, values, contextual information and expert insight that provide a framework for evaluating and incorporating new experiences and information (Brix, 2017). Knowledge management involves capturing an organization's know-how and know-what through creation, collection, storage, distribution, and application of information (Ongus et al., 2016). It thus means identifying and harnessing the collective knowledge of the organization gained through experience and competencies. Wilson and Campbell (2016) defined knowledge management as a systematic, organized, explicit and deliberate ongoing process of creating, disseminating, renewing, applying and updating the knowledge in order to realize the set objectives.

Knowledge generation is the process involving creating internal knowledge, and acquiring external knowledge (Brix, 2017). Firms with high innovation potential employ benchmarking to identify gaps and problems, and disseminate information for best practices for internal use, to effectively make change decisions (Ongus et al., 2016). Knowledge sharing, sometimes interchangeably referred to as knowledge transfer or dissemination, is the process of exchanging knowledge from a knowledge source to a knowledge recipient.

Knowledge storage is the process of recording knowledge and storing it in the repositories such as databases, archives and filing systems. Organizations that generate knowledge and learn, forget the newly developed knowledge or lose track of the generated knowledge hence, it is crucial to store, organize, refine, and make retrievable this organizational knowledge as part of an effective knowledge management system (Wawira, 2013).

Knowledge application is the process where the knowledge is turned into effective action. The use of knowledge ensures companies and individuals develop their core competencies. Mwihia (2008) argued that effective application of knowledge will help organizations to improve their efficiency and reduce costs, and organizations can achieve competitive advantage if they locate and apply the right kind of knowledge in the right form.

In Kenya, the banking sector comprises the Central Bank of Kenya, commercial banks, non-bank financial institutions, deposit-taking microfinances and forex bureaus, both locally and foreign owned. Performance in the banking industry is affected by a number of environmental factors both micro and macro, and they significantly influence business strategies in the industry. Commercial banks need to develop strategies such as innovation that will enable them to grow and survive in the competitive environment (Central Bank of Kenya, 2024). One key way of ensuring this is by adopting effective knowledge management practices. Commercial banks are expected to manage knowledge as a resource to enhance innovation and improve performance. In search for competitiveness, banks have embraced innovations such as agent banking, which enables them to offer services to their customers by engaging the services of third party outlets.

1.1 Statement of the Problem

In the rapidly changing and competitive nature of the business environment, innovation has become one of the most important elements for survival. Firms are increasingly adopting innovation to enhance customer satisfaction and overall performance in the competitive environment. Effective knowledge management practices are crucial in generating new insights to enhance innovation, customer satisfaction and performance (Mardani et al., 2018; Simanaviciene et al., 2021). Literature suggests that one of the key drivers of innovation is knowledge, hence the need to adopt appropriate knowledge management practices that enhance innovation.

Competition in the Kenyan banking industry is stiff and the industry is highly changing with the passing of time (Central Bank of Kenya, 2024). Banks must find a way of surviving and succeeding in the competitive environment through appropriate knowledge management practices to enhance innovation by developing new products, new processes, and new markets for products as well as synchronizing organizational structures.

Various studies have been conducted to examine the influence of knowledge management practices on innovation (Abdi et al., 2018; Bawa et al., 2023; Cristache et al., 2025; Garcia-Piqueres et al., 2019; Mardani, et al., 2018; Mutinda, 2017; Kiptalam et al., 2016; Simanaviciene at al., 2021; Thang & Tuan, 2020). However, these studies have largely adopted a limited conceptualization of knowledge management practices in terms of knowledge acquisition and dissemination. The studies have given scanty attention on the aspects of knowledge storage and knowledge application. Further, these prior studies have not examined the collective effect of all aspects of knowledge management practices on innovation in a single study. Thus, this study adopted an integrative perspective to examine the effect of knowledge management practices on innovation in commercial banks in Kenya.

1.2 Research Objective

The objective of this study was to establish the effect of knowledge management practices on innovation in commercial banks in Kenya.

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1.3 Research Hypothesis

H_1: Knowledge management practices have a positive effect on innovation.

II. LITERATURE REVIEW

2.1 Theoretical Review

In this study, knowledge-based view theory (KBV) was used as the theorectical background. KBV is an extension of the resource-based view theory of the firm that considers knowledge as the most important strategic resource of the firm for competitiveness (Fu, 2022). This theory presents that the major determinants of sustained competitive advantage and superior performance are knowledge-based resources that are socially complex and difficult to imitate (Leal-rodríguez et al., 2013). The theory proposes that an enterprise should act as intelligently as possible to secure its capability through effective knowledge management practices and position the firm for long-term success through innovation.

According to KBV, knowledge is one of the special strategic resources that does not lose value in the way traditional economic productive factors do. Most knowledge-based resources are mainly intangible and dynamic, thus allowing for idiosyncratic development through path dependency and causal ambiguity (Silvia & Rajshekhar, 2019). KBV argues that knowledge is the key resource in new value creation, heterogeneity and competitive advantage. Knowledge-based resources are difficult to imitate, transmit and have social complexities hence making an organization achieve sustainable knowledge-based competitive edge.

The essence of knowledge management regarding innovation is that it delivers a framework for organizations in their endeavour to develop and improve their capability to innovate. If knowledge management as an intangible asset is implemented effectively in different levels of the organization, it leads to some unique capabilities and capacities which in turn lead to superior performance through innovation (Kull & Mena, 2016).

In the current study, the knowledge-based view is adopted in appreciating the value of knowledge in contributing to innovation which will in turn lead to firm competitiveness. The theory creates understanding of how applying knowledge management in innovation can significantly enable an organization to enhance its performance, achieve strategic goals and hence create competitive advantage in the information era (Olayinka & Nkemdilim, 2018).

2.2 Empirical Review

Knowledge is deemed to be a strategic resource; and the capability of organizations to generate, share, store and apply it can be used to achieve innovation that will in turn lead to competitive advantage and superior performance. Rahimi et al. (2018) argue that effective knowledge management will lead to innovation, and organizations that quickly capture and implement new knowledge are able to foster innovation compared to those that do not focus on knowledge management. Similary, Ngoc-tan and Gregar (2018) contended that knowledge management has an influence on innovation in academic settings and with innovation, an organization is able to enhance performance by engaging in knowledge management activities.

Various studies have examined the relationship between knowledge management and innovation. Cristache et al. (2025) examined how knowledge management processes of knowledge creation, integration, implementation, and sharing affect innovation and organizational performance of large enterprises in Romania. The findings indicated that organizations with strong knowledge creation and sharing processes have a significantly higher likelihood of achieving superior innovation outcomes. Other studies examining the relationship between knowledge management processes and innovation (Mardani, et al., 2018; Garcia-Piqueres et al., 2019; Simanaviciene et al., 2021; Thang &Tuan, 2020; Bawa et al., 2023) have demonstrated a positive relationship between knowledge management and innovation.

A study by Abdi et al. (2018) examining the direct and indirect effect of organizational culture, knowledge management and organizational learning on innovation in Automotive Industry in Iran revealed that knowledge management was a significant mechanism to enhance innovation and corporate performance. The results confirmed that there is a significant and positive relationship between knowledge management and innovation. However, the study examined knowledge management in terms of knowledge creation, dissemination and storage. Applying organizational learning as a mediating variable in their research that evaluated the effect of knowledge management on organizational innovation, Nouri et al. (2017) established that there is a positive effect of knowledge management and organizational learning on innovation. Besides, the analysis returned a positive relationship between organizational learning and innovation thus, the conclusion that learning mediates the relationship between knowledge management and organizational innovation. Another study investigating the impact of knowledge management on organizational innovation by Chibuzor et al. (2019) at Camila Oil Ltd, Nigerian oil industry, showed that knowledge acquisition, application, and sharing have a significant effect on organizational and process innovation. The study concluded that given the dynamic nature of the business environment characterized by radical and continuous

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changes, investment in knowledge management and innovation by a firm is crititical in creating sustainable competitive advantage.

Ononye and Igwe (2019) conducted a study in 12 state-owned public enterprises in Southern Nigeria to investigate the relationship between sharing of knowledge and innovation. The study found that knowledge sharing positively contributes to innovation performance. Nawab et al. (2015) did research that examined the mediating effect of innovation in the link between knowledge management and business management across SMEs in Rwanda. Using a cross-sectional survey and quantitative methodological approaches the results showed that knowledge management practices which are knowledge creation, knowledge sharing and knowledge utilization have an impact on the banking industry by contributing to enhance innovation. A study by Mutinda (2017) to examine knowledge management and innovation among Commercial Banks in Kenya, revealed that knowledge creation and dissemination had a positive effect on the banks' innovativeness.

The studies that have explored the effect of knowledge management practices on innovation have not examined the effect of all the dimensions of knowledge management on innovation. Most of these studies focused only on knowledge creation and knowledge dissemination as dimensions of knowledge management with scanty attention on knowledge storage and knowledge application. Thus, the current research bridges this gap by examining the integrative effect of knowledge generation, knowledge sharing, knowledge storage and knowledge application on innovation within the context of commercial banks in Kenya.

III. METHODOLOGY

3.1 Research Design

This study employed an explanatory research design as it sought to determine cause and effect relationships between knowledge management practices and innovation. The study also adopted a census and cross-sectional survey since data was collected from all the commercial banks at a single period in time.

3.2 Study Population

The population in this study comprised commercial banks in Kenya. According to Central Bank of Kenya, there were 38 commercial banks registered in Kenya as at August 2024 (Central Bank of Kenya, 2024). Given the small number of the banks, the study adopted a census survey.

3.3 Data Collection

This study used primary data, which was collected using a questionnaire. The questionnaire contained closed ended questions on a five-point Likert scale. Respondents were asked to express their perceptions regarding adoption of the aspects of knowledge management practices and innovation in the organizations. The unit of analysis was the firm, hence the study targeted one respondent from each of the 38 commercial banks. The respondents included the executive officers in the banks who are deemed to have an understanding of knowledge management practices and innovation in the organizations.

3.4 Measurement of Variables

Building on the literature review, knowledge management was conceptualized in terms of knowledge generation, knowledge sharing, knowledge storage and knowledge application. A questionnaire, comprising four dimensions of knowledge management practices and their related items was designed. Knowledge management practices indicators consists of knowledge generation items adopted from Rahimi et al. (2008), knowledge sharing items adopted from Ngoc-tan and Gregar (2008) and Awaja et al. (2018), knowledge storage items of measurement borrowed from Taraszewski (2017) and Donate et al. (2015), and knowledge application items adopted from Papademetriou and Masouras (2015). Using a Likert-type scale, the respondents indicated the extent to which they agreed or disagreed with each of the statements on knowledge management practices ranging from 1 (strongly disagree) to 5 (strongly agree).

The dependent variable (innovation) was also operationalized in four dimensions, that is, product innovation whose items were adopted from Polder et al. (2010), process innovation drawn from Sofiyabadi et al. (2020), marketing innovation as conceptualized by Lundell and Varga (2021) and organizational innovation (Chausset & Namara, 2014; Demircioglu, 2016). In measuring innovation, a Likert-type scale was used; respondents were required to indicate the extent to which they agreed or disagreed with each of the statements on innovation ranging from 1 (strongly disagree) to 5 (strongly agree).

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3.5 Validity and Reliability Analysis

Validity assessment was carried out to determine the appropriateness and structure of the research instrument. The assessment of validity of the research instrument was done through the guidance of academic staff at the Faculty of Commerce, Egerton University.

To assess reliability of the research instrument, Cronbach's alpha coefficient was used. Nunnally and Bernstein (1994) recommended a minimum acceptable reliability coefficient of 0.7. Thus, a threshold of 0.7 was used to assess reliability.

3.6 Data Analysis

Descriptive statistics, that is mean and standard deviation were employed to describe the research variables. Pearson correlation analysis was used to assess how knowledge management strategies are related with innovation. To test the research hypothesis H_1, which stated that knowledge management practices have a positive effect on innovation, the following multiple regression model was used:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \varepsilon$$

Where: Y = Innovation, β_0 = constant, β_1 - β_4 = regression coefficients, x_1 = knowledge generation, x_2 = knowledge sharing, x_3 = knowledge storage, x_4 = knowledge application, Ɛ= Error term

IV. FINDINGS & DISCUSSION

4.1 Response Rate

To collect data for this study, questionnaires were distributed to 38 commercial banks. After follow-ups, questionnaires from 33 companies were completed and returned, which constituted a response rate of 86.8 percent. This response rate was considered good as suggested by Bryman and Bell (2007).

4.2 Descriptive Statistics for Study Variables

The study examined the dimensions of knowledge management practices and innovation in the organizations. This was done using means and standard deviations.

4.2.1 Descriptive Statistics for Knowledge Generation

The study examined knowledge generation in the commercial banks. Respondents were asked to indicate the extent to which they agreed that each of the statements on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), described their firms. The results are presented in Table 1.

Table 1

Descriptive Statistics for Knowledge Generation

Statement	Mean	STD
The bank has a system for generating and acquiring knowledge from sources like competitors, employees, business partners and customers	4.36	.895
The bank undertakes benchmarking with the best industry knowledge generation practices	4.36	.929
The bank sends employees for external trainings on knowledge generation	4.15	1.149
The bank invests in research & development designed for knowledge generation	4.36	1.025
The bank has tasked certain employees to identify best knowledge generation practices in the industry and share with management	4.18	.983
Overall Mean	**4.28**	

N = 33

As shown in Table 1, the overall mean for knowledge generation was 4.28. The responses on all the items indicate high mean scores and low standard deviations. These results indicate that the respondents agreed with the statements in regard to knowledge generation. The results were interpreted to mean that the firms practice knowledge generation to a great extent. The results show that the commercial banks generate knowledge through creation of systems for generating and acquiring knowledge from sources like competitors, employees, business partners, and customers (Mean = 4.36, Std. Dev. = 0.895), benchmarking with the best industry knowledge generation practices (Mean = 4.36, Std. Dev. = 0.929), sending employees for external trainings on knowledge generation (Mean = 4.15, Std. Dev. 1.149), investing in research and development designed for knowledge generation (Mean= 4.36, Std. Dev. = 1.025), and tasking certain employees to identify best knowledge generation practices in the industry and share with management (Mean = 4.18, Std. Dev. = 0.983).

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4.2.2 Descriptive Statistics for Knowledge Sharing

The study examined knowledge sharing in the firms. This was done using means and standard deviations. The results are presented in Table 2.

Table 2

Descriptive Statistics for Knowledge Sharing

Statement	Mean	STD
The bank has a formalized knowledge sharing processes	4.52	.755
The bank holds training sessions and conferences often for employees on knowledge sharing	4.76	.614
The bank releases relevant reports and information on time to the employees and other relevant institutions	4.55	.833
Knowledge sharing infrastructure and equipment (inter-net and intranet) is easily available to all employees	4.76	.502
New employees are assigned mentors to help them on personal work and accelerate their learning	4.00	1.225
Employees are encouraged to share past failures and successes as required	3.61	1.171
Employees hold brainstorming sessions to come up with suggestions for solving problems in order to improve cur-rent organizational policies	4.15	.939
Overall Mean	**4.34**	

N = 33

The results in Table 2, show that the overall mean for the items on knowledge sharing is 4.34. The high mean scores for knowledge sharing items were interpreted to mean that the firms practice knowledge sharing to a great extent. The results reveal that knowledge sharing in the firms is done through formalized knowledge sharing processes (Mean = 4.52, Std. Dev. = 0.755), training sessions and conferences for employees on knowledge sharing (Mean = 4.76, Std. Dev. = 0.614). Also, the bank releases relevant reports and information on time to the employees and other relevant institutions (Mean = 4.55, Std. Dev. = 0.833), and ensuring easy availability of knowledge sharing infrastructure and equipment (internet and intranet) to all employees (Mean = 4.76, Std. Dev. = 0.502). The findings suggest that commercial banks in Kenya are well aware of the critical role knowledge sharing plays in achieving organizational outcomes.

4.2.3 Descriptive Statistics for Knowledge Storage

Knowledge storage in the banks was assessed on a five-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). The data was analyzed using means and standard deviations. The results are presented in Table 3.

Table 3

Descriptive Statistics for Knowledge Storage

Statements	Mean	STD
Knowledge is kept in databases/repositories	4.45	.833
The bank has knowledge storage and access procedures manual	4.30	1.212
The bank has established knowledge archival systems	4.58	.708
Documenting lesson learned from assignment is required in the bank	4.18	.983
The bank has secure knowledge storage mechanism	4.52	.795
Grand Mean	**4.41**	

N = 33

The findings in Table 3 show that the overall mean for knowledge storage is 4.41. This demonstrates that commercial banks in Kenya practice knowledge storage to a great extent. The respondents agreed that knowledge is kept in databases/repositories (Mean = 4.45, Std. Dev. = 0.833). It was also revealed that the banks have knowledge storage and access procedures manual (Mean = 4.30, Std. Dev. = 1.212); and the banks have established knowledge archival systems (Mean = 4.58, Std. Dev. = 0.708). Further, documentation of lessons learned from assignment is in the banks (Mean = 4.18, Std. Dev. = 0.983); and there is a secure knowledge storage mechanism in the banks (Mean = 4.52, Std. Dev. = 0.795). By maintaining a well organized and accessible knowledge base, banks can make better decisions, preserve institutional knowledge, ensure consistency, and leverage data to stay competitive in a rapidly changing financial landscape.

4.2.4 Descriptive Statistics for Knowledge Application

Knowledge application in the commercial banks in Kenya was analysed using means and standard deviations. Table 4 presents the results.

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Table 4

Descriptive Statistics for Knowledge Application

Statement	Mean	STD
Bank leadership has pioneered and driven knowledge management adoption and use	4.48	.834
The bank makes management decisions based on information	4.39	.788
The bank has structured manner of ensuring knowledge management application in daily operations	4.55	.905
The bank uses information technology to enhance knowledge application	4.58	.751
Our bank uses knowledge acquired to design new products and services	4.45	.833
Grand Mean	**4.49**	

N = 33

The results depicted in Table 4 indicate that bank leadership has pioneered and driven knowledge management adoption and use (Mean = 4.48, Std. Dev. = 0.834). The banks make management decisions based on information (Mean= 4.39, SD= 0.788). The respondents further agreed that the banks have structured manner of ensuring knowledge management application in daily operations (Mean = 4.55, Std. Dev. = 0.905). The results show that the banks use information technology to enhance knowledge application (Mean = 4.58, Std. Dev. = 0.751). Respondents also agreed that the banks uses knowledge acquired to design new products and services (Mean = 4.45, Std. Dev. = 0.833). The overall mean for all the items for knowledge application is 4.49. The results demonstrate that the firms apply knowledge.

4.2.5 Descriptive Statistics for Innovation

The study examined innovation in the commercial banks in Kenya. Respondents were asked to indicate the extent to which they agreed that each of the statements on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree), described their firms with regard to the dimensions of innovation. Table 5 presents the results of the analysis.

Table 5

Descriptive Statistics for Innovation

Statements	Mean	STD
Product Innovation	**4.33**	
There is improved quality of new products compared to current ones	4.27	.761
The bank improves existing products and services leading to improved ease of use and customer satisfaction	4.24	.561
The bank develops new products with technical specifications and features differing from the current ones	4.19	.792
The bank has increased product variety	4.39	.747
The bank has tailored bank product	4.55	.711
Process Innovation	**4.33**	
Our bank has determined and eliminated non-value activities in delivery related processes	4.21	.893
Our bank has decreased variable cost in logistic related processes	4.45	.754
Our bank adopts advanced real-time process control technology thereby increasing delivery speed	4.36	.859
Our bank has increased process output quality	4.24	.902
The bank has renewed the production and quality management systems	4.39	.788
Our bank optimizes process cost on a continuous basis in providing services	4.30	.728
Our bank constantly updates methods for upgrading current services and techniques for designing new ones	4.33	.777
Marketing Innovation	**4.35**	
Our bank uses both existing and new platforms to reach our customers	4.76	.502
Our bank has made changes to the existing products and services channels to stay competitive in the market	4.45	.754
Our bank uses both digital and published media to advertise our products and services	3.97	.961
Our bank adapts new marketing strategies to maintain and acquire new customers	4.36	.742
Changes in the business environment influence our marketing strategy(ies)	4.21	.820
Organizational Innovation	**4.23**	
The bank allows the opportunity to employees to influence decisions that are made within the organization	3.82	1.158
The bank has renewed/improved the organization structure to facilitate coordination between different functions such as marketing and finance	4.21	.960
The bank has renewed/improved the routines, procedures and processes employed to execute firm activities in innovative manner.	4.42	.708
The bank encourages employees to give ideas towards improvement	4.46	.603
Overall Mean	**4.31**	

N = 33

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The results in Table 5, shows that the overall mean for the dimensions of innovation is 4.31. The high mean scores for innovation items were interpreted to mean that the firms practice innovation to a great extent. The results reveal that the commercial banks practice all the aspects of innovation, namely product innovation (Mean = 4.33), process innovation (Mean = 4.33), marketing innovation (Mean = 4.35) and organizational innovation (4.23) to a great extent. The results suggest that the firms recognize the importance of innovation in achieving customer satisfaction and competitive advantage.

4.3 Correlation Analysis

The study examined the relationship between knowledge management practices and innovation. This was examined using Pearson's correlation analysis. Table 6 presents the findings.

Table 6

Correlation Matrix for Knowledge Management Practices and Innovation

	Knowledge generation	Knowledge sharing	Knowledge storage	Knowledge application	Innovation
Knowledge generation	1				
Knowledge sharing	.796**	1			
Knowledge storage	.748**	.735	1		
Knowledge application	.816**	.684**	.657**	1	
Innovation	.616**	.528**	.448**	.602**	1

The results in Table 6 reveal a positive and significant correlation between knowledge generation and innovation ($r = 0.616$, $p < 0.05$). The study also found positive and significant correlation between knowledge sharing and innovation ($r = 0.528$, $p < 0.05$). There was also a positive and significant correlation between knowledge storage and innovation ($r = 0.448$, $p < 0.05$). The results also indicate a positive and significant relationship between knowledge application and innovation ($r = 0.602$, $p < 0.05$).

4.3 Test of Hypothesis

The study sought to examine the effect of knowledge management practices on innovation in commercial banks in Kenya. It was hypotheisized that knowledge management practices have a positive effect on innovation. To test the hypothesis, multiple regression analysis was performed. The results are presented on Table 7.

Table 7

Multiple Regression Results for Effect of Knowledge Management Practices on Innovation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.644[a]	.414	.331	.44280

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.885	4	.971	4.953	.004[b]
	Residual	5.490	28	.196		
	Total	9.375	32			

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.521	.608		2.502	.018
	Knowledge generation	.232	.207	.353	1.120	.002
	Knowledege sharing	.097	.221	.112	.438	.035
	Knowledge storage	.071	.174	.095	.407	.017
	Knowledge application	.225	.189	.300	1.191	.044

a. Dependent Variable: Innovation

b. Predictors: (Constant), Knowledge application, Knowledge storage, Knowledege sharing, Knowledge generation

The results in Table 7 indicate that knowledge management practices (knowledge generation, knowledge storage, knowledge sharing, and knowledge application) accounted for 41.4% of the variation in innovation (R Square = 0.414).

The ANOVA results show that the effect of knowledge management practices on innovation was statistically significant ($F = 4.953$, $p < 0.05$). Hence, the research hypothesis was supported. Thus, it is concluded that knowledge management practices have a positive and significant effect on innovation.

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All the four dimensions of knowledge management practices, knowledge generation, sharing, storage, and application, have a positive and significant effect on innovation. Knowledge generation ($\beta = 0.353$, $t = 1.120$, $p < 0.05$) and knowledge application ($\beta = 0.300$, $t = 1.191$, $p < 0.05$) show greater effect on innovation, suggesting that banks that focus on creating and utilizing knowledge are likely to be more innovative. Although knowledge sharing ($\beta = 0.112$, $t = 0.438$, $p < 0.05$) and knowledge storage ($\beta = 0.095$, $t = 0.407$, $p < 0.05$) also have a positive and significant effect on innovation, their effect is relatively smaller.

The results of this study demonstrate that knowledge management practices, namely knowledge creation, knowledge sharing, knowledge storage and knowledge utilization have a positive and significant effect on innovation. These findings are consistent with the findings of the study by Cristache et al. (2025) that found that knowledge creation and sharing significantly influenced innovation; and a study by Simanaviciene that found that knowledge generation has a positive correlation with organizational innovation. The findings of this study also support the findings of studies by Mardani et al. (2018), Garzia-Piqueres et al. (2019), Thang and Tuan (2020), and Bawa et al. (2023) that found that knowledge creation, knowledge integration, and knowledge application facilitate innovation and performance. Thus, this study confirms prior arguments and empirical findings that knowledge management processes have positive effect on innovation outcomes.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The overall objective of this study was to establish the effect of knowledge management practices on innovation in commercial banks in Kenya. From the findings of this study, it was established that knowledge management practices have a positive and significant effect on innovation. The findings demonstrate that effective management of knowledge processes enhances the ability of banks to innovate. Specifically, knowledge generation, knowledge storage, knowledege sharing, and knowledge application enhance innovation.

5.2 Recommendations

The findings of this study reveal that knowledge management practices have a positive effect on innovation. The findings have managerial implications. To enhance innovation and responsiveness to the changes in the dynamic environment, organizations should create systems required for effective knowledge management. This may include generating and acquiring knowledge from sources such as competitors, employees, business partners and customers; benchmarking with the best industry knowledge generation practices, and sending employees for external trainings on knowledge generation, research and development, and benchmarking. The firms also need to develop effective systems and processes for storing and sharing knowledge, and efficiently practice knowledge application to foster innovation.

The findings contribute to knowledge-based view by confirming a positive effect of knowledge management practices on innovation. The study emphasizes that as knowledge is created and disseminated throughout the firm, there is the potential to contribute to the firm's innovation. The study should be replicated in other sectors and other countries. Such replication could further determine whether the results of this study can be generalized to other sectors or countries with different contextual conditions. This will enhance understanding of the relationship between knowledge management practices and innovation in different contexts.

REFERENCES

Abdi, K., Mardani, A., Senin, A. A., Tupenaite, L., Naimaviciene, J., Kanapeckiene, L., & Kutut, V. (2018). The effect of knowledge management, organizational culture, and organizational learning on innovation in the automotive industry. *Journal of Business Economics and Management, 18*(1), 1–19.

Awaja, D., Awaja, A., & Raju, V. (2018). Organizational innovation by knowledge management processes in Palestinian universities. *International Journal of Creative Research Thoughts (IJCRT), 6*(2), 941–948.

Bawa, S., Attah, P. K., Agougil, A., & El Harch, M. (2023). Impact of knowledge management on firms' innovation performance. *Technology and Investment, 14*, 293–328.

Brix, J. (2017). Exploring knowledge creation processes as a source of organizational learning: A longitudinal case study of a public innovation project. *Scandinavian Journal of Management, 33*(2), 113–127.

Bryman, A., & Bell, E. (2007). *Business research methods*. Oxford University Press.

Central Bank of Kenya. (2024). *Banking sector innovation survey 2024*. Nairobi, Kenya.

Chausset, J., & Mc Namara, L. (2014). Measuring organizational innovation in collaboration with a Swedish consultancy firm (Unpublished master's thesis). Chalmers University of Technology.

Chibuzor, A. A., Jovita, O. U., & Onyemachi, U. C. (2019). Knowledge management and organizational innovation. *Strategic Journal of Business and Social Science (SJBSS), 2*(2), 1–20.

Licensed Under Creative Commons Attribution (CC BY-NC)

Cristache, N., Croitoru, G., & Florea, N. V. (2025). The influence of knowledge management on innovation and organizational performance. *Journal of Innovation & Knowledge, 10*, 1–17.

Demircioglu, M. A. (2016). *Global encyclopedia of public administration, public policy, and governance*. Demircioglu, Mehmet Akif.

Donate, M. J., & Pablo, J. D. S. De. (2015). The role of knowledge-oriented leadership in knowledge management practices and innovation. *Journal of Business Research, 68*(2), 360–370.

Fu, Q. (2022). How innovation is created: A conceptual framework from a knowledge-based view. In *Proceedings of the 23rd European Conference on Knowledge Management* (pp. 406–414).

Ganzer, P. P., Chais, C., & Olea, P. M. (2017). Product, process, marketing, and organizational innovation in industries of the flat knitting sector. *RAI Revista de Administração e Inovação, 14*(2), 321–332.

García-Piqueres, G., Serrano-Bedia, A.-M., & Pérez-Pérez, M. (2019). Knowledge management practices and innovation outcomes: The moderating role of risk-taking and proactiveness. *Administrative Sciences, 9*(75), 1–22.

Kiptalam, A., Komene, J. K., & Buigut, K. (2016). Effect of knowledge management on firm competitiveness: Testing the mediating role of innovation in small and medium enterprises in Kenya. *International Journal of Small Business and Entrepreneurship Research, 4*(5), 1–14.

Kull, A., & Mena, J. (2016). A resource-based view of stakeholder marketing. *Journal of Business Research, 69*(12), 5553–5560.

Leal-Rodríguez, A., Leal-Millán, A., Roldán-Salgueiro, J. L., & Ortega-Gutiérrez, J. (2013). Knowledge management and the effectiveness of innovation outcomes: The role of cultural barriers. *Electronic Journal of Knowledge Management, 11*(1), 62–71.

Lundell, E., & Varga, Z. (2021). Marketing innovation during a crisis: A case study on the responses of Swedish SMEs to the COVID-19 pandemic. Jönköping International Business School.

Mardani, A., Nikoosokhan, S., & Moradi, M. (2018). The relationship between knowledge management and innovation performance. *Journal of High Technology Management Research, 29*(1), 12–26.

Muthami, T., Namusonge, G. S., & Mwirigi, F. M. (2016). The role of organizational innovation in sustainable competitive advantage in universities in Kenya. *The International Journal of Social Sciences and Humanities Invention, 3*(9), 2762–2786.

Mutinda, M. (2017). Knowledge management and innovation among commercial banks in Kenya (Master's thesis). University of Nairobi, Kenya.

Mutuku, J. M. (2014). Strategic responses to the dynamic business environment in Kenya by Old Mutual Kenya Limited (Unpublished MBA project). University of Nairobi.

Mwihia, R. K. (2008). Knowledge management strategy, organizational competence, and competitiveness in Kenya's commercial book publishing industry (Unpublished PhD thesis). University of Nairobi.

Nam, T. H., Tuan, N. P., & Minh, N. Van. (2017). Critical success factors for innovation in Vietnamese firms. *Journal of Industrial Engineering and Management, 10*(3), 522–544.

Nawab, S., Nazir, T., Zahid, M. M., & Fawad, S. M. (2015). Knowledge management, innovation, and organizational performance. *International Journal of Knowledge Engineering, 1*(1), 43–48.

Ngoc-Tan, N., & Gregar, A. (2018). Impacts of knowledge management on innovation in higher education institutions: An empirical evidence from Vietnam. *Economics and Sociology, 11*(3), 301–320.

Nouri, B. A., Ghorbani, R., & Soltani, M. (2017). The effect of knowledge management on organizational innovation with the mediating role of organizational learning (Case study: Agricultural Bank in Iran). *Knowledge Management & Organizational Innovation, 7*(3), 194–211.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. McGraw-Hill.

Ode, E., & Ayavoo, R. (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. *Journal of Innovation and Knowledge, 3*, 210–218.

Olayinka, D., & Nkemdilim, I. (2018). A resource-based view of digital financial services: An exploratory study of Nigerian providers. *Journal of Business Research, 88*, 513–526.

Ongus, R. W., Nyakenyanya, N., Nyamboga, C. M., & Okello, G. (2016). Knowledge management practices and organizational performance in selected campuses of Kisii University, Kenya. *SRELS Journal of Information Management, 53*(5), 349–358.

Ononye, U. H., & Igwe, A. (2019). Knowledge sharing process and innovation success: Evidence from public organizations in southern Nigeria. *Interdisciplinary Journal of Information, Knowledge, and Management, 14*, 183–198.

Papademetriou, C., & Masouras, A. (2015). Knowledge management and the learning organization constitute new means for the managerial appropriation of the knowledge and skills of workers. *International Journal of Management and Business Studies (IJMBS), 5*(1), 42–48.

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Polder, M., Leeuwen, V. G., Mohnen, P., & Wladimir, R. (2010). Product, process, and organizational innovation: Drivers, complementarity, and productivity effects. *CIRANO - Scientific Publications*, 2010s-28, 1–42.

Rahimi, E., Rostami, N. A., Shad, F. S., & Vafaei, V. (2018). The importance of knowledge management on innovation. *Applied Mathematics in Engineering, Management and Technology, 5*(1), 68–73.

Silvia, L., & Rajshekhar, J. (2019). Explaining performance determinants: A knowledge-based view of international new ventures. *Journal of Business Research, 101*, 615–626.

Simanaviciene, Z., Jasinskas, E., Simanavicius, A., & Shaybakova, L. (2021). The impact of knowledge management on organizational innovation. *Advances in Economics, Business and Management Research, 195*, 402–408.

Sofyabadi, J., Valmohammadi, C., & Sabet Ghadam, A. (2020). Impact of knowledge management practices on innovation performance. *IEEE Transactions on Engineering Management, 69*(6), 3225–3239.

Soi, C. C. (2016). Effect of innovation strategies on the performance of firms in the telecommunication industry in Kenya (Unpublished MBA thesis). United States International University-Africa.

Taraszewski, S. A. (2017). Understanding knowledge storage/retrieval system success: An analytic network process perspective (Unpublished Doctor of Business Administration dissertation). Cleveland State University.

Tavassoli, S., & Karlsson, C. (2016). Innovation strategies and firm performance: Simple or complex strategies? *Economics of Innovation and New Technology, 25*(7), 631–650.

Thang, N. N., & Tuan, P. A. (2020). Knowledge acquisition, knowledge management strategy, and innovation: An empirical study of Vietnamese firms. *Cogent Business & Management, 7*(1), 1–15.

Wawira, I. R. (2013). Strategic knowledge transfer as a source of competitiveness at Kenya Power (Unpublished MBA project). University of Nairobi.

Wilson, P., & Campbell, L. (2016). Developing a knowledge management policy for ISO 9001:2015. *Journal of Knowledge Management, 20*(4), 829–844.

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Evaluating the performance of clinical officer anaesthetists' curriculum from Kenya Medical Training College, Kenya

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ABSTRACT

The trend in Kenya is that the number of patients requiring safe anaesthesia services has increased along with the growth of the surgical services. The labour force remains strongly dependent on the COAs that have been trained in the Kenya Medical Training College. Physician anaesthesiologists remain in serious shortage in Kenya, as only less than 200 are available to over 50 million people. This study aimed to evaluate the effectiveness of the Clinical Officer Anaesthetists' curriculum at Kenya Medical Training College. This study was anchored on the Context, Input, Process, Product model. Cross-sectional design was used, which allowed use of both qualitative and quantitative methods. Level five hospitals were selected as the study area. The census method was used for clinical officer anaesthetics (140), and seven anaesthesiologists were interviewed. Questionnaires and interview guides were used for data collection. The Statistical Package for Social Sciences aided data analysis. Qualitative data was coded and reported in narration and verbatim. Strict ethical guidelines were followed in this study. Findings of this study reveal that the perceptions of Clinical Officer Anaesthetists (COAs) trained by KMTC are typically seen as competent, with the mean scores in all domains being 3.63 to 3.72. The correlation analysis shows highly significant and strong relationships between competence in the practice of anaesthesia, effective communication and collaboration, patient outcomes from knowledge and skills and professional development and improvement ($r = 0.957$ to $r = 0.986$, $p = 0.001$). This study concludes that clinical officer anaesthetists trained at KMTC are competent in their practice of anaesthesia and teamwork and positively impactful on patient outcomes. Nevertheless, the possibilities of professional development are still restricted, and there is concern regarding the possibility of long-term development and preparedness foradvanced practice. It recommends that KMTC should enhance its curriculum by incorporating formal continuing professional development like regional anaesthesia, increasing exposure to more advanced anaesthetic methods, and providing more mentorship.

Keywords: Anaesthesia Training, Clinical Officer Anaesthetists (COAs), KMTC Curriculum, Professional Development

I. INTRODUCTION

Quality patient care by anaesthesia is regularly regarded as an essential part of a safe procedure around the world. According to the World Federation of Societies of Anaesthesiologists (WFSA), to maintain patient safety and guarantee excellent perioperative care, anaesthetists should have competency-challenged training that corresponds to the international standards (Gelb *et al.*, 2018). Training systems that combine simulation, mentoring phase and formal evaluation have demonstrated to contribute to great revenue of patient results, and minimize perioperative morbidity (Ruscher, 2024). The Context aspect of the CIPP Model explains the significance of implementing national curriculums aligned to these international standards so that Clinical Officer Anaesthetist (COAs) are fully equipped to perform to international standards.

In Africa alone, the shortage of human resources, poor infrastructure, and disproportionate training opportunities limits the service around anaesthesia (Choo, 2020). In most sub-Saharan countries, anaesthesia provider density is significantly lower than the recommended number of 5 per 100,000 population put forward by WFSA, and some countries have less than 1 provider per 100,000 population (Ho *et al*., 2019). In the literature on the region, non-physician staff members provide most of the care, such as anaesthesia (COA), but authors note that such staff often has problems

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with mentorship and retraction to modern equipment, as well as fail to develop afterward (Ho *et al.*, 2019). The Input aspect of the CIPP Model is quite applicable in this case because the well-being of the institutions of training is evaluated in terms of their provision of proper and appropriate resources, teaching resources, and support systems. As it was proven, the education of anaesthesia could be improved through regional initiatives such as foreign experience exchange and capacity-building systems in order to ensure workforce stability (Mussa & Sweetbert, 2025).

The trend in Kenya is that the number of patients requiring safe anaesthesia services has increased along with the growth of the surgical services, although the labour force remains strongly dependent on the COAs that have been trained in the Kenya Medical Training College (KMTC) (Shirly & Wamai, 2022). The national evaluations have reported the existence of hindrances in the curriculum, financing and infrastructure facets with implications to the quality of training (Mumbo & Kinaro, 2015). The Process element of the CIPP Model is highly important here because it considers the way the curriculum is being applied, this includes the teaching methodologies, clinical placements, and supervision. There has been a demonstration that the curriculum of KMTC gives a competent base of theory and clinical rotations but, there still exists a problem regarding the adequacy of mentorship, exposition to well-advanced techniques and keeping with the changing national health priorities.

KMTC COA curriculum is structured to empower trainees with skills that will give them the competencies of providing safe anaesthesia services in the county and referral hospitals. It is organized with the combination of classroom teaching, simulation and clinical rotations. Nonetheless, assessments have revealed the necessity of constant curriculum revision and implementation to support the introduction of new technologies, reinforce mentorship, and make them relevant to global standards and the needs of the health system in Kenya (Shirly & Wamai, 2022). It is in this connection that that Product element of the CIPP Model would have played a critical role in looking at whether the graduates have the required abilities to be exhibited in the real practice or not. There is some evidence that KMTC graduates are qualified in the provision of anaesthesia of the routine type, still, the shortcomings in advanced practice preparation are observed, especially at the county hospitals that do not have enough resources (Ho *et al.*, 2019; Choo, 2020).

1.1 Statement of the Problem

The specialty of physician anaesthesiologist remains a serious shortage in Kenya as only less than 200 are available to over 50 million people (Nyamai *et al.*, 2013). To overcome this, Kenya Medical Training College (KMTC) produces annually around 120 Clinical Officer Anaesthetist (COA) (Shirly & Wamai, 2022). Though this has bolstered the amount of workforce, there have been fears over the preparedness, competency and citizens trust of the services provided by COAs. This study, thus, sought to evaluate the effectiveness of the Clinical Officer Anaesthetists' curriculum at Kenya Medical Training College from Level Five hospitals in Kenya.

1.2 Objective of the Study

To evaluate the effectiveness of the Clinical Officer Anaesthetists' curriculum at Kenya Medical Training College

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Context, Input, Process, Product (CIPP) Model

Daniel Stufflebeam formulated the Context, Input Process Product (CIPP) model of program evaluation, a decision-based model of evaluation in the 1960s (Stufflebeam, 1971). Contrasting outcome only methods, CIPP Model attaches importance to systematic evaluation of needs and resources fostering implementation and outcomes to promote improvement. In education, health sciences and curriculum assessment (and teacher education and nursing education) it has been used rampantly, and it has served to harmonize training with professional criteria and expectations of the stakeholders (Stufflebeam, 1983; Stufflebeam, 2000).

In Kenya, the importance of systematic frameworks to investigate the quality of teaching practice, resource utilization, and programme evaluation outcomes have as well been the focus of curriculum assessment research (Shirly & Wamai, 2022). Using CIPP Model, the Kenya Medical Training College (KMTC) Clinical Officer Anaesthetists (COAs) curriculum is analysed with the help of the Context evaluation which focuses on the analysis of workforce shortages and healthcare requirements. Input stage: the stage evaluates the curriculum design, resources and standards congruency. The Process evaluation is focused on reviewing teaching strategies, mentorship, and clinical placements and the Product evaluation is focused on the outcomes of measuring the graduate competencies, preparedness, and patient safety. This holistic application will guarantee that KMTC curriculum is evaluated in relevance, quality and impact in the Kenya healthcare system systematically.

2.2 Empirical Review

The international concept of competency-based training of anaesthesia is a pillar of safe perioperative care. The global standards, such as those of the World Federation of Societies of Anaesthesiologists and Royal College of

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Anaesthetists focus on the structured training, supervision, and constant evaluation of all anaesthesia providers, including non-physician cadres (Gelb *et al*., 2018; Kempthorne *et al*., 2017; Royal College of Anaesthetists, 2021). These frameworks facilitate lifelong learning. They are particularly important in low-resource environments where the workforce sustainability and patient safety are closely connected to the quality of training.

The recent world reviews highlight the significance of the curriculum framework which is responsive to the contextual requirements, the active forms of teaching, and the effective means of assessment. These clues support the necessity of the curricula that will be not only technically sound but also flexible to the changing clinical realities and practitioner profiles (Gelb *et al*., 2018).

Empirical evidence in the sub-Saharan Africa has shown that non-physician anaesthesia providers have a crucial role to play in increasing the reach of surgical care, especially in rural and underserved regions. Nonetheless, training situations tend to be out of line with the actualities of practice and will result in competency gaps. Qualitative research notes that mentorship, interprofessional collaboration, and context specific competencies can be used to address these gaps (Al Shamsi, 2020).

Organised continuing professional development (CPD) programs like the SAFE (Safer Anaesthesia From Education) obstetric anaesthesia course have shown significant knowledge and practice changes by non-physician anaesthetists in Kenya and other neighbouring countries. These results indicate that the key to the future of safety and efficacy in the delivery of anaesthesia in the region is specific curriculum reinforcement and mentorship frameworks (Gasparini *et al*., 2021).

The Clinical Officer Anaesthetist (COA) course at Kenya Medical Training College (KMTC) has played a leading role in mitigating the workforce issues of anaesthesia in Kenya particularly in Level Five hospitals. Graduates always testify to the sufficient basic training, but empirical research notes the consistent lack of skills at higher levels like peripheral nerve blocks and epidural anaesthesia (Nyamai, Ng'ang'a, and Mutisya, 2013). These loopholes indicate that curriculum should be revised to reflect the needs of clinical requirements.

General assessments of training clinical in Kenya would be systematic curriculum management, resource match, and ongoing relevance measurement (Shirly & Wamai, 2022). These results are all approached to the necessity of improving the KMTC COA curriculum by continuous evaluation, mentorship reinforcement, as well as competency-based revisions. These gains would see to it that graduates are not only technically competent but also practice-based in the foreseeable intricacies of perioperative care in public health system of Kenya.

III. METHODOLOGY

The descriptive cross-sectional design was used to evaluate the performance of Clinical Officer Anaesthetists' Curriculum from Kenya Medical Training College graduates and work in Level Five hospitals. This design was deemed suitable since it enables the gathering of data at one point in time on a specific population, and it is thus effective in determining the current competence, communication, and professional development of the COAs. Cross-sectional studies are especially applicable in the health sciences to determine the prevalence, discern trends, and provide evidence with which to make policy decisions and revise the curriculum (Creswell & Creswell, 2017). The design allowed a deep comprehension of the study problem as it combined both qualitative and quantitative methods.

The choice of Level Five hospitals as the study locations was strategic because the hospitals have adequate infrastructure and well-developed anaesthesia services (Kenya Medical Training College, 2019). The sampling strategy adopted was non-probability sampling in seven regions in Kenya, where a single county referral hospital was chosen in each region. Based on these facilities, a census of available COAs was made, on 140 participants, and seven key informants (in charge anaesthetists) were purposely selected to take part in in-depth interviews.

The structured questionnaires were used to gather quantitative data in the form of Likert scale and closed-ended questions, which were distributed electronically through Google Forms. The qualitative information was acquired using semi-structured interviews using a checklist. Pilot testing of the questionnaires was done to improve reliability and validity, and the inter-rater reliability to facilitate qualitative coding. Internal validity was also enhanced by triangulation of data sources (Kenya Medical Training College, 2019). Strict ethical guidelines were followed, and they included informed consent, anonymity, and ethical approval of the researchers. The Statistical Package of Social Sciences was used to analyse the quantitative data and descriptive statistics, correlation, and regressions were applied to determine the performance determinants. Qualitative sources were transcribed, coded, and thematically analysed to identify the patterns that arise.

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IV. RESULTS & DISCUSSION

4.1 Results

4.1.1 Performance of clinical officer Anaesthetists against the curriculum standards

The study had 140 COA and seven anaesthetists in charge at the facilities. Response rate was 100% for both the COA and anaesthetists in charge. The major areas studied on curricular requirements of the performance of clinical officer anaesthetists, are professional growth, teamwork and communication during their procedures, impacts of knowledge and skills on patient outcomes, and competence in the anaesthetic practice. The results as summarised in Table 1 shows the trends and insights among the participants.

Table I

Performance Assessment of Clinical Officer Anaesthetists against Curriculum Standards

Statement	Strongly Disagree	Strongly Agree	Neutral	Agree	Strongly Agree	Mean	Std Dev.
The colleague demonstrates competence in anaesthesia practice	2.1%	6.3%	39.6%	21.9%	30.2%	3.72	1.033
The colleague effectively communicates and collaborates with the healthcare team during procedures	2.1%	7.3%	36.5%	27.1%	27.1%	3.70	1.017
The colleague's knowledge and skills have positively impacted patient outcomes	1.0%	9.4%	36.5%	26.0%	27.1%	3.69	1.009
The colleague actively seeks opportunities for professional development and improvement	2.1%	8.3%	42.7%	18.8%	28.1%	3.63	1.049

Findings of this study reveals that the perceptions of Clinical Officer Anaesthetists (COAs) trained at KMTC are typically seen as competent, with the mean scores in all domains being 3.63 to 3.72. This shows that the KMTC curriculum has managed to ensure that its graduates possess the necessary competencies that would enable them to deliver routine anaesthesia services. The best score was in competence in anaesthesia practice (M = 3.72, SD = 1.033). this curriculum is very technical. Likewise, teamwork and communication (M = 3.70, SD = 1.017) domain were rated high. This indicates how the curriculum has focused on interprofessional collaboration which is an indispensable competency in the surgical environment. The fact that the COAs influence patient outcomes (M = 3.69, SD = 1.009) is another sign of the usefulness of KMTC training. The last score was in the case of professional development (M = 3.63, SD = 1.049). A good base is being laid by KMTC, but without structured CPD, there is a danger of stagnation.

4.1.2 Relationship Between Clinical Officer Anaesthetists' Performance and Curriculum Standards

The correlation table presents interrelationships among competence, communication, patient outcomes, and professional development, highlighting their strong, statistically significant associations.

Table 2

Relationship Between Clinical Officer Anaesthetists' Performance and Curriculum Standards

No	Correlation		1	2	3	4
1	The colleague demonstrates competence in anaesthesia practice	Pearson Correlation	1			
		Sig. (2-tailed)				
		N	140			
2	The colleague effectively communicates and collaborates with the healthcare team during procedures	Pearson Correlation	.973**	1		
		Sig. (2-tailed)	.000			
		N	140	140		
3	The colleague's knowledge and skills have positively impacted patient outcomes	Pearson Correlation	.966**	.986**	1	
		Sig. (2-tailed)	.000	.000		
		N	140	140	140	
4	The colleague actively seeks opportunities for professional development and improvement	Pearson Correlation	.958**	.957**	.957**	1
		Sig. (2-tailed)	.000	.000	.000	
		N	140	140	140	140

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis shows highly significant and strong relationships between competence in practice of anaesthesia, effective communication and collaboration, patient outcomes from knowledge and skills and finally professional development and improvement (r = 0.957 to r = 0.986, p = 0.001). These results indicate that multidimensionality of professional effectiveness of Clinical Officer Anaesthetists (COAs) is not separate, so technical

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competence, teamwork, and continuous learning are not independent constructs. Practically, it means that the maintenance of safe anaesthesia delivery is not only a matter of individual ability, but also relational and developmental abilities.

4.1.3 Overall Performance Assessment of Anaesthetists

The overall performance of anaesthetists was measured and graded in five levels namely, Poor, Fair, Good, Very Good, and Excellent. The findings indicated that the lowest percentage of the respondents (1.0%) indicated the overall performance of the anaesthetists as Poor, which implies that the very small percentage of the cohort felt that the performance was characterised by critical shortcomings. There was a marginally more percentage (7.3%) that evaluated the performance as Fair, implying that there were possible areas of area of improvement, although within acceptable levels. The biggest proportion of respondents (40.6%) listed the performance as Good. This showed that a significant percentage of the respondents evaluated themselves as working at a competent level and were effective in meeting the expected standards. The percentage that rated their performance as Very Good was 25.0%, which indicates that most respondents viewed the anaesthetists as being beyond the basic competence and demonstrating greater proficiency and effectiveness. Lastly, 26.0% of the respondents classified the performance as Excellent, which is a high level of recommendation to the competence of the anaesthetists and indicates that they were working at the best. The Figure 1 provides the distribution of responses.

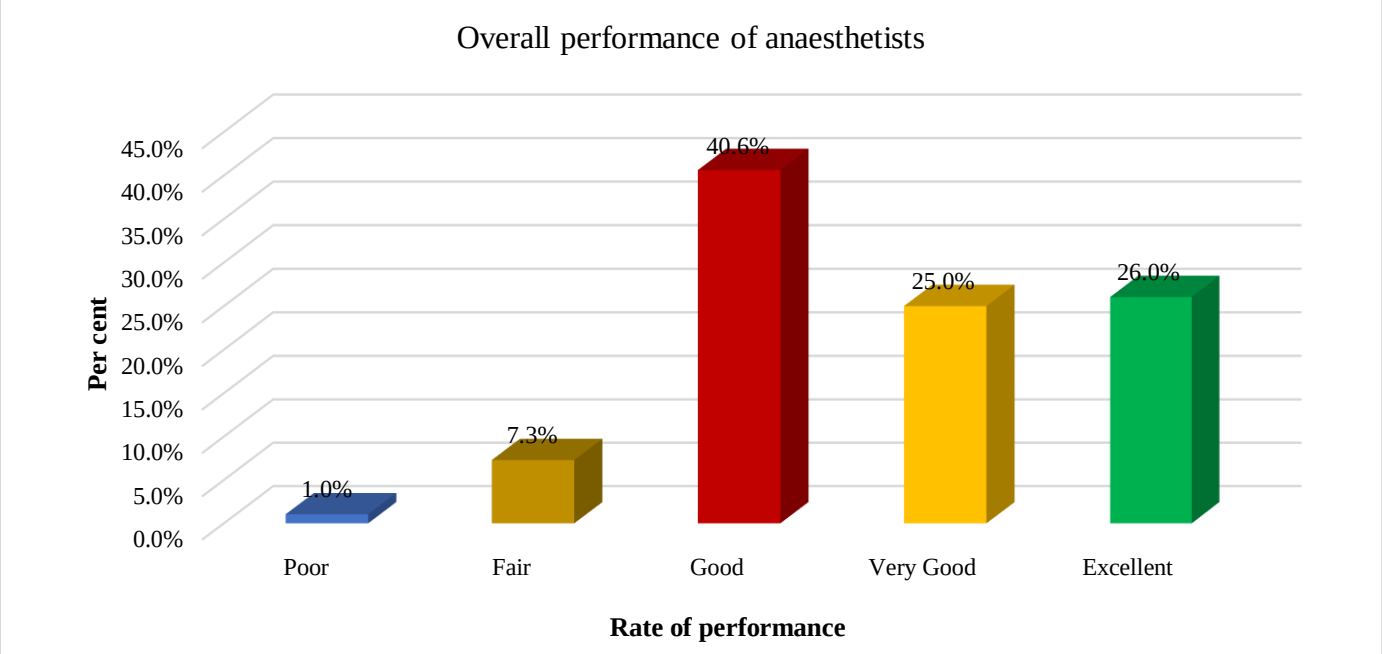

Figure 1
Overall Performance Assessment of Anaesthetists

This data from Figure 1 shows that there is a positive perception of the anaesthetists with regards to their overall performance. It was shown that 91.7% of the students rated the performance from Good to Excellent. Half (51.0%) of them said that the performance was Very Good and or Excellent.

4.1.4 Association between performance of anaesthetist and performance assessment of clinical officer anaesthetists against curriculum standards

The positive correlation between competence in practice of anaesthesia and effective communication and collaboration with the health care team was very strong ($r = 0.900$, $p < .000$), which indicated that the competent were also considered to be effective in communication and collaboration in the team. The relationship with the effect on patient outcomes was also significant ($r = 0.824$, $p < 0.001$), which means that perceived competence is strongly related to positive patient outcomes. Competence correlated positively with seeking professional development ($r = 0.815$, $p < 0.001$) and overall performance ($r = 0.857$, $p < 0.001$) with significance further supporting the importance of perceived competence in the overall performance.

This factor was not only among the variables which demonstrated high correlation with competence but also demonstrated a very strong correlation with overall performance ($r = 0.885$, $p < 0.000$), which implies that effective communication is perhaps one of the most telling qualities of overall high performance. The same level of relationships

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was noted with the influence on patient outcomes ($r = 0.800$, $p < 0.001$) and pursuing professional growth ($r = .830$, $p < 0.000$).

The correlation coefficients showed that there exist strong positive correlations among the influence on patient outcomes and the seeking of professional development ($r = 0.833$, $p < 0.001$) and the overall performance ($r = 0.825$, $p < 0.000$), which show the inseparable nature of clinical skills, the pursuit of professional development, and overall patient outcomes.

The overall performance was significantly related to the seeking of professional development ($r = 0.855$, $p < 0.001$), which confirms that continuous professional growth is highly associated with overall job performance in clinical practice. Everything learned was highly correlated with overall performance, underlining the overall association of competence, communication, patient impact, and professional development between overall job performance of anaesthetists.

Table 3

Correlation matrix overall performance of anaesthetist and performance assessment of clinical officer anaesthetists against curriculum standards

	Correlation		1	2	3	4	5
1	The colleague demonstrates competence in anaesthesia practice	Pearson Correlation	1				
		Sig. (2-tailed)					
		N	140				
2	The colleague effectively communicates and collaborates with the healthcare team during procedures	Pearson Correlation	.900**	1			
		Sig. (2-tailed)	0.000				
		N	140	140			
3	The colleague's knowledge and skills have positively impacted patient outcomes	Pearson Correlation	.824**	.800**	1		
		Sig. (2-tailed)	0.000	0.000			
		N	140	140	140		
4	The colleague actively seeks opportunities for professional development and improvement	Pearson Correlation	.815**	.830**	.833**	1	
		Sig. (2-tailed)	0.000	0.000	0.000		
		N	140	140	140	140	
5	Overall performance of colleague anaesthetist	Pearson Correlation	.857**	.885**	.825**	.855**	1
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	
		N	140	140	140	140	140

**. Correlation is significant at the 0.01 level (2-tailed).

4.2 Discussion

The results of the study confirm that Clinical Officer Anaesthetists (COAs) trained and graduated at KMTC are perceived to be clinically competent, especially in the provision of routine anaesthesia. The large means of the competence (M = 3.72), communication (M = 3.70) and patient outcomes (M = 3.69) indicate that the curriculum is attaining its core objective, which is to train safe and effective anaesthesia providers to the Kenya public health system. The results reflect Gelb *et al*. (2018) and Kempthorne *et al*. (2017) who reckon that competency-based training plays a vital role in offering safe perioperative care, especially in under-resource settings.

However, the relatively low outcome in professional development (M = 3.63), and the problems with stagnation, show a massive gap in the skill training of COAs after they graduate. This concurs with the study by Nyamai *et al*. (2013) that found out that, despite the confidence of KMTC graduates in dealing with the simple procedures, they were not exposed to more complex ones such as peripheral nerve blocks and epidural anaesthesia. This concern can be summarized by the observation of one of the supervisors:

> *"The curriculum provides them with a solid base, but unless they receive organised continuing professional development, their skills will stagnate after a couple of years."*

This highlights why CPD needs to be institutionalised as a formal curriculum-based extension, to enable COAs to keep up with the changing clinical needs and technology.

The correlation between communication and overall performance (r = 0.885, p < 0.001) suggests the pivotal role of interprofessional collaboration regarding safety in anaesthesia. This is a good sign of the focus of the curriculum on team learning and clinical placements. The results are consistent with those of Gasparini *et al*. (2021), who showed that systematic CPD programs such as the SAFE course have a strong impact on the teamwork and procedural safety of non-physician anaesthetists in Kenya. This is supported by qualitative data further:

> *"The COA are strong in teamwork. They interact well with the nurses and surgeons, and this makes the operating theatre run smoothly."*

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Nevertheless, a lack of mentorship is also observed in the process dimension. Supervisors reported that the COAs are very effective in routine cases, however, they lack confidence even in complex cases, which is caused by a lack of mentorship:

> *"Even patient outcomes are better since more COAs were implemented in this area, but active mentorship is still wanting, and this influences their confidence levels in complex cases."*

This implies that the delivery systems of the curriculum should be reinforced including delivery methodology especially clinical supervision and feedback processes to ensure the gap between theoretical and advanced clinical preparation is reduced.

The input level issues to some degree limit the effectiveness of the curriculum. The absence of experience with modern tools like fibreoptic video laryngoscopy and techniques of regional anaesthesia are manifestations of inadequate infrastructure. This can be compared to the data provided by Ho *et al*. (2019) who stated that the training of anaesthesia in sub-Saharan Africa is frequently blocked by insufficient equipment, small number of faculty and lack of access to modern technologies. This can be depicted by the remark of one of the supervisors:

> *"The KMTC COAs show good fundamental abilities in the provision of anaesthesia particularly in the field of routine cases, but they require additional experience in advanced access methods such as regional blocks. Video laryngoscopy(fibre) as a tool for teaching"*

To counter this, there is need to invest specifically in simulation laboratories, up-to-date pedagogical tools and staff training. These are not peripheral inputs, but the key to the attainment of the planned outcomes of the curriculum.

It is possible to find the appropriateness of the curriculum to the requirements of Kenya health system in the provision of workforce. The KMTC COA programme has a considerable gap because less than 200 physician anaesthesia's serve the over 50 million people (Nyamai *et al*., 2013). It is affirmed by Shirly and Wamai (2022) that COAs in Level Five hospitals are the individuals that do most anaesthesia services since they cannot be replaced.

Nonetheless, Mumbo and Kinaro (2015) warn that the effectiveness of curriculum should not be measured, solely, by what the graduates do, but it should also be responsive to the systemic limitations to it, namely, financing, infrastructure, and policy support. The fact that the correlation between the professional development and the overall performance are strong ($r = 0.855$, $p < 0.001$) supports the argument that the relevance of the curriculum should be maintained by the constant adoption of the national strategies of surgical and anaesthesia scale-up.

The findings suggests that although KMTC Clinical Officer Anaesthetists (COA) curriculum is successful in equipping graduates with the requirements of practicing routine anaesthesia, its implementation effects are hampered by lack of mentorship, continuing professional development (CPD), and resources. The study suggests the ability to solve these challenges by improving the curriculum with advanced techniques and simulation-based learning, providing structured mentorship systems, especially in county hospitals, making CPD an obligatory part of the curriculum, and making COA training consistent with the overall strategy of the Kenyan workforce in surgical and anaesthesia. These insights have a foundation grounded in the CIPP evaluation model that provides a comprehensive framework of enhancing curriculum relevance, graduate competence and systemic health outcomes.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The results show that Clinical Officer Anaesthetists who developed their skills at KMTC are competent in their practice of anaesthesia, teamwork, and positively impactful on patient outcomes. Nevertheless, the possibilities of professional development are still restricted, and there is concern regarding the possibility of long-term development and preparedness to the advanced practice. Although the curriculum offers a solid technical base, long term performance needs to be designed to promote mentorship and ongoing learning and reward systems to guarantee that the graduates are confident, flexible, and relied upon in the changing healthcare system in Kenya.

5.2 Recommendations

This study recommends that KMTC should enhance its curriculum by incorporating formal continuing professional development, increase exposure to more advanced anaesthetic methods, and more mentorship. Moreover, institutional systems are expected to focus on reviewing the curriculum, professional recognition, and resource support to maintain competence, confidence in complicated cases and strengthening the trust of the population.

REFERENCES

Al Shamsi, A. (2020). *An investigation into knowledge sharing in cross professional teams in healthcare: A multi-method, qualitative case study design* (Doctoral dissertation, University of Sheffield).

Choo, V. (2020). *The state of anesthesia practice in Sub-Saharan Africa: Statistics, case studies, and ways forward* (Doctoral dissertation).

Licensed Under Creative Commons Attribution (CC BY-NC)

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Gasparini, M., Khan, S., Patel, J. M., Parekh, D., Bangash, M. N., Stömpfle, R., Shah, A., Baharlo, B., Soni, S., & Collaborators (2021). Renal impairment and its impact on clinical outcomes in patients who are critically ill with COVID-19: a multicentre observational study. *Anaesthesia*, *76*(3), 320–326. https://doi.org/10.1111/anae.15293

Gelb, A. W., Morriss, W. W., Johnson, W., Merry, A. F., Abayadeera, A., Belîi, N., Brull, S. J., Chibana, A., Evans, F., Goddia, C., Haylock-Loor, C., Khan, F., Leal, S., Lin, N., Merchant, R., Newton, M. W., Rowles, J. S., Sanusi, A., Wilson, I., Velazquez Berumen, A., … International Standards for a Safe Practice of Anesthesia Workgroup (2018). World Health Organization-World Federation of Societies of Anaesthesiologists (WHO-WFSA) International Standards for a Safe Practice of Anesthesia. *Anesthesia and analgesia*, *126*(6), 2047–2055. https://doi.org/10.1213/ANE.0000000000002927

Ho, M., Livingston, P., Bould, D., Nyandwi, J. D., Nizeyimana, F., Uwineza, J. B., & Urquhart, R. (2019). Barriers and facilitators to implementing a regional anesthesia service in a low-income country: A qualitative study. *Pan African Medical Journal, 32*, Article 152. https://doi.org/10.11604/pamj.2019.32.152.17246

Kempthorne, P., Morriss, W. W., Mellin-Olsen, J., & Gore-Booth, J. (2017). The WFSA global anesthesia workforce survey. *Anesthesia & Analgesia, 125*(3), 981–990. https://doi.org/10.1213/ANE.0000000000002258

Kenya Medical Training College. (2019). *Annual report on curriculum and training standards*. Nairobi, Kenya: Kenya Medical Training College.

Mumbo, H. M., & Kinaro, J. W. (2015). Assessment of quality and relevance of curricula development in health training institutions: a case study of Kenya. *Human resources for health*, *13*, 67. https://doi.org/10.1186/s12960-015-0048-9

Mussa, S. S., & Sweetbert, A. (2025). Regional Anaesthesia in Low-Resource Settings: Focusing on Sub-Saharan Africa. IntechOpen. https://doi.org/10.5772/intechopen.1011846

Nyamai, K., & Mutisya, R. (2013). Impact of clinical officer anaesthetist training programme at the Kenya Medical Training College, Nakuru, on trainee satisfaction, quality of practice, and cadre shortfall alleviation. *East African Medical Journal, 90*(7), 226–234.

Royal College of Anaesthetists. (2021). *Anaesthesia curriculum 2021*. London, UK: Author.

Ruscher, A. (2024). *Optimizing postoperative care: The significance of simulation training in reducing adverse events and promoting patient safety* (Doctoral dissertation, Northeastern University).

Shirley, H., & Wamai, R. (2022). A Narrative Review of Kenya's Surgical Capacity Using the Lancet Commission on Global Surgery's Indicator Framework. *Global health, science and practice*, *10*(1), e2100500. https://doi.org/10.9745/GHSP-D-21-00500

Stufflebeam, D. L. (1971). *The relevance of the CIPP evaluation model for educational accountability.* Columbus, OH: Ohio State University.

Stufflebeam, D. L. (1983). The CIPP model for program evaluation. In F. F. Madaus, M. Scriven, & D. L. Stufflebeam (Eds.), *Evaluation models: Viewpoints on educational and human services evaluation* (pp. 117–141). Kluwer. https://doi.org/10.1007/978-94-009-6669-7_1

Stufflebeam, D. L. (2000). The CIPP model for evaluation. In D. L. Stufflebeam, G. F. Madaus, & T. Kellaghan (Eds.), *Evaluation models: Viewpoints on educational and human services evaluation* (pp. 279–317). Springer Netherlands.

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Influence of class teachers' teaching experience on the self-esteem of orphaned pupils in public junior schools in Nairobi County, Kenya

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ABSTRACT

The self-esteem of orphaned pupils plays a critical role in their academic performance, social development, and emotional resilience. In Nairobi County, Kenya, where a significant number of children in public junior schools have lost one or both parents, it becomes imperative to understand the role educators play in shaping their psychological well-being. Among various teacher characteristics, teaching experience is presumed to influence how effectively educators support emotionally vulnerable learners. This study sought to investigate the relationship between class teachers' teaching experience and the self-esteem of orphaned pupils in public junior schools in Nairobi County. Guided by Rosenberg's Self-Esteem Theory (1965), Harter's Self-Perception Profile (1985), and Self-Determination Theory by Ryan and Deci, the study employed a correlational research design targeting 192,113 orphaned pupils across 237 public junior schools. A stratified random and purposive sampling technique was used to select a sample of 400 orphaned pupils and their respective class teachers. Data were collected through structured questionnaires and analyzed using both descriptive statistics and Pearson's chi-square tests. The findings revealed a statistically significant relationship between teaching experience and the self-esteem of orphaned pupils ($\chi^2 = 169.93$, $p = 0.009$), leading to the rejection of the null hypothesis. Experienced teachers, particularly those with over 10 years in service, were found to foster higher levels of self-esteem among orphaned pupils. These teachers demonstrated greater emotional competence, consistent behavior, and adaptive classroom management styles that provided a sense of stability and reassurance for their learners. In contrast, teachers with limited experience were less effective in responding to the psychosocial needs of orphans, resulting in comparatively lower self-esteem levels among these pupils. These findings emphasize that teaching experience transcends content delivery; it contributes to relational trust, emotional guidance, and the creation of inclusive classroom environments. The study recommends that teacher training programs and education policies should prioritize equipping novice teachers with psychosocial support skills, particularly in multicultural and socioeconomically diverse settings like Nairobi County. Additionally, mentorship programs pairing less experienced teachers with seasoned educators can foster the transfer of affective teaching strategies essential for supporting vulnerable learners. Ultimately, addressing the emotional and psychological needs of orphaned students through experienced and empathetic teaching can significantly enhance their overall development and academic success.

Keywords: Nairobi County, Orphaned Pupils, Public Junior Schools, Self-Esteem, Teaching Experience

I. INTRODUCTION

Orphanhood has become a major concern in Kenya due to its high prevalence in both rural and urban areas. Children become orphans due to the death of both parents or of one parent. Orphanhood affects the psychological wellbeing of children negatively since there is the trauma involved with the loss of parents. Parental deaths that are caused by poverty and diseases have been identified as some of the cause of the problem of orphanhood in Nairobi County, which places the children in a vulnerable and helpless situation. The United Nations Children Fund (UNICEF, 2015) estimates that the number of orphans aged below 18 years amounted to approximately 3.6 million. Such children need to be provided with care, protection, and support in order to make sure that they grow up normally as others. Unless properly guided and provided with psychosocial support, the orphaned children can experience depression, anxiety, aggression, and stress, (Abraha, 2024).

The teacher is the nearest adult to the learner and the learners rely on the teacher to guide and steer them. The class teachers in the school setting should be the initial providers of emotional assistance and modeling behavior in the vulnerable students (Setai, 2023). This is the reason why this paper has attempted to explore the contribution of the nature of class teachers on the psychological wellbeing of orphaned learners in public junior schools in the Nairobi County in Kenya. It was concerned with the relationship between the teachers' teaching experience and the

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psychological wellbeing of the orphaned learners. Psychological wellbeing of the orphaned learners was determined by measuring the self-esteem of learners.

Self-esteem can be defined as the subjective perception of the worth of the individual. Studies have shown that the level of self-esteem in orphaned and non-orphaned students is significantly different, with the former tending to have lower self-worth (Kinyua & Gitumu, 2024). Self-efficacy refers to the perception that a person has to achieve in certain situations or perform a task. The self-efficacy can have significant effects on the manner in which a person sets his/her goals, tasks, and challenges and can be shaped by self-esteem (Ryan & Deci, 2000). The last psychological development stage; self-actualization can be attained once the basic needs and mental needs are satisfied essentially including the esteem needs. Self-actualization means the achievement of the potential of a person, fulfillment of self, an interest in personal development and the best experiences. It is an idea that has its origin in the Humanistic psychology theory, and specifically the theory developed by Abraham Maslow. Maslow (1970) which states that the ultimate stage of psychological development is self-actualization where the potential of the individual is achieved once the low bodily and ego needs have been met.

Orphaned children form a special category of learners with most having a background of both economically and emotionally disadvantaged background. Their lives are characterized by sorrow, instability, uncertainty and in others abuse or neglect. Research has found out that orphaned children experience serious psychosocial problems which influence their educational experiences and general development (Lemeyu et al., 2023). Thus this group of learners needs extra psychosocial assistance to assist them in overcoming difficulties in their real life. The school turns into a second place of belonging and the teacher, principally the class teacher becomes an important person in providing emotional support and creating a feeling of safety and belonging. It has been found that teacher connectedness plays a significant role in resilience and psychological wellbeing of orphaned adolescents (Akilandeswari & Annalakshmi, 2023). The competence of a teacher to successfully meet the needs of orphaned students depends greatly on the professional preparedness of the teacher which entails the academic as well as the affective competence.

The experience of teaching especially, is influential in creating the manner in which a teacher interacts with the learners, in recognizing learners in need and applying support strategies in the classroom. The teachers who have been in the teaching profession longer also have a tendency to have built stronger classroom management, emotional intelligence and adaptive practices that enable them to address the needs of different learners. Research has shown that the efficacy of teachers to teach orphaned learners was significantly different depending on the experience and training of the teachers (Setai, 2023).It's more likely that they have had experience of dealing with such learners before and may thus have tried and tested methods of providing support. Conversely, new teachers might not have this experience and confidence, and they might not be able to detect psychological problems at the initial stages or provide any useful help.

In the Nairobi County scenario, where urban poverty, congested classrooms, and inadequate access to school-based counselling services all impact the situation, the role of the classroom teacher becomes even more important. Schools in the informal settlements and the low-income areas face the issue of underfunding and no access to professional counsellors. A study carried out in the Kiambu County that has similar urban aspects with Nairobi found out that HIV stigma and other psychosocial aspects have a considerable impact on the self-esteem of pupils in the public primary schools (Wambugu, 2023). Subsequently, teachers are left with almost all the responsibility of offering psychosocial services to the vulnerable learners. Thus, the years of service of a teacher and, consequently, his or her experience, becomes a proxy of his or her potential to provide not only academic but also emotional support to students.

Different education systems across the world have appreciated the role of teaching experience in emotional development of learners. Structured psychosocial support is proven to be important, and Life Skills Education programs have been reported to help adolescents in orphanages to enhance their emotional health and self-esteem (Mohammadzadeh et al., 2019). Special educational programs aimed at increasing self-esteem in orphaned children when provided by trained and experienced educators have been effective in its implementation, (Özturk & Ekinci, 2018). Moreover, the problem-based learning projects have also been considered as the ways to promote self-esteem among orphaned students (Latada & Hashim, 2023). The results of this study underscore the significance of teaching experience in fostering not only academic achievements, but also psychosocial growth of students.

The Government of Kenya has introduced several interventions aimed at improving educational access and retention for orphans and vulnerable children, including the Free Primary Education program, bursary schemes, and feeding programs. Although these have been useful in improving school enrollment, they have not directly been related to better emotional and psychological health of the orphaned students. The research studies conducted on orphaned students at Kenyan secondary schools have shown elevated rates of irrational beliefs and stress which demonstrate the existence of long-term psychosocial difficulties (Umija et al., 2021). Studies that focus on the socio-economic background of the orphaned students have established strong linkages between the status and the level of self-esteem in the students (Gatumu et al., 2010). This psychosocial support loophole has remained a significant issue in the education system of the country.

The Basic Education Act of 2013 requires schools to offer safe and inclusive learning environment to all children including orphans. Nevertheless, this has not usually been put into effect due to limited resources, insufficient training

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of teachers on matters dealing with psychosocial issues and the lack of monitoring systems. A survey conducted on the discipline management tactics used by principals in Makueni County determined that proper management tactic has critical impacts on the psychological health of the orphaned students (Muli, 2024). Therefore, lots of orphaned students still face the problem of low self-esteem, lack of academic interest, and lack of interest in school. These issues directly affect the potential of the learners to realize their potential, not only at school but also in general.

It is against this backdrop that this research paper aims to examine the connection between the teaching experience of the class teacher and the self-esteem of orphaned pupils in the public junior schools in Nairobi County. It is anticipated that the results of the research will guide the policy-making process and teacher-training programs by showing the importance of the teaching experience in the emotional and psychological support of the orphaned learners.

1.1 Statement of the Problem

According to UNICEF (2015), the population of orphans below the age of 18 years in Kenya stands at 3.6 million. These children require psychosocial support to develop positively and be like other children. Due to the loss of their parents, these children lack parental care, love, protection and the basic necessities. They are, therefore, likely to develop psychological issues such as low self-esteem, low self-efficacy and low self-actualization. Research has established significant differences in self-esteem between orphaned and non-orphaned students, with orphaned children exhibiting lower levels of psychological wellbeing (Kinyua & Gitumu, 2024; Shuja, 2023). These psychosocial challenges affect the educational achievement of learners. The school becomes the hope for learners in terms of providing them with psychosocial support. Teachers who are trained in psychosocial support are expected to provide the necessary support to the learners and help them to develop positively and achieve their life goals. However, studies indicate that teachers often lack confidence in their efficacy to effectively support orphaned learners (Setai, 2023). In many cases, teachers are not prepared to deal with the psychosocial challenges of orphaned learners. This is likely to affect their achievement in school.

Research observes that in Nairobi County, the number of orphaned learners is increasing every year and there has not been enough effort to prepare the teachers to handle the psychological issues of these learners. Orphaned learners experience psychosocial challenges that affect their academic achievement. Studies conducted in similar urban settings have documented high levels of stress and psychological distress among orphaned students (Umija et al., 2021; Wambugu, 2023). These challenges include aggression, stress, low self-esteem and low self-confidence. The class teacher is the person who can offer the necessary psychosocial support. The teacher should be able to recognize learners who have challenges and give them the necessary support. The question is whether the teachers were prepared and able to deal with these challenges and provide the necessary support to the learners. This study, therefore, aimed at establishing whether class teacher's teaching experience has an influence on the psychological wellbeing of orphaned learners as indicated by their self-esteem.

1.2 Research Objective

To investigate the relationship between class teacher's teaching experience and the self-esteem of orphaned pupils in Public Junior Schools of Nairobi County, Kenya.

1.3 Research Hypothesis

*H*o$_1$*:* There is no relationship between class teacher's teaching experience and the self-esteem of orphaned pupils in Public Junior Schools of Nairobi County, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

The study was grounded on three theories: the Self-Esteem Theory by Rosenberg (1965), the Social Learning Theory by Bandura (1977), and the Self-Determination Theory by Deci and Ryan (1985). These theories provide the foundational basis for understanding the influence of class teachers' teaching experience on the self-esteem of orphaned pupils.

According to Rosenberg (1965), self-esteem is a positive or negative attitude towards oneself. He argued that self-esteem involves a person's overall sense of self-worth or personal value. Rosenberg assumes that self-esteem is created by the interactions that individuals have with their environment and the feedback they get through teachers and other key people in their lives. A learner who has high-self-esteem is likely to have a positive perception of himself/ herself whereas a learner with low-self-esteem will feel insecure, inadequate, and uncertain. School life, particularly in case of orphaned students can largely influence the way such students perceive themselves regarding their interaction with the teachers. It has been established that educational interventions are important in structuring the educational programs which can greatly enhance self-esteem of individuals in institutional care settings (Özturk & Ekinci, 2018). Emphatic, praiseful, and supportive feedback can also be used by teachers to ensure that vulnerable learners have high

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self-esteem. The theory is in tandem with the present study since it shows how the experience of teaching can impact on the manner in which teachers engage and react to emotional needs of orphaned students.

The Social Learning Theory developed by Bandura (1977) focuses on how observational learning, imitation and modelling contribute to the development of behavior and psychological growth. According to the theory, people and especially children learn by watching the behavior of the role models and copying them. Bandura also observed that learning occurs through cognitive processes implying that learners are not passive receivers of stimuli but rather they are active in the interpretation and internalization of modeled behavior. The orphaned learners, in the classroom setting, can turn to their teachers to find support in terms of emotional stability, confidence, and guidance. Teachers who are positively-behaved, confident, and emotionally supportive are able to become effective role models. Research has demonstrated that the connectedness of teachers and positive modeling have a great impact on the resilience of orphaned adolescents (Akilandeswari & Annalakshmi, 2023). Seasoned teachers will tend to be more likely to have such attributes since they have been exposed to a variety of needs of learners over a long period. Therefore, the experience in teaching can determine the amount of teacher that can become the best model to help the orphaned learners to develop self-esteem.

The Self-Determination Theory (SDT) created by Deci and Ryan (1985) concentrates on the intrinsic motivation of a person and the psychological needs that are supposed to be met to facilitate productive learning and development. Such needs are autonomy, competence and relatedness. When the needs are addressed, chances are high that the learners will enjoy psychological well-being, motivation, and high self-esteem. Ryan and Deci (2000) note that teachers have a significant role to play to foster such needs, in the form of the learning environment. Seasoned teachers can be more suitable to assist the learners with their autonomy, develop their competence through positive feedback, and enhance meaningful teacher-learner relationships. In case of orphaned pupils, who might not have support at home, the ability of a teacher to attend to these psychological needs is important to the self-esteem and general growth of such children. It has been established that interventions, which fulfill these basic psychological needs, substantially enhance emotional health and self-esteem in adolescents in an orphanage (Mohammadzadeh et al., 2019). This theory hence justifies the idea that teaching experience of class teachers has much influence in the development of psychological well-being of orphaned learners.

2.2 Empirical Review

Studies conducted in various countries have explored how teaching experience influences learner outcomes, including psychological well-being. The role of the teacher, particularly the class teacher, in shaping self-esteem among vulnerable learners such as orphans, has been of interest to many scholars.

Gatumu et al. (2010) developed a study on the self-esteem of orphan students and their connection with socio-economic status in secondary school students in three central Kenya districts. In the research, it was found that the self-esteem of the orphaned students was very low as compared to their non-orphaned counterparts. The results showed that socio-economic status, together with the quality of support that the orphaned learners were given by teachers and other adults in the educational setting, was very crucial in defining the level of self-esteem among the orphaned learners. The researchers in the study stressed that more experienced and empathetic teachers were in better situations to identify the emotional needs of orphaned students and respond to them.

A more recent investigation by Kinyua and Gitumu (2024) involved the analysis of the degree of self-esteem among orphan and non-orphan learners by secondary schools in both Kirinyaga and Nyeri Counties in Kenya. The research established that significant disparities existed in the levels of self-esteem, and orphaned students always reported a lower state of self-worth and confidence. The study emphasized that teacher to student relationship and the degree of individualized attention by the experienced teachers were crucial in enhancing the psychological wellbeing of orphaned students. The research concluded that teacher experience played a major role in boosting the self-esteem of orphaned students in the secondary schools.

Setai (2023) explored the views of teachers toward their effectiveness in teaching learners who were orphans in Maseru Secondary Schools in Lesotho. The researchers found that teachers who had greater teaching experiences were more assured and capable of meeting the psychosocial needs of the orphaned students. These educators were more conscious about the emotional issues of orphaned students and more proactive in adopting the supportive strategies. The researchers established that the senior teachers were more tolerant, sensitive and effective in instilling trust among orphaned students. These were teachers who provided good classroom conditions, which facilitated self-expression, acceptance by peers, and the feeling of self-worth. The study underscored that novice teachers were not always confident and able to address the emotional needs of vulnerable students.

Shuja (2023) conducted a comparative study to investigate the academic performance, happiness, and self-esteem of the orphan and non-orphan children in Pakistan in terms of gender and type of institution. The findings indicated that orphaned children exhibited considerably low self-esteem and happiness with respect to non-orphaned ones. The study also observed that quality of adult supervision and mentorship in learning institutions was also critical

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in moderating these differences. The psychological outcome of the orphaned children was better in institutions that had long time experienced staff who offered a steady emotional support and structured guidance.

A study that was carried out in Malaysia examined project-based learning (POPBL) that was problem-oriented as an intervention program to improve the self-esteem of orphans. Latada and Hashim (2023) established that organized learning programs, when performed by highly trained and qualified teachers, were of great importance in enhancing self-confidence, as well as self-worth, of orphaned children. The research indicated that more successful in designing and implementing such interventions were teachers who had the pedagogical experience since they were more aware of the needs of learners and adaptive teaching strategies.

The study by Özturk and Ekinci (2018) in Turkey was focused on the impact of structured education on self-esteem and suicide probability in male adolescents placed in orphanages. The results indicated that guided learning programs run by skilled teachers had a dramatic effect as it enhanced self-esteem level and minimized adverse psychological consequences. According to the study, more trained teachers showed higher abilities to provide safe and accommodative learning environments, which were responsive to the emotional weaknesses of the institutionalized children.

In Malaysia, a multi-center randomized control trial study by Mohammadzadeh et al. (2019) compared the efficacy of Life Skills Education programs in enhancing the emotional health and the self-esteem of adolescents residing in the orphanage. The findings also indicated that clear psychosocial programs conducted by trained and qualified facilitators greatly boosted self-esteem and emotional wellbeing. The researchers have highlighted the significance of experience and training of a facilitator in providing effective psychosocial support to vulnerable adolescents.

Wambugu (2023) in Kenya carried out an evaluation of the impacts of HIV-related stigma to the self-esteem of pupils in public primary schools in Kiambu County in Kenya. According to the research findings, stigma was identified as a major hindrance to the self-esteem of the affected pupils though supportive interactions with the teachers were identified as protective factors. The teachers who had a longer experience were identified to be more sensitive to the stigmatization of vulnerable pupils as well as being more effective in establishing inclusive classroom settings that encouraged self-worth and dignity.

Umija et al. (2021) investigated the level of irrational beliefs and stress, among Kenyan secondary school orphaned students. It was found that orphaned students were more affected because of the stress and irrational beliefs. The paper has highlighted that educator and especially those who have been experienced in counseling and psychosocial provision were very important in refuting such irrational beliefs and offering emotional advice that facilitated resilience and well-perceived self-image.

Muli (2024) examined how the management strategies of principals on discipline enforced on orphaned children in state secondary schools in Makueni County, Kenya, affect the psychological wellbeing of these students. The researcher established that the use of supportive and restorative methods of discipline, which experienced school leaders and teachers tend to use most frequently, was related to the increase in the levels of self-esteem and emotional stability of the learner among the orphans. The study found that professional teachers tended to be more willing to implement discipline measures that accounted on the emotional impact of orphaned children than those that are discipline based and which may harm the attitude of the students.

A comparative study by Akilandeswari and Annalakshmi (2023) was carried out in India to determine the role of alienation, educational aspiration, and teacher connectedness on resilience in orphan and non-orphan adolescents. The results showed that teacher connectedness was a strong predictor of resilience and self-esteem by orphaned adolescents. Students who indicated strong relationship with their teachers, especially those whose teachers had taught them over a long time showed better levels of psychological wellbeing and academic motivation.

Lemeyu et al. (2023) researched the experiences of orphans and vulnerable children (OVC) in public primary schools in the city of Harare in Zimbabwe. Teacher interaction is one of the key factors the study determined to affect the self-esteem and engagement of the learners at school. It observed that the senior teachers developed organized schedules, articulated expectations, and respected relationships with the learners. These are the factors that led to higher self-esteem by orphaned pupils. The paper has also pointed out that inexperienced teachers tended to use punitive approaches and could not relate well with emotionally vulnerable students.

Abraha (2024) investigated psychosocial experiences of orphan children in primary school in Ethiopia, including issues and mitigation. The researchers established that orphans had serious psychological issues such as low self-esteem, anxiety, and social withdrawal. But the study made the observation that psychological outcomes were greatly enhanced by supportive efforts of experienced teachers and school-based counselors. The paper has highlighted that more experienced teachers were more placed to recognize the initial signs of mental distress and make the right support or referral.

In spite of the fact that a few studies have highlighted the role of teacher qualities on the psychological growth of learners, a majority of them have concentrated on general population or other performance dimensions like academic attainment or conduct. There have been limited studies which specifically looked at the correlation between teaching

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experience of class teachers and the self-esteem of the orphaned students in the public junior schools in Nairobi County. The present study aims at filling this gap by offering a local evidence based information.

Based on the reviewed literature, teaching experience has an enormous impact on the psychological development of learners, in particular, emotional stability, self-worth, and self-confidence. The conceptual models including Rosenberg Self-Esteem Theory, Social Learning Theory developed by Bandura, and Self-Determination Theory of Deci and Ryan all prove that interactions with important adults, particularly teachers, affect self-esteem of learners.

Empirical research in Kenya, Pakistan, Malaysia, Turkey, India, Zimbabwe and Ethiopia show that experienced teachers are crucial towards offering emotional support, modeling positive behavior and inclusive classroom environments. The latter characteristics apply particularly to the case of orphaned pupils who usually have no support of their parents and are more vulnerable to emotional difficulties.

Nevertheless, literature has a clear gap when it comes to the direct correlation between the teaching experience of the class teachers and the self-esteem of orphaned students in the public junior schools in the Nairobi County. The majority of the available research is generalized or carried out in other institutions of learning. This research therefore fills this gap of knowledge by paying attention to the role of a teaching experience of the class teachers in affecting the self-esteem of the orphaned students in urban setting of Nairobi County in Kenya.

III. METHODOLOGY

This study employed a descriptive correlational research design to determine the relationship between class teacher teaching experience and the self-esteem of orphaned pupils. The design was considered appropriate as it allows for the establishment of relationships among variables without manipulating them. The study was carried out in Nairobi County, Kenya, and targeted a population of 192,113 orphaned learners drawn from 237 public junior schools. The accessible population included orphaned pupils and their class teachers in grades 7, 8, and 9. The sample size comprised 400 orphaned pupils and their class teachers, selected using purposive sampling techniques. Data were collected using structured questionnaires administered to both pupils and their class teachers. The pupil questionnaire was designed to measure the self-esteem, while the class teacher's questionnaire focused on demographic characteristics, including the teaching experience. The data collection instruments were pilot tested in a school outside the main study area to assess their reliability and validity. The reliability coefficient (Cronbach's Alpha) was found to be 0.784, which was considered acceptable for the study.

Quantitative data were analyzed using both descriptive and inferential statistics. Descriptive statistics such as frequencies, means, and percentages were used to summarize the data. To test the hypotheses, Pearson's Product Moment Correlation Coefficient was used to determine the relationship between the independent variables (teacher's teaching experience) and the dependent variable (self -esteem of orphaned pupils). Statistical analysis was facilitated by the use of Statistical Package for Social Sciences (SPSS). Ethical considerations were upheld throughout the study. The researcher obtained permission from the relevant education authorities and ensured that informed consent was obtained from all participants. Anonymity and confidentiality of the participants were guaranteed, and participation was voluntary. The research process was also guided by logistical preparations, including scheduling appointments with school heads.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The respondents who participated in this study included class teachers and orphaned pupils in public junior schools in Nairobi County. Specifically, the researcher targeted 400 orphaned pupils and their class teachers. A total of 579 questionnaires were successfully returned: 179 from class teachers and 400 from orphaned pupils. This data is presented in Table 1.

Table 1

Questionnaire Return Rate

Respondents	Sample	Returned	Return Rate
Class Teachers	200	179	89.5%
Orphaned Pupils	400	400	100%
Total	**600**	**579**	**96.5%**

The return rate of 96.5% is considered very good as it exceeds the 70% threshold recommended by Mugenda and Mugenda (2003) for reliable data analysis and generalization. This high response rate enhances the credibility of the findings and the representativeness of the sample.

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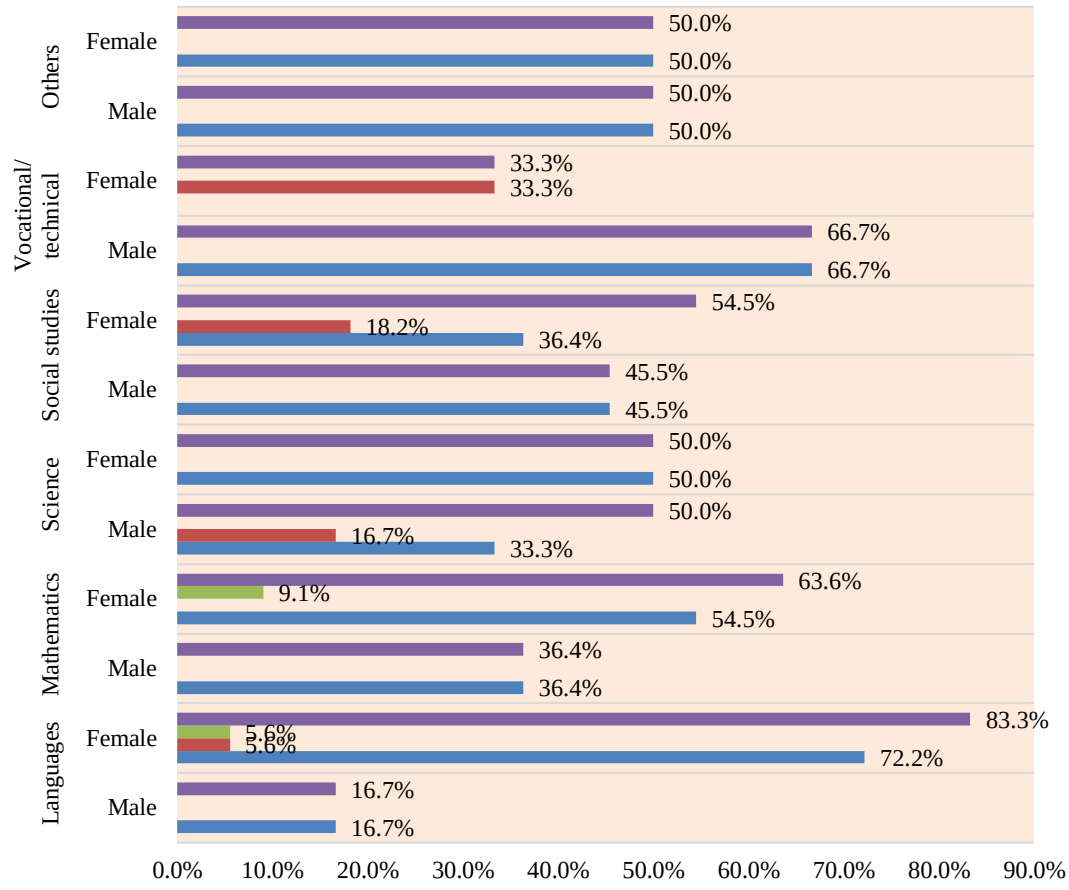
4.1.1 Class Teachers' Teaching Experience

The study sought to determine the distribution of teaching experience among class teachers in public junior schools. Respondents were asked to indicate their total years of teaching experience.



	Languages		Mathematics		Science		Social studies		Vocational/ technical		Others	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
% Total Within Gender & Subjects Taught	16.7%	83.3%	36.4%	63.6%	50.0%	50.0%	45.5%	54.5%	66.7%	33.3%	50.0%	50.0%
20 years and above		5.6%		9.1%								
6-10 years		5.6%			16.7%			18.2%		33.3%		
1-5 years	16.7%	72.2%	36.4%	54.5%	33.3%	50.0%	45.5%	36.4%	66.7%		50.0%	50.0%

Figure 1

Distribution of Teacher Respondents by Gender, Teaching Experience and Subject Taught

This chart illustrates the distribution of teachers' teaching experience across different subjects by gender. The data reveals that the majority of teachers, regardless of gender or subject area, have 1-5 years of teaching experience, with particularly high concentrations in Languages (72.2% female, 16.7% male) and Mathematics (63.6% total). Teachers with 6-10 years of experience represent a smaller proportion, most notably in vocational/technical subjects (33.3%). Remarkably, only two instances show teachers with 20+ years of experience (5.6% in Languages and 9.1% in Mathematics), indicating a predominantly young or less-experienced teaching workforce.

4.1.2 Self-Esteem Levels of Orphaned Pupils

Figure 2 shows the connection between the living status of the orphaned pupils, the parental status and the level of self-esteem.

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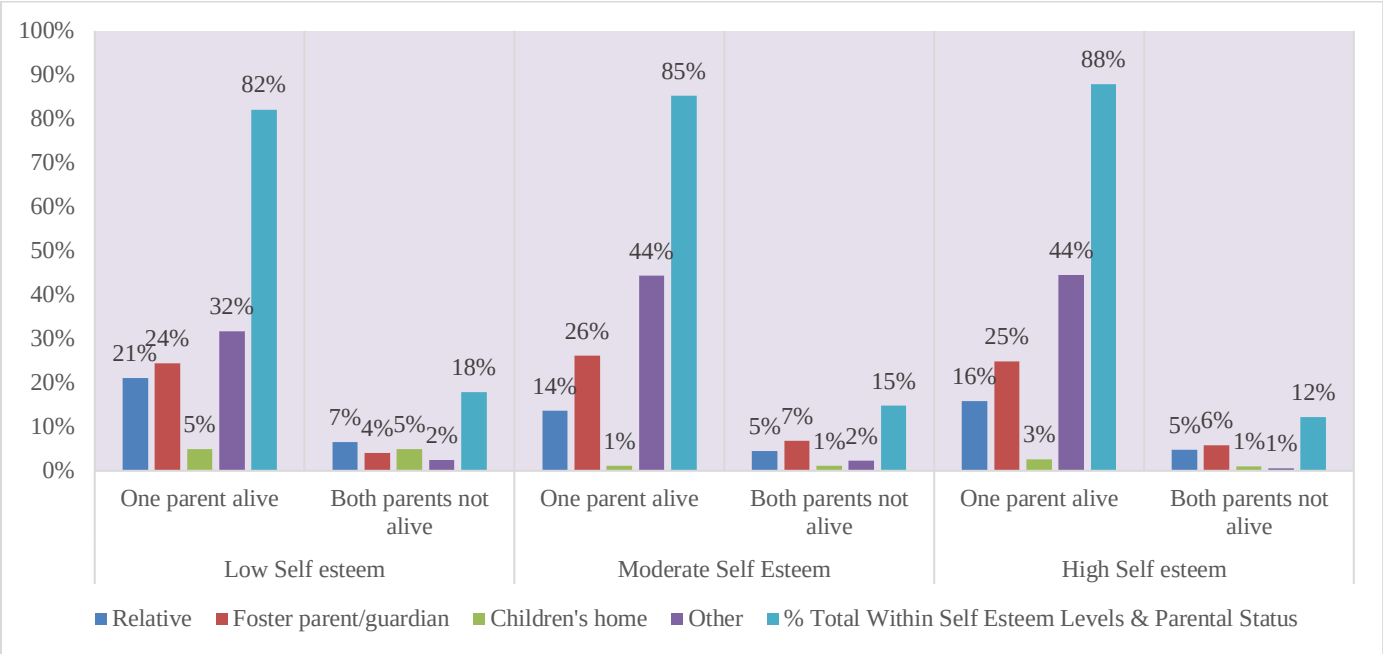

Figure 2

Distribution of Student Respondents by Parental Status, Living Categories and Self Esteem Levels

The statistics in Figure 2 indicate dangerous trends: only 82 percent of students who had one parent alive and 85 percent of those who had both parents dead had low or moderate self-esteem, and only 88 percent of students had high self-esteem. It is also interesting to note that the group of pupils who live with relatives has the highest percentage (21% low, 14% moderate, 16% high), and pupils in the children homes have the least percentage (5% low, 1% moderate, 3% high). Always worrisome are the trends of double orphans (both parents are dead), whereby there is a high representation in low self-esteem. Different results are observed in foster parents/guardians who take care of orphaned children (24% low, 26% moderate, 25% high self-esteem), which explains the role of caregivers in seriously affecting psychological wellbeing. Such results drive home the frailty of orphaned pupils irrespective of their living conditions, the importance of teacher assistance in fostering self-esteem among this group of people

4.1.3 Relationship between Class Teachers' Teaching Experience and Pupils' Self-Esteem

To test the hypothesis that there is no significant relationship between class teachers' teaching experience and the self-esteem of orphaned pupils, the researcher used Pearson's Product Moment Correlation.

Table 2

Teachers Ratings of Orphaned Children Self Esteem

Statistics		
Teachers Ratings Of Students Self Esteem Scale Scores		
N	Valid	30
	Missing	0
Mean		80.8667
Median		81.5000
Mode		80.00[a]
Std. Deviation		8.22835
Variance		67.706
Skewness		-.615
Range		34.00
Minimum		60.00
Maximum		94.00
Percentiles	25	77.0000
	50	81.5000
	75	86.7500
A. Multiple Modes Exist. The Smallest Value Is Shown		

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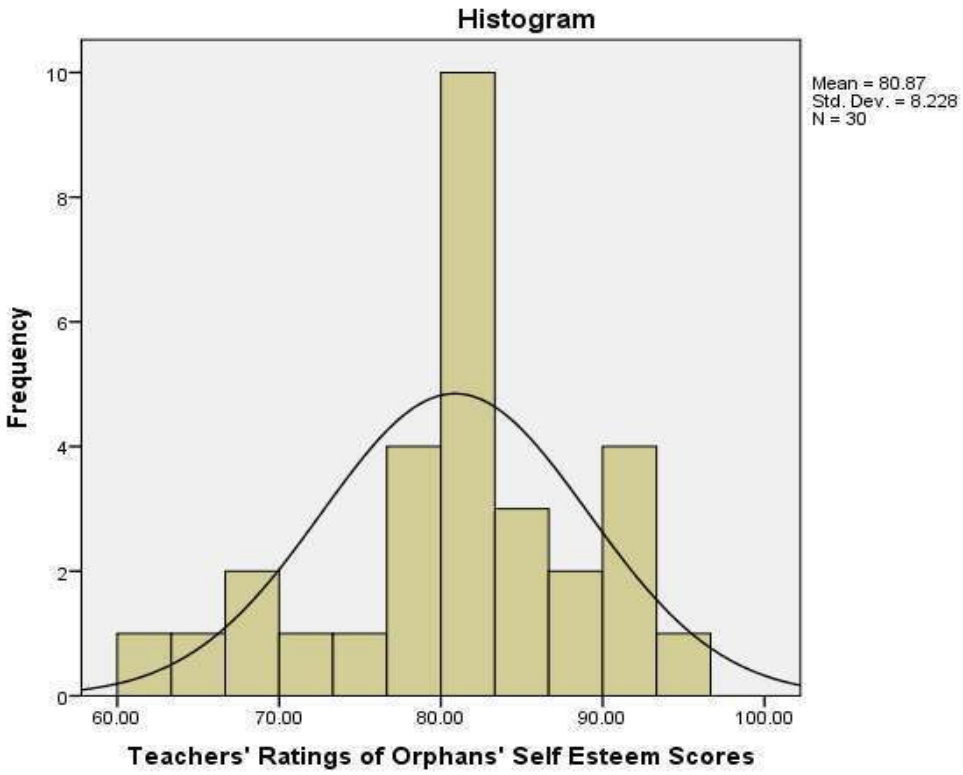

Figure 3
Teachers' Ratings of Orphaned Children Self Esteem Histogram

The results presented in Table 2 and Figure 3 reflect teachers' perceptions of the self-esteem levels of orphaned students under their care. The data was based on valid responses from 30 teachers, with no missing values. The mean score for teacher ratings was 80.87 with a standard deviation of 8.23, indicating that, overall, teachers viewed the orphaned students as possessing relatively high levels of self-esteem. The median score was 81.50, while the mode was 80.00, showing consistency around the central tendency. The range between the highest (94) and lowest (60) scores was 34, suggesting that while teachers generally reported high self-esteem levels, they acknowledged some variation across individual students. The interquartile range from the 25th percentile (77.00) to the 75th percentile (86.75) further supports that most ratings clustered in the upper quartile of the scale. The skewness of -0.615 confirms a clear leftward (negative) skew in the distribution, indicating that most ratings leaned toward the higher end of the self-esteem scale. Figure 3 visually affirms this, with the histogram showing a concentration of responses in the upper range. These findings suggest that teachers overwhelmingly perceive orphaned learners as resilient and emotionally stable.

The results indicate a moderate positive correlation ($r = 0.367$, $p < 0.01$), suggesting that higher levels of teaching experience are associated with higher levels of self-esteem among orphaned pupils. Therefore, the null hypothesis was rejected.

4.2 Discussion

The finding that most of the orphaned pupils have low to moderate self-esteem is consistent with recent research demonstrating significant differences in self-esteem levels between orphaned and non-orphaned students (Kinyua & Gitumu, 2024; Shuja, 2023). This emotional vulnerability in orphans is worsened by the absence of consistent adult support and parental care. In this situation, the class teacher is most likely the one to have the emotional and psychological support responsibility. This paper has established that the more experienced teachers help to bridge this gap by designing systematic classroom practices, verbal affirmation and individual attention. These measures are helpful in creating a stable and supportive environment to orphaned students that later facilitates building self-esteem and a sense of belonging, which was seen in other researches on teacher efficacy in dealing with vulnerable students (Setai, 2023).

The fact that the positive correlation between teaching experience and the self-esteem of the pupils found in this study is valid confirms the assertion of the Self-Determination Theory by Ryan and Deci (2000) which contends that the pillars of psychological well-being are relatedness and competence. The veteran teachers with their interpersonal maturity as well as broad exposure to the needs of the different learners are better placed to facilitate the influence of these two interrelated dimensions on the vulnerable pupils. They create a feeling of belonging to classrooms that not

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only help pupils become visible and audible, but also capable and worthy. This conclusion is justified by the studies that have shown that the self-esteem and emotional well-being of adolescents in institutional care are significantly improved by the help of structured interventions provided by the experienced educators (Mohammadzadeh et al., 2019; Özturk & Ekinci, 2018).

This brings out the emotional nature of teaching which is more important in the case of orphaned children. It has been a consistent finding that teacher connectedness is a great predictor of resilience and psychological wellbeing in orphaned adolescents (Akilandeswari & Annalakshmi, 2023). The teachers who have been teaching in the classroom over a long period are more prone to identify the needs of their students that are not fulfilled. They pick up slightest indications such as withdrawal, restlessness, mood swings, and they often have informal arrangements such as check-ins during breaks to assist struggling pupils with emotional problems. These are the kinds of emotional literacy that are likely to be developed over time that appear to play a vital role in helping the students who are orphaned to grow with better self-esteem.

In Nairobi, the school environment, which is generally an urban environment, individual attention is a luxury since in most cases the teacher is supposed to attend to a huge number of students in a classroom. Nonetheless, this research showed that the longer the teacher had been teaching the more competent he or she was in identifying students in need of help and making effective use of time to offer emotional support. This favors the virtue of relational capital that will accrue to the experienced teachers over time. They know how to strike a balance between delivery of content and emotional care. Research in a similar urban setting established that senior teachers can better assist in solving psychosocial problems, including those associated with stigma which impacts on self-esteem (Wambugu, 2023). This means that the orphaned students they take in feel better and they will most likely come out successfully in the social and emotional front despite their conditions.

Further, the findings also confirm the hypothesis that teaching experience increases the advancement of adaptive classroom strategies, especially on socio-emotional aspects. Veteran teachers being experienced in the field of both behavioral and academic concerns are better equipped to recognize the instances of emotional distress, implement the responsive classroom management and participate in the empathy-based pedagogy. This fact aligns with a study in Zimbabwe that demonstrated that veteran teachers establish routines and develop respectful relationships that help to build better self-esteem in orphaned students (Lemeyu et al., 2023). On the other hand, the more recent teachers may be more obsessed with the content of the syllabus, marking, and performance scores which may be disruptive of their ability to engage the pupils on a personal level. This might be the cause of such a shift in priorities as orphaned pupils proved to be more self-esteemed with teachers who were more experienced under their care.

The data indicate that emotional support cannot be replaced by curriculum content or institutional policies. It is human touch that has decisive role in shaping the psychological perspective of the child especially by the steadfast influence of an adult in the school. This research article contributes to the literature that schools should be concerned about teacher preparation and emotional intelligence and specifically among teachers who teach vulnerable populations. Research on the discipline management techniques has revealed that seasoned teachers who use supportive styles can play a critical role in the psychological wellbeing of orphaned students (Muli, 2024). It is not only the experienced teachers who should educate pupils in academic matters but act as role-models of resilience, compassion, and emotional control, which orphans might not acquire at home.

Besides, previously taught teachers are more successful in facilitating peer relations, participation in group activities, and inclusion in a classroom. Having more developed knowledge of class dynamics, they are able to build the community and create cooperation among pupils. This can be especially applicable to orphaned students who usually feel isolated, unworthy, or afraid of being rejected (Abraha, 2024). When their teachers in the classroom create emotionally safe spaces, such learners become more likely to engage, speak up and feel validated. As well, veteran educators can make referrals to vulnerable students to school counseling offices and in some cases even initiate informal mentoring programs. Their information on the processes and resources present in the institution makes them be able to advocate for the students who need psychological interventions. Studies have shown that these supportive interventions help a great deal to decrease stress and irrational beliefs in orphaned students (Umija et al., 2021). This is the conclusion that brings out the forms of transformation in which a supportive teacher can transform the life of an orphaned child. It validates that the psychological wellbeing at school is not a mere product of policies and infrastructure, but a product of relationships, primarily, the relationship between the pupil and the teacher. This relational focus is especially critical at public schools in Kenya, where the material resources might be scarce, yet interaction between a person can be an effective tool of positive transformation.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The purpose of this study was to investigate the relationship between class teachers' teaching experience and the self-esteem of orphaned pupils in public junior schools in Nairobi County, Kenya. The quantitative analysis revealed a

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statistically significant positive correlation between teachers' years of teaching experience and the self-esteem levels of orphaned pupils (χ^2 = 169.93, p = 0.009), leading to the rejection of the null hypothesis. Pupils taught by more experienced teachers reported higher levels of self-confidence, belonging, and classroom engagement. The study's conclusions emphasize the role of significant adult figures in shaping learner's self-worth. In summary, the study concludes that teaching experience significantly influences the self-esteem of orphaned pupils, with more experienced teachers better positioned to provide the emotional stability, psychosocial guidance, and nurturing environment required to build resilience and confidence among orphaned learners in Nairobi County.

5.2 Recommendations

Based on the findings and conclusion, the study makes the following recommendations:

The Ministry of Education and the Teachers Service Commission (TSC) should strengthen in-service training programs focusing on psychosocial support and emotional intelligence. Such programs should target newly recruited teachers, equipping them with skills to identify emotional distress, manage vulnerable learners, and provide trauma-informed support. Schools should establish mentorship systems pairing less experienced teachers with seasoned educators. Through this structure, novice teachers can learn best practices in handling psychosocial challenges from their senior colleagues.

Education policy makers should consider teaching experience as a factor in class allocation. Vulnerable groups such as orphans should be placed under the guidance of more experienced teachers to ensure that their psychosocial needs are met alongside academic instruction. Schools should integrate professional guidance and counseling units to complement the support given by class teachers. Teacher-counselors should be provided with ongoing training and resources to enhance their capacity to serve orphaned pupils. The Government of Kenya, in collaboration with NGOs, should prioritize the provision of psychosocial support programs within schools, including life skills education, peer counseling, and mentorship activities. Such initiatives will supplement the work of class teachers in building self-esteem among orphaned pupils.

REFERENCES

Abraha, B. (2024). The psychosocial experiences of orphan children in primary education: Challenges and interventions. *European International Journal of Pedagogics*, *4*(12), 1–7. https://inlibrary.uz/index.php/eijp/article/view/57690

Akilandeswari, M., & Annalakshmi, N. (2023). Influence of alienation, educational aspiration, and teacher connectedness on resilience among orphan and non-orphan adolescents: A comparative study. *Indian Journal of Positive Psychology*, *14*(3), 259–266.

Bandura, A. (1977). *Social learning theory*. Prentice Hall.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. Plenum Press.

Gatumu, H. N., Gitumu, M. W., & Oyugi, E. O. (2010). Orphan students' self-esteem and their relationship between socio-economic status among secondary school students in three districts of central Kenya. *J Soc Psychol Anthropol Pract*, *2*, 1–8. https://academia.edu/download/96510446/orphan_20students_20self-esteem.pdf

Kinyua, J. N., & Gitumu, M. W. (2024). The level of self-esteem between orphan and non-orphan students among secondary schools in Kirinyaga and Nyeri counties in Kenya. *Journal of Frontiers in Humanities and Social Sciences*, *2*(1), 62–72. https://blueprintacademicpublishers.com/index.php/JOFHSCS/article/view/88

Latada, F., & Hashim, H. (2023, December). Project-oriented problem based learning (POPBL): An initiative to enhance self-esteem among orphans. *International Journal of Modern Education, 5*(19), 178–190. https://doi.org/10.35631/IJMOE.519013

Lemeyu, T., Goshomi, U., & Chikutuma, T. (2023). Exploring experiences encountered by orphans and vulnerable children (OVC) in public primary schools in Harare, Zimbabwe. *Indiana Journal of Humanities and Social Sciences*, *4*(6), 6–13. https://doi.org/10.5281/zenodo.8123063

Maslow, A. H. (1970). *Motivation and personality* (2nd ed.). Harper & Row.

Mohammadzadeh, M., Awang, H., Ismail, S., & Kadir Shahar, H. (2019). Improving emotional health and self-esteem of Malaysian adolescents living in orphanages through Life Skills Education program: A multi-centre randomized control trial. *PloS One*, *14*(12), e0226333. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0226333

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods, quantitative and qualitative approaches*. ACT.

Muli, W. S. (2024). Influence of principals' discipline management strategies on psychological well-being of orphaned students in public secondary schools in Makueni County, Kenya (Doctoral dissertation). http://41.89.101.166:8080/handle/123456789/17416

Omondi, A. (2020). Support systems and psychological well-being of orphaned students in Makueni, Kenya. *Child and Adolescent Social Work Journal, 37*(5), 523–539.

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Öztürk, Ş., & Ekinci, M. (2018). The effect of structured education on self-esteem and the suicide probability of male adolescents living in orphanages. *Archives of Psychiatric Nursing, 32*(4), 604–609. https://www.sciencedirect.com/science/article/abs/pii/S088394171730451X

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68–78.

Setai, T. I. (2023). Teachers' perceptions of their efficacy in teaching orphaned learners in Maseru secondary schools (Master's thesis, National University of Lesotho).

Shuja, K. H. (2023). A complex model of differences on gender and institution type in academic achievement, happiness and self-esteem among orphan and nonorphan children from Pakistan. *Current Psychology, 42*(13), 10588–10602. https://link.springer.com/article/10.1007/s12144-021-02283-5

Umija, M. A., Aloka, P. J., & Wachianga, W. O. (2021). Irrational beliefs and stress levels: Evidence among orphaned students in Kenyan secondary schools. *South African Journal of Education, 41*(2), S1–S11. https://www.ajol.info/index.php/saje/article/view/225071

UNICEF. (2015). *The state of the world's children 2015: Reimagine the future: Innovation for every child*. https://www.unicef.org/reports/state-worlds-children-2015

Wambugu, J. W. (2023). Assessment of the effects of HIV related stigma on self-esteem of pupils in public primary schools in Kiambu County [Master's thesis, Kenya Methodist University].

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Unmanned aerial systems (UAS) in modern peacekeeping operations: Applications, challenges, and future directions

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ABSTRACT

The study examines how Unmanned Aerial Systems (UAS) can be integrated into modern peacekeeping missions and their strategic importance, paying special attention to the prospects of using UAS in African-based missions, including the United Nations Mission in South Sudan [UNMISS], the United Nations Organization Stabilisation Mission in the Democratic Republic of Congo [MONUSCO], the United Nations Multidimensional Integrated Stabilisation Mission in the Central African Republic [MINUSCA], and the African Support Stabilisation Mission in Somalia [AUSSOM]. It addresses the usefulness of UAS in intelligence, surveillance, and reconnaissance (ISR); humanitarian logistics; early warning systems; protection of civilians; and operational assistance in complex conflicts. The following three objectives informed the study: to review the uses of UAS in contemporary peacekeeping operations, to list and evaluate the issues involved in using such tools, and to understand the possibilities of the practical and ethical application of such tools in peace operations in the future. The basis of the study was technological determination and sociotechnical system theory. Both qualitative and quantitative case studies were implemented as a methodology, and the researcher has excluded the use of secondary missions where drones will be deployed. Data collection comprised document analysis, semi-structured interviews, and focused engagement with peacekeeping personnel, mission planners, and subject-matter experts. A lot of literature and mission reports were used to obtain secondary data. The data was analysed through thematic content analysis. Based on the evidence, although UAS has significantly improved situation awareness, responsiveness, and safeguarding of civilians, it is still constrained by the political opposition, legal evasiveness, regulation issues, and reluctant acceptance of the host state. The paper concludes that the future of UAS in peacekeeping lies in the development of transparent structures, inter-agency collaboration, investments in operations and the training of drone operators, and adherence to the use of UAS with ethical and trade laws to make the latter appear legitimate and trusted among the locals. The paper presents the necessity of developing uniformity in deploying UAS, the engagement strategy with the host nation, and the expansion of the technical infrastructure to allow for the enduring habits of drone integration during missions.

Keywords: Civilian Protection, Conflict Zones, Humanitarian Support, Peacekeeping Missions, Sociotechnical Systems Theory, Surveillance, Technological Determinism, Unmanned Aerial Systems (UAS)

I. INTRODUCTION

The current use of Unmanned Aerial Systems (UASs) in conflict resolution and peacekeeping missions highlights the evolution of similar mandates in conflict zones (Ladsous, 2023). The diversity, wide range of applications, and enhanced capacities have given missions an advantage in acquiring and gathering intelligence, conducting logistics and supply, and distributing humanitarian aid by having significant monitoring mechanisms.

In the past, UASs were only used in surveillance systems. Nevertheless, their usage has been changed with a string of improvements over the years, which became possible due to technological advances (Military Knowledge Base, 2025). UAS can now offer services in many different domains, such as intelligence surveillance and reconnaissance (ISR), cargo, and disaster relief. UAS have also been used more frequently in support of military and humanitarian operations, where the increased effectiveness in operating within the complex environment can be attributed to both the autonomous functionality of the UAS and the capability to carry heavier loads. This paper will discuss the application of UAS in peacekeeping and their likely future use in this dimension, alongside the challenges that they present and contribute to peacekeeping activities and the success of the missions, in general.

The research documents the Unmanned Aerial Systems (UAS) as the independent factor, whereby their strategic use-application in surveillance, logistics, and humanitarian aid is examined in the context of Yakodyne peacekeeping situations. The dependent variable is the effectiveness and success of peacekeeping operations, which is assessed through improved situation awareness, effective functioning, and the attainment of missions. To develop evidence-based

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frameworks that inform future interventions, understanding how UAS is linked to the effectiveness of any peacekeeping operation is essential.

The existing theoretical analyses have emphasized the potential use of UAS in conflict territories. However, most commonly lack a complete assessment of their consequences on state sovereignty, moral issues, and institutional assimilation (Finn & Wright, 2021). Although much literature exists regarding the strategic use of drones on the battlefield, peacekeeping missions- usually more multilateral, weak states, and humanitarian-conscious undertakings- present a distinct group of challenges. As such, this paper fills a significant gap in the literature by investigating the role of UAS in multinational peace operations, particularly concerning ethical and political aspects.

Furthermore, a more refined framework is needed on how these host countries feel about the utilization of drones, especially on surveillance and data collection issues, as it poses a threat to the sovereignty of the state and privacy (Williams & Smith, 2022). Also, poor standards of deployment, poor training of the peacekeepers, as well as unclear legal provisions have led to operational fragmentation. Such an interdisciplinary approach is expected to help fill these gaps through a non-exhaustive combination of technological, legal, political, and humanitarian angles, thereby introducing an interdisciplinary take on UAS integration into peacekeeping operations.

1.1 Statement of the Problem

UASs can efficiently contribute to intelligence gathering and supply chain management in peacekeeping missions. However, applications have been limited due to privacy issues, limited technology, privacy violations, and unaligned condonation among users (Small Wars Journal, 2023). Other, more recent missions, including UNMISS and MONUSCO, reflect the advantage of UAS and the political animosity that tends to thwart systematic application.

Although the purely technical capacity of UAS has gone through much investigation in military and humanitarian interventions (Boyle, 2020), there is little available research on the ethical and strategic value of UAS within multilateral peacekeeping operations. Articles like that by Finn and Wright (2021) has touched on drones in humanitarian applications, but has not elaborated on the consequences of political and coordination issues, and legal implications involved when deploying drones in peacekeeping operations. Because of this, the introduction of UAS in peace operations is rather unformatted and unassessed.

Lack of standardization of protocols, ethics, and institutional potential remains an obstacle to successful and wide-scale use of UAS in peacekeeping. Comparative research in varied mission contexts is necessary to comprehend the impacts of the political, cultural, and technological contexts on the UAS outcomes. Thus, this paper aims to address these gaps by exploring the social, political, technological, and operational obstacles to UAS usage and providing routes to maximize their tactical and ethical usage in contemporary peacekeeping operations

1.2 Research Objectives

i. To examine the strategic applications of UAS in modern peacekeeping missions.
ii. To identify the key operational, political, and ethical challenges associated with deploying UAS in missions.

II. LITERATURE REVIEW

2.1 Theoretical Review

Two theories guide the ideology of this study:

2.1.1 Technological Determinism Theory

The theory asserts that technological developments also cause changes in society and institutions. It explains that employing drones in peacekeeping is a logical extension of the technology, where the missions are updated. The proponents of this school of thought, such as Marshall McLuhan and Thorstein Veblen, argue that such technologies as UAS are never neutral, in the sense that they alter the fundamentals of the institutional behaviours, including protocols of engaging in military conflicts, and strategic decision-making (McLuhan, 1964).

This theory finds the main reasons why such adoption becomes the normal outcome of modern warfare patterns and the innovation cycle by elaborating the factors leading to the increased utilization of UAS in unstable war-torn areas (Williams & Smith, 2022). Due to the increasing complexity of the environment in which peacekeeping forces may work, the need for highly advanced surveillance and risk-mitigation technologies is also becoming undeniable.

Drones give the advantage of reviewing the engagement protocols, force protection approaches, and intelligence activities in reconstructing (Williams & Smith, 2022). Theorists, who confirmed their theories, e.g., Marshall McLuhan and Thorstein Veblen, emphasized that the implementation of new technologies often necessitates the subsequent advancement of the social structures, which is also observed in the way the UAS are transforming the principles of the execution of peacekeeping operations and modifying the approaches to those processes on the ground.

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2.1.2 Sociotechnical Systems Theory (STS)

Scholars, Eric Trist and Susan Leigh Star, developed the theory that considers technology and society as interdependent. In peacekeeping circumstances, STS is invaluable since organizing UAS in complicated systems, such as cultural norms, legal, personnel training, and organizational systems, is required (Trist & Bamforth, 1951; Davis et al., 2014). It takes up the how of responsible deployment and sees that drone integration aligns with local sensitivities, quality-driven operations, and professional ethics.

Regarding influential contributions to the deployment of UAS, STS can be beneficial in showing us how drones can be deployed responsibly, effectively, and ethically for peacekeeping use. It motivates mission planners and policy formators to consider interoperability with local and international players, the effects of surveillance on groups, and the possibility of its misuse or excessive use of technology (Trist, 1981). Systems scholars such as Erik Trist, Fred Emery, and Susan Leigh Star promote technologically and socially responsive systems. Within the UAS context, this constitutes the development of frameworks that ensure their utilization not only serves to improve but also does not compromise legitimacy, trust, and mission success.

2.2 Empirical Review

2.2.1 Strategic Importance of UAS in Peace Operations

UAS plays a strategic and significant role during peacekeeping. Peacekeepers can use their capabilities to control vast regions that are frequently inaccessible without jeopardizing human lives due to the possibility of their real-time surveillance and data collection abilities (Africa Intelligence, 2022; Dorn, 2023). UAS can enhance decision-making in volatile, unpredictable environments by equipping specific and timely intelligence (Dorn, 2023). They are also not likely to be present on the ground because of their ability to act in dangerous regions without automatic human interaction, enhancing the peacekeepers' security and safety.

Case Studies: UAS in Conflict Zones: UAS have proved helpful in the work of the United Nations Mission in South Sudan (UNMISS), United Nations Organization Stabilization Mission in the Democratic Republic of Congo (MONUSCO), United Nations Multidimensional Integrated Stabilization Mission in the Central African Republic (MINUSCA), and African Transition Mission in Somalia (ATMIS), now known as African Support Stabilisation Mission in Somalia (AUSSOM) (Dorn, 2023).

The Case of UNMISS: Unmanned aerial systems (UAS) have also acquired a very high degree of criticality in United Nations peacekeeping deployment through their capacity to create situational awareness, follow ceasefire violations, meet humanitarian needs, and ensure the safe passage of people. In the United Nations Mission in South Sudan (UNMISS), such air technologies can be beneficial when a country is at war, when the supply infrastructure is collapsed, and the residents are dispersed (Human Rights Watch, 2020). According to Ban Ki-moon, former UN Secretary General, deploying more helicopters and unmanned aerial vehicles (UAVs) to beef up peacekeeping operations and protect civilians in South Sudan is urgently needed (UN, 2013).

The mission has had serious political and operational problems despite the Security Council's authorization in 2014 to increase the number of UAVs and helicopters deployed to enhance the capacity of UNMISS. There has been much opposition to the deployment of drones by the South Sudanese government, mainly because of the fear of national sovereignty, misuse of the surveillance capacity, and poor consultations by the UN in South Sudan (Human Rights Watch, 2020). Ambassador Francis Mading Deng warned that such unilateral actions risked fostering mistrust and hostility towards peacekeepers, complicating cooperation essential for mission success (Africa Intelligence, 2022).

Operationally, UAS have demonstrated their value in South Sudan by conducting aerial surveys, delivering essential supplies, and facilitating safe transport across hazardous and inaccessible areas. Their ability to maintain persistent monitoring over conflict-prone regions enables UNMISS to detect ceasefire violations early, prevent escalations, and assist humanitarian actors in delivering aid where it is most needed. (Human Rights Watch, 2020). Beyond surveillance, drones have been adapted for remote sensing and even extending communications infrastructure, helping overcome challenges presented by poor or non-existent ground networks

The peacekeeping leadership, including former UN peacekeeping chief Hervé Ladsous, has emphasized that UAVs are indispensable tools for monitoring fragile ceasefires, providing early warnings to protect civilians, and ensuring the safety of peacekeepers (Africa Intelligence, 2022; UN, 2013). The integration of drones supports new peacekeeping mandates that demand rapid, informed responses to evolving threats in a complex and volatile environment. Without such technologies, UNMISS would struggle to effectively monitor dispersed armed groups and enforce peace agreements (Human Rights Watch, 2020).

Despite the clear operational benefits, using UAS in UNMISS remains a source of tension between the UN and South Sudan’s government. The latter has frequently resisted drone deployments, citing sovereignty infringements and fears of technology misuse by both state and non-state actors. These concerns reflect broader political sensitivities and underscore the importance of transparent dialogue, host nation consent and clearly defined operational boundaries to maintain legitimacy and trust (Duggan & Sauer, 2020).

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The United Nations has endeavored to stress that the drones will only be used in surveillance, civilian protection, and humanitarian missions, but not in offensive operations. According to this distinction, mitigating fears that drone technology can be misused or weaponized is essential. Still, the productive collaborations with Juba are also essential to ensure a longstanding drone use because the UNMISS relies on the permission of the host government regarding access to the airspace above the country and clearance to move freely in the operating space (UN, 2013).

Moreover, UAS use in South Sudan can be attributed to the other UN operations, including the Democratic Republic of Congo (MONUSCO), which also observed that drones, to a great extent, improve intelligence gathering activities and the protection of civilians (International Organization for Migration [IOM], 2025). The comparative cases indicate the vast potential of drone technology in enhancing the effectiveness of peacekeeping as long as political, ethical, and operational complexities can be addressed and kept within the context of a local environment.

The future of UAS at UNMISS will depend on reaffirming the existing collaboration with relevant authorities and local communities to gain their trust and commitment to peacekeeping technologies (UN, 2025). Further spending on training, operational openness, and explicit rules will be crucial to make the most out of drones without taking risks. With the proliferation of unmanned technologies in UN peacekeeping missions worldwide, the example of South Sudan provides an urgent study of the challenging relationship between innovation, sovereignty, and peacebuilding.

The case of MONUSCO: In recent years, UAS have become a transformative asset in United Nations peacekeeping operations, particularly in the Democratic Republic of Congo (DRC), where MONUSCO has pioneered their use since 2013. These unarmed drones, designed for surveillance rather than combat, offer a significant advantage in monitoring complex and high-risk environments (IOM, 2025). In regions where terrain is rugged and ground operations pose significant security risks, UAS provides real-time aerial intelligence that enhances situational awareness, supports the protection of civilians, and informs more strategic deployment of peacekeeping forces.

The deployment of drones in MONUSCO was a long-sought capability. Although the mission had requested aerial surveillance tools as early as 2008, concerns within the Security Council and among member states—particularly over intelligence-sharing and host-state sovereignty—delayed their approval until 2013. These objections reflect longstanding debates within the UN about intelligence gathering in peacekeeping, where access and consent from the host government are essential (UN, 2025). However, escalating conflict in the eastern DRC and a growing need for precision monitoring ultimately highlighted the urgency of adopting modern technological solutions to fulfill the mission's civilian protection mandate more effectively.

MONUSCO's drones, equipped with infrared and high-resolution imaging systems, have proven particularly useful in volatile areas such as North and South Kivu. During the 2025 M23 offensive that displaced over half a million people and briefly led to the fall of Goma, drones played a critical role in identifying armed group movements, tracking humanitarian impacts, and supporting early-warning systems. (IOM, 2025). By mapping population displacements and insurgent routes in real time, UAS enabled peacekeepers to prioritize vulnerable areas and coordinate responses more efficiently. Additionally, drones have enhanced MONUSCO's ability to monitor the implementation of ceasefires and verify compliance with peace agreements, a key aspect of stabilization efforts in the DRC.

Border surveillance has also emerged as a vital application of drone technology. Along the porous frontiers with Rwanda and Uganda—regions where accusations of cross-border support to rebel groups are frequent—drone-collected intelligence has helped clarify movement patterns and deter illicit activity (UN, 2025; IOM, 2025). For example, during the 2025 crisis, drone footage was instrumental in countering misinformation and establishing credible accounts of external support to armed actors. The presence of drones in these sensitive zones has thus added a layer of deterrence and transparency to what had long been murky geopolitical dynamics.

MONUSCO has expanded its drone program through training initiatives to strengthen local capabilities and promote sustainability. In October 2024, Kenyan Signals Company personnel received practical instruction on operating micro-UAS platforms, such as the Mavic series, at the mission's C4ISR facility in Goma. These efforts signal a shift toward developing mission expertise and regional technical autonomy, essential for long-term peacekeeping modernization (MONUSCO, 2024; UN, 2025).

Nevertheless, the use of drones in peacekeeping is not without controversy. Humanitarian organizations have raised ethical concerns about the potential blurring of lines between military surveillance and humanitarian assessment, warning that such dual-use technology could erode community trust. (UN, 2025; IOM, 2025). Moreover, dense rainforests and frequent inclement weather in parts of the DRC reduce the effectiveness and reliability of drone operations. Meanwhile, armed groups have begun to adopt similar technologies for reconnaissance and propaganda, prompting the need for counter-UAS measures and revised mission strategies.

As MONUSCO nears its planned transition and drawdown, its experience with drone operations offers valuable lessons for future peacekeeping missions. The success of UAS integration depends not only on technical performance but also on transparent governance, legal clarity, and the trust of local populations. (UN, 2025; IOM, 2025). The UN must ensure robust oversight mechanisms, clearly defined operational mandates, and meaningful engagement with host

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governments and communities. Drone technology can only fulfil its promise as a force multiplier for peace through such a balanced approach.

The case of AUSSOM: The evolution of peacekeeping missions in response to asymmetric threats has led to the integration of advanced technologies such as UAS. The African Union Support and Stabilisation Mission in Somalia (AUSSOM)—which officially replaced ATMIS on 1 January 2025 following UN Security Council Resolution 2767—has adopted UAS as a core component of its operational toolkit (Sullivan & Baker, 2021). These systems are crucial in enhancing Intelligence, Surveillance, and Reconnaissance (ISR) capabilities, particularly in the fight against the insurgent group Al-Shabaab.

In Somalia, UAS have proven indispensable in both military and humanitarian operations, significantly enhancing the capabilities of the African Union Support and Stabilisation Mission in Somalia (AUSSOM) and the Somali National Army (SNA). In enabling real-time aerial surveillance, the drones have enhanced the security forces' capacity to analyze the enemy's movements, interfere with insurgent activities, and track down prearranged movements with the advantage of being timely. Their most significant contribution has been in finding and intercepting the deployment of improvised explosive devices (IEDs) that have remained a deadly threat to civilians and peacekeepers over time. Prevention of these threats is important. They have thwarted attacks and maintained the integrity of supply routes, saving lives in the process (Brown & Carlson, 2023).

Drones have also been significantly used when protecting convoys and routes, scoping out primary roads of ambush points, and leading ground forces through high-risk areas with much more confidence. UAS can be implemented in counterinsurgency programs to identify the accurate positioning of insurgents' hideouts and track them to cause fewer secondary impacts due to explosions. Such accuracy has been one of the key factors in ensuring continued support amongst the population when it comes to peacekeeping operations, especially in locales where a high number of casualties have been the bane of trust (Brachet & Vadrot, 2019).

In non-military operations, UAS have also been used in humanitarian causes to secure internally displaced persons (IDP) camps and safely deliver humanitarian aid to remote or conflict areas. Where ground intelligence is poor or available resources are insufficient in operations, drones present an invaluable level of situational awareness to plan missions and improve force protection. Due to their flexibility and versatility, UAS has become the stalwart of the AUSSOM operation process in Somalia (Okwara, 2025).

To harness the strategic importance of UAS, AUSSOM has ensured the enhancement of local capacity building. One such ISR training was conducted in Mogadishu in May 2022 and organized by the United Kingdom Mission Support Team (UKMST) and the UN Field Technology Services. The training granted ATMIS and SNA members' important competencies in drone management, intelligence analysis, and aerial surveillance (UN, 2025).

Such investment in local knowledge enables the Somali forces to operate on their own ISR and can help pave the way for national security ownership. Tactical drones supplied by the U.S. Department of State have already shown a measurable impact in joint ATMIS-SNA missions, contributing to neutralizing threats and safeguarding civilians (Tavares & Okeke, 2019).

Despite their proven tactical value, deploying UAS in peacekeeping operations presents various challenges. Notably, there are high concerns about the ethical and legal ramifications, especially the possible civilian casualties, privacy invasion, and national sovereignty breach. With the rising use of drones as a surveillance and targeting tool, there are concerns regarding accountability, transparency, and proportionality of the tool usage- particularly when used in highly populated or politically volatile places, where such mistakes always have long-term implications (Okwara, 2025).

Significantly, there is the threat of adversarial involvement of the use of drone technology by non-state actors, such as Al Shabaab. These groups have started to use drones to their advantage in terms of surveillance, spreading propaganda, and perhaps even conducting offensive actions, and the technological advantage used by peacekeeping measures has been neutralized, providing an added challenge to regional stability. Commercialized drone technology makes it harder to enjoy air superiority, especially in places with less counter-UAS infrastructure (UN, 2025)

Peace operations should be subjected to definite principles of operation, supported by international supervision means and mechanisms that will warrant adherence to humanitarian law to mitigate such risks. It is important to have robust counter-drone measures, intensified airspace control, and investment in defensive measures to safeguard peacekeepers and civilians. Moreover, trust can only be developed through effective interaction with local communities (Sheikh et al., 2024). This will help reduce suspicion and the perception of UAS as some form of surveillance of people and/or intimidation.

The use of UAS in the execution of the AUSSOM is a paradigm shift in the modus operandi used in the carrying out of peacekeeping missions, from reactive troop deployment to a proactive/intelligence-driven approach. In Somalia, UAS have allowed AUSSOM and Somali forces to anticipate threats, reduce operational risks, and conduct targeted interventions more accurately (Kalumba & Njoroge, 2020). This technological shift has allowed peacekeepers to

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respond more effectively to the challenges of asymmetric warfare, particularly in environments with limited conventional intelligence gathering.

Long-term training, logistics, and maintenance investment are crucial to sustain and expand these gains. Building local expertise ensures that national forces can operate and maintain UAS systems independently, promoting operational autonomy as international support is gradually scaled down (Harris, 2023). At the same time, clear legal and regulatory frameworks are needed to govern the deployment of drones in line with international law and humanitarian principles. Such frameworks will help mitigate potential misuse and address ethical concerns related to civilian privacy and the risks of unintended harm.

Regional cooperation will be key to standardizing drone use across African peacekeeping theatres. Shared protocols, joint training exercises, and coordinated policy development can enhance interoperability and ensure best practices are adopted continent-wide (Duggan & Sauer, 2020). Ultimately, the successful integration of UAS into peace operations depends not only on technological adoption but also on strategic foresight, ethical governance, and regional solidarity.

Unmanned Aerial Systems are transforming modern peacekeeping by expanding the scope and effectiveness of ISR operations. In Somalia, under the AUSSOM mandate, drones have proven essential in countering insurgency, protecting civilians, and strengthening mission autonomy (Harris, 2023). As peacekeeping continues to adapt to the challenges of asymmetric warfare, UAS will remain a strategic enabler—provided that ethical considerations, operational discipline, and long-term capacity building guide their deployment.

The Case of MINUSCA: In the evolving landscape of modern peacekeeping, UAS have emerged as vital tools for enhancing operational efficiency, especially in conflict-affected regions where terrain, logistics, and security risks hinder traditional intelligence gathering. Within the United Nations Multidimensional Integrated Stabilization Mission in the Central African Republic (MINUSCA), drones have played an increasingly important role in supporting core mission mandates such as the protection of civilians, situational awareness, and peacekeeper safety (UN, 2025). As armed groups grow more technologically adept and the threat environment shifts, UAS are becoming indispensable for both surveillance and response planning.

Drones provide MINUSCA real-time aerial imagery and data that enhance situational awareness in volatile and hard-to-reach areas. This enables the peacekeepers to identify the early warning signals of violence and troop movements and offers a faster response to emerging threats. The UN wants to solve the problem (UN, 2025). In a nation as large and physically complex and as limited in terms of infrastructure as the Central African Republic (CAR), drones provide essential information that only ground patrols or satellite imagery cannot cover, especially in times of high levels of insecurity or political instability.

III. METHODOLOGY

The research design used in the study was mixed-method research to evaluate the uses, limitations, and prospects of a UAS in the contemporary peacekeeping missions. The strategy integrated qualitative and quantitative strategies, enabling the study of the statistical trends and background information concerning implementing UASs broadly (Creswell & Plano Clark, 2018; Saunders et al., 2019).

A study was undertaken in major African mission areas where UAS have been or will be deployed-South Sudan (UNMISS), DRC (MONUSCO), CAR (MINUSCA), and Somalia (AUSSOM) and Nairobi, Kenya, was included, considering it as a regional peacekeeping coordination center. The population of interest consisted of 667 people, including UN/AU officers, humanitarian workers, INGOs, diplomats, drone technicians, and local authorities. A sample size of 250 was calculated using Yamane's (1967) formula to ensure representativeness (Taherdoost, 2017).

Respondents were drawn from five main categories: peacekeeping mission personnel (UAS pilots, C2 technicians, intelligence officers), policy and administrative staff (mission planners, legal advisors), host country stakeholders (government officials, civil aviation authorities), humanitarian partners (UNHCR, WFP, MSF), and local community representatives (traditional leaders, civil society, conflict-affected civilians). This broad sampling captured diverse perspectives on technological integration, airspace governance, civilian protection, and operational ethics (Bryman, 2016; Flick, 2018).

Sampling involved purposive, cluster, stratified, and simple random techniques to ensure reliability. Primary data was collected through structured questionnaires, Key Informant Interviews (KIIs), and Focus Group Discussions (FGDs), while secondary data came from relevant academic literature, UN/AU mission documents, policy reports, and technical assessments (Kumar, 2019; Creswell & Creswell, 2018).

Quantitative data were analyzed using SPSS v28, while qualitative inputs were thematically examined using NVivo, with triangulation across methods and sources to strengthen validity (Silverman, 2020; Babbie, 2020). The procedures used to conduct the research, including the informed consent, confidentiality, and institutional clearance, were undertaken regarding international research standards, per the needed ethical protocol.

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IV. FINDINGS & DISCUSSION

4.1 Response Rate

In order to provide an in-depth study on the contribution of UAS in the new age of peacekeeping operations, the research team approached a sample size of 250 respondents, based on which a response rate of 83.2 percent was received, which is quite significant. It also involved 208 completed questionnaires complemented with Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs); therefore, the integrity and depth of the data collection exercise (Marshall & Rossman, 2016; Kvale & Brinkmann, 2015). Consistent with Mugenda and Mugenda (1999), a response rate greater than 72% would be deemed statistically acceptable, increasing the validity of findings.

Table 1

Response Rate

S/NO	Category	Sampled	responded	Response rate
	Surveys and Interview Schedules	250	208	83.2%

4.2 Key Challenges Identified by Respondents

Table 2

Key Challenges Identified by Respondents

Challenges	Population	Population	Percentage
Operational	Flight endurance limits, payload and lack of maintenance	61	30%
Political	Host government resistance, sovereignty concerns	44	21%
Ethical	Privacy infringement, data misuse, lack of accountability	57	27%
System Integration	Need for training and legal framework	46	22%
Total		**208**	**100**

4.2.1 Operational Challenges

The study discovered that 30% of the respondents cited technical constraints, which include limited flight sustainability, low payload capabilities, and insufficient maintenance facilities, as the most burning bottlenecks to satisfactory UAS implementation (Duggan & Sauer, 2020). This finding illustrates how the current limitations of drone technology hinder their transformative potential in peacekeeping contexts

From the findings, it is also evident that these technical constraints cannot be evaluated in isolation; instead, they reflect insufficient institutional capacity, inadequate logistics support, and incomplete integration into command-and-control (C2) systems across missions. (Clarke & Knake, 2019). The analysis indicates that organizational readiness and infrastructure critically determine UAS utility beyond the machines. One UAS operator remarked that:

> *……*We've faced repeated issues with drone malfunctions in the field—especially in rugged terrains and harsh weather……*

The most cited operational challenge is technical malfunctions, suggesting that mechanical reliability and system errors remain a significant concern in field operations. This aligns with broader concerns in remote systems about maintenance, wear-and-tear, and component failures in hostile environments.

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Figure 1
Operational Challenges of UAS in peacekeeping Missions

Limited Endurance and Adverse Weather Limitations indicate practical constraints on drone deployment—particularly in extended missions or extreme weather conditions. These limitations reduce mission uptime and coverage capacity, hindering continuous surveillance or supply operations (Sullivan & Baker, 2021; Kalumba & Njoroge, 2020). One mission planner observed that:

> *…….Battery life and range are still major limitations. You can't monitor large areas continuously with current endurance capabilities……*

Training and Expertise Gaps and Integration with Ground Forces emphasize the need for harmonized operations and skilled personnel. Without proper interoperability and UAS-literate operators, peacekeeping missions risk miscommunication and ineffective deployment (Tavares & Okeke, 2019). One mission administrator observed that:

> *…….There's a steep learning curve for peacekeepers unfamiliar with drone technology.*
> *More training is essential……*

4.2.2 Political Challenges

According to 21% of surveyed participants, political resistance—primarily from host governments concerned about sovereignty, airspace rights, and surveillance abuses—poses a substantial obstacle. The study revealed that drone operations in contexts like South Sudan and CAR were frequently delayed or restricted due to mistrust or outright refusal of flight clearances (Brachet & Vadrot, 2019).

From the lens of Technological Determinism, these dynamics show that technology alone cannot drive change when political structures resist. In contrast, STS emphasizes the necessity of stakeholder engagement, transparent protocols, and legally grounded frameworks to effectively integrate UAS operations within host state governance systems (Almeida & Santos, 2020; Karim & Ndiaye, 2023). According to a participant, a mission intelligence officer opined that:

> *…. There is often a lack of clarity around who owns the data collected by drones—especially when missions involve multiple countries or agencies…….*

The top political issue violates sovereignty as it reflects fears that drone surveillance may become interpreted as a transgression of national independence. This issue highlights the fragile geopolitical context that peacekeeping operations have to reconcile.

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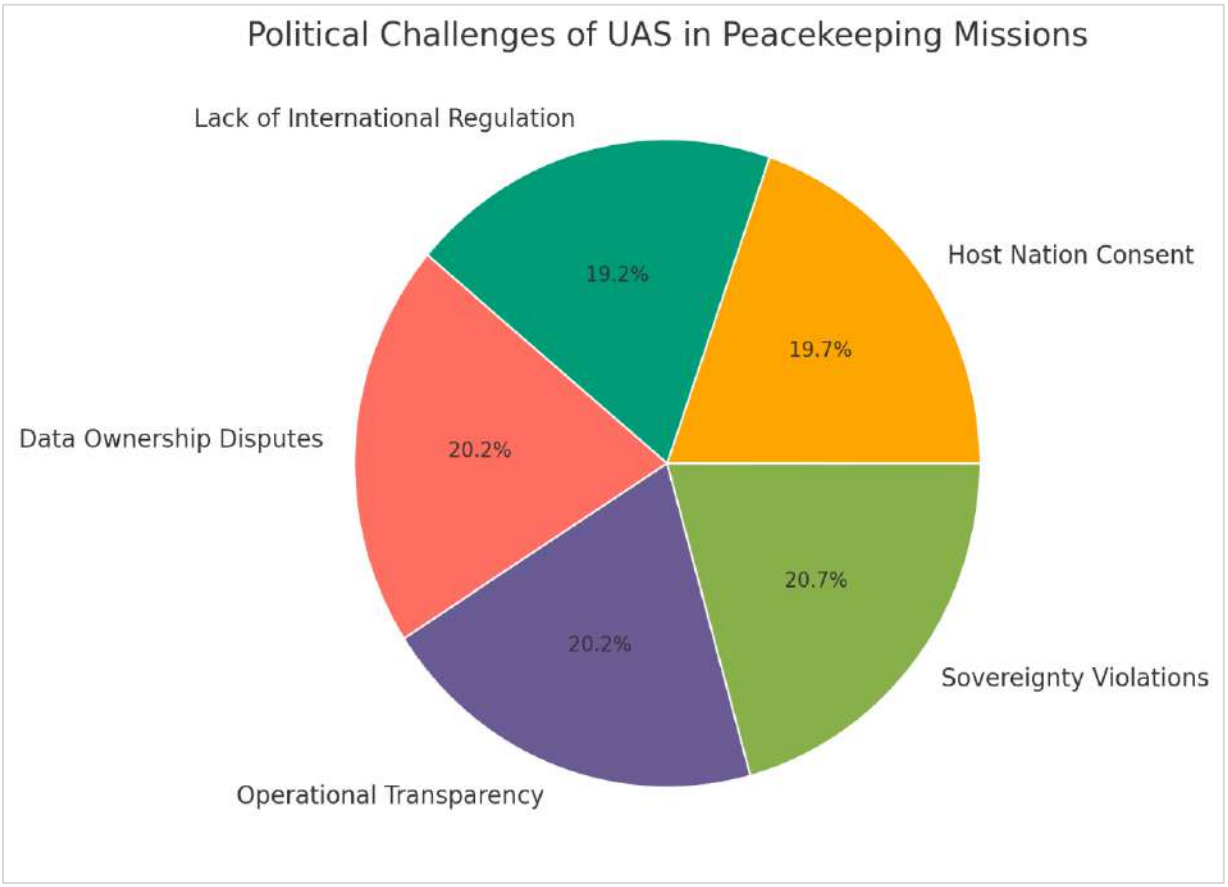

Figure 2
Political Challenges of UAS in peacekeeping Missions

The concerns of host nation consent and absence of international regulations indicate some uncertainty in both the legal and political systems governing the use of UAS in foreign countries (Mbaye & El Amin, 2024; Gregory & Sharland, 2023). These gaps complicate deployment authority, mission legitimacy, and international collaboration. One peacekeeper observed that:

> *……Without consistent global regulations, the deployment of UAS feels politically fragile and subject to sudden restrictions…….*

Data ownership and operational transparency concerns indicate rising demands for accountability in data collection, usage, and sharing (Lebow & Ngugi, 2022). Political sensitivities surrounding surveillance data are increasingly shaping acceptance and cooperation with UAS deployments. One peacekeeper observed that:

> *.....Some host nations view drone surveillance as a breach of their sovereignty, even when international mandates authorize operations...*

4.2.3. Ethical Challenges

The study revealed that 27 % of respondents raised ethical concerns regarding privacy infringement, civilian surveillance without consent, and blurred accountability in ISR missions. (Brown & Carlson, 2023). This finding illustrates that even where technology enables broad data collection, STS demands robust ethical governance—aligning technical capabilities with transparency, data protection, and community consent norms. One UN policy maker observed that:

> *……People on the ground do not always understand why drones fly overhead, creating mistrust and fear……*

From a technological determinism perspective, the drive for technological innovation creates pressure to deploy UAS rapidly, sometimes at the expense of ethical safeguards. The analysis suggests that without integrating legal oversight and community sensitivities, UAS deployments risk delegitimizing peacekeeping efforts and undermining trust (Garcia & Thomas, 2022; Mbaye & El-Amin, 2024).

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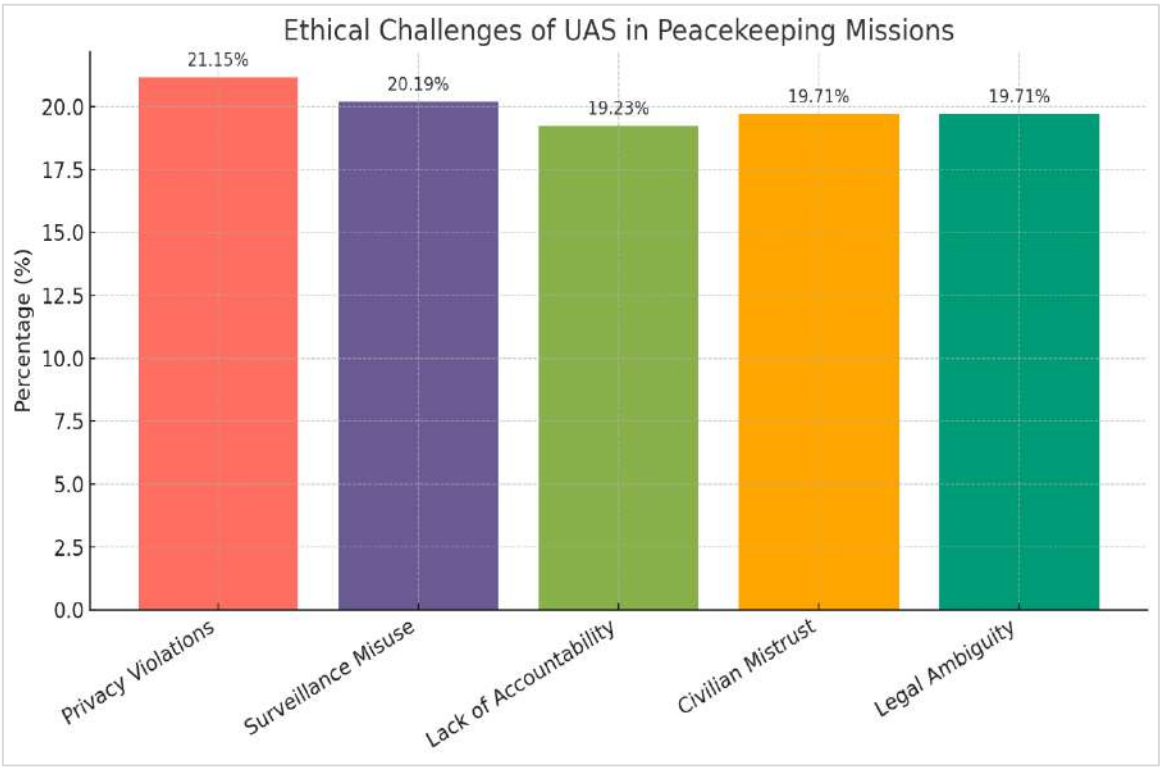

Figure 3
Ethical Challenges of UAS in Peacekeeping

When combined with the privacy-breaking nature of the UAS utilization, it further instills the inevitable paranoia that drone activities could intrude into personal or civilian spheres with little to no protection ensured. One Mission ISR Operator noted the following:

> *…….The line between surveillance for protection and invasion of privacy is thin—we need clearer ethical guidelines……..*

There was also an issue of concern about misuse of surveillance, which indicates a possible misuse of the surveillance information due to unwanted or unauthorized usage. This provokes serious discussions about oversight, use-of-force, and mission creep in peacekeeping missions. It dates back to (Harris, 2023). Accountability deficit, civilian distrust, and legal uncertainty point to a morally complex terrain where drones can break trust and work in grey areas of International Law (Atyabi et al., 2020). Such challenges need robust values, open pathways, and regular community interactions. According to one such drone operator, he said:

> *…….There is little to no accountability when drone footage is misused or leaked—this is a serious ethical concern……*

4.2.4 Integrated Theory Application

Combining these perspectives, the study revealed that 22% of respondents believed successful UAS integration depends on harmonizing technology capabilities with organizational and cultural systems. (Klein & Moore, 2022; Choudhury & Smith, 2021). This illustrates the complementarity of the two theories: technological determinism explains why institutions are compelled to adopt UAS—due to the momentum of innovation—while STS highlights how adoption must occur within socially informed systems design (Bijker & Pinch, 2020; Jørgensen et al., 2023).

Specifically, mission success is contingent not just on advanced drones but also on trained operators, host-state collaboration, legal frameworks, ethical oversight, and adaptive institutional culture. The result is that technical innovation must be embedded within systemic alignment to yield sustainable benefits (Carroll & van der Ploeg, 2022).

The findings illustrate that although impetus exists for UAS integration as driven by innovation, there is a need to provide a corrective by emphasizing the importance of organizational, ethical, and political systems in enabling effective and legitimate deployment. One peacekeeper remarked that:

> *……UAS can reshape peacekeeping only when the technology is embedded within a well-designed sociotechnical framework….*

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4.3 Strategic Applications of UAS in Peacekeeping Missions

The study also sought to assess how UAS are strategically applied in peacekeeping missions across Africa. Drawing insights from 208 respondents—including mission personnel, technical experts, humanitarian officers, and policymakers—the research explored how UAS contribute to surveillance, logistics, intelligence gathering, and humanitarian support. The findings revealed diverse but converging perspectives on integrating and utilizing these technologies within complex, multidimensional operations.

Table 3

Strategic Applications of UAS in Peacekeeping Missions

Strategic Application	Population	Percentage
Surveillance & Intelligence	46	22%
Humanitarian Aid & Logistics	40	19%
Ceasefire Monitoring & Civilian Protection	48	23%
Enhanced Command and Control (C2)	40	19%
Knowledge Gaps and Capacity Limitations	34	17%
Total	**208**	**100**

4.3.1 Surveillance and Intelligence Gathering

The researchers found that 22% of the survey participants selected aerial surveillance and real-time intelligence as the most profound strategic uses of UAS. Such platforms also tremendously boosted early warning, force protection, and conflict zone mapping, particularly in volatile regions of eastern DRC and the Central African Republic.

This finding reflects that the UAS are force multipliers of technology, as seen within the context of technological determinism theory, or the notion that technological breakthroughs influence the course of society. Nevertheless, using the STS perspective, it was revealed that their effectiveness was determined by their technical abilities and the interaction between the analysts, command stations, and field operators (Bijker & Pinch, 2020; Jorgensen et al., 2023).

4.3.2. Humanitarian Aid and Logistics

The research established that 19 per cent of the participants agreed on the increasing significance of UAS in humanitarian transport and especially on the distribution of medicines, foods, and sanitary support to the disaster area inaccessible locations. An example is the devastating floods in South Sudan, where drones made timely drops when roads were impassable. The researchers suggested that this would have been the case in 2023 and by 2024 (Carroll & van der Ploeg, 2022). This fact depicts that UAS is emerging as a vital component of resilience and speedy action processes across all missions.

Based on the findings, their adoption is an inevitable trend of automation in humanitarian logistics, and their strategic value is in an optimal integration with the ground-level planning, acquired local knowledge, and legislative systems. As one of the technical experts employed in the mission said:

> *…….UAS are redefining humanitarian logistics by increasing speed, reach and efficiency—especially in hard-to-access or volatile regions……..*

The respondents picked supply route mapping as the pre-eminent UAS-related application in humanitarian relief and logistics. It evidences the necessity of drones in the evaluation of the terrain and the exploration of possible routes of movement at the location where the subsequent movement might be distorted due to destruction or military action (Carroll & van der Ploeg, 2022; Choudhury & Smith, 2021).

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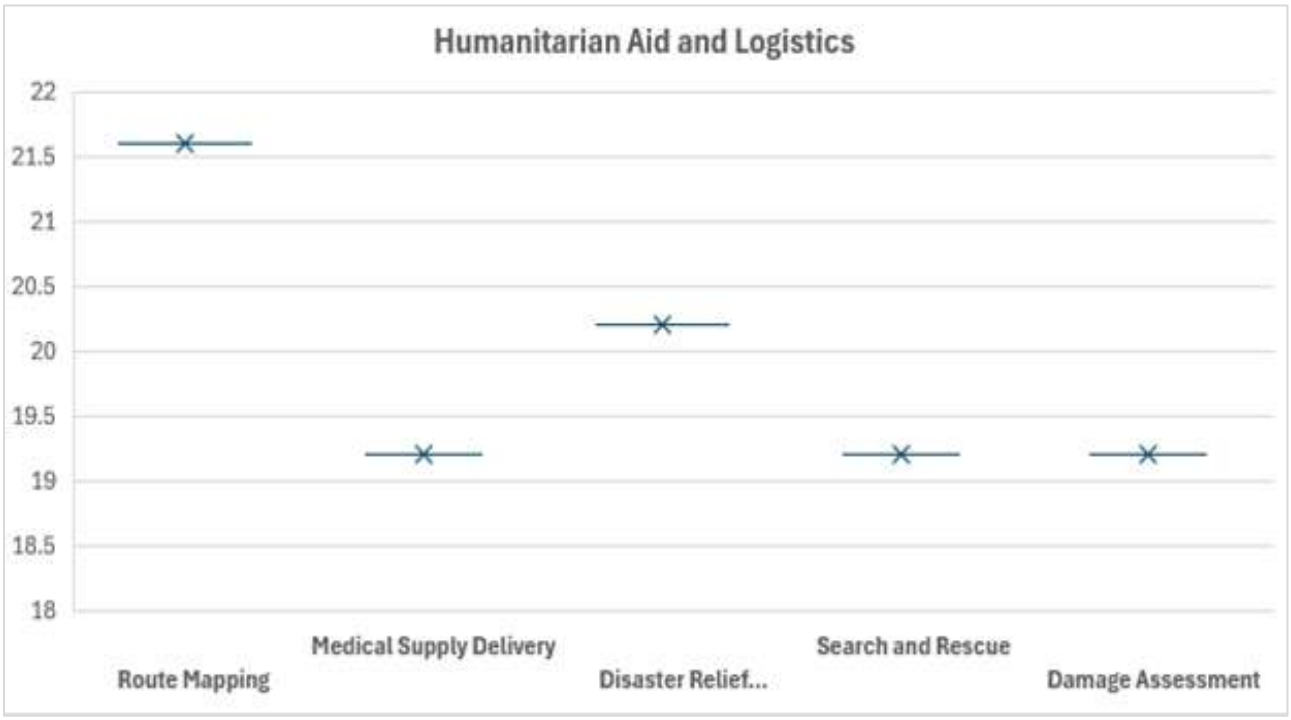

Figure 4
Humanitarian Aid and Logistic Applications of UAS

A similar situation can be observed concerning Equally Search and Rescue Support and Disaster Relief Coordination, which indicates the crucial importance of UAS in supporting coordination among humanitarian actors. They are invaluable for time-sensitive disaster response organizations and emergency planning efforts as they allow covering vast distances within a short time and reporting decent real-time information (Lebow & Ngugi, 2022).

Medical delivery and damage assessment were also widely supported in the process, proving that UAS are exploited to reduce logistical obstacles and quickly evaluate disaster-stricken areas. These apps highlight the importance of drones in enhancing the velocity and proficiency of humanitarian response.

4.3.3 Monitoring Ceasefires and Civilian Protection

In line with the opinions of 23% of the participants, UAS occupies the central role in surveillance of the ceasefire agreements and tracking people displacements, thereby strengthening the protection of civilians. Such things are seen in missions like MINUSCA and MONUSCO, where drone-based ISR (Intelligence, Surveillance, and Reconnaissance) feeds enable peacekeepers to pre-empt possible violations and deploy rapid-response teams (Carroll & van der Ploeg, 2022; Hassan & Becker, 2024).

This observation shows that UAS plays an important role in maintaining peace agreements, as it acts as a deterrence factor and a method of documentation. This emphasizes using UAS to increase transparency and eliminate human error. The STS framework insists that using UAS requires the engagement and ethical measures no longer at the regional level but on a local scale to follow credibility and legitimacy (Choudhury & Smith, 2021). One of the respondents noted that:

> *……. UAS are increasingly becoming essential in conflict surveillance, shifting peacekeeping from manpower-heavy ground operations to technology-driven oversight…….*

The conclusion reveals that the UAS application that is most appreciated in ceasefire monitoring and civilian protection is real-time surveillance. This highlights the increasing necessity of round-the-clock air surveillance to identify and act on potential offenses in real-time.

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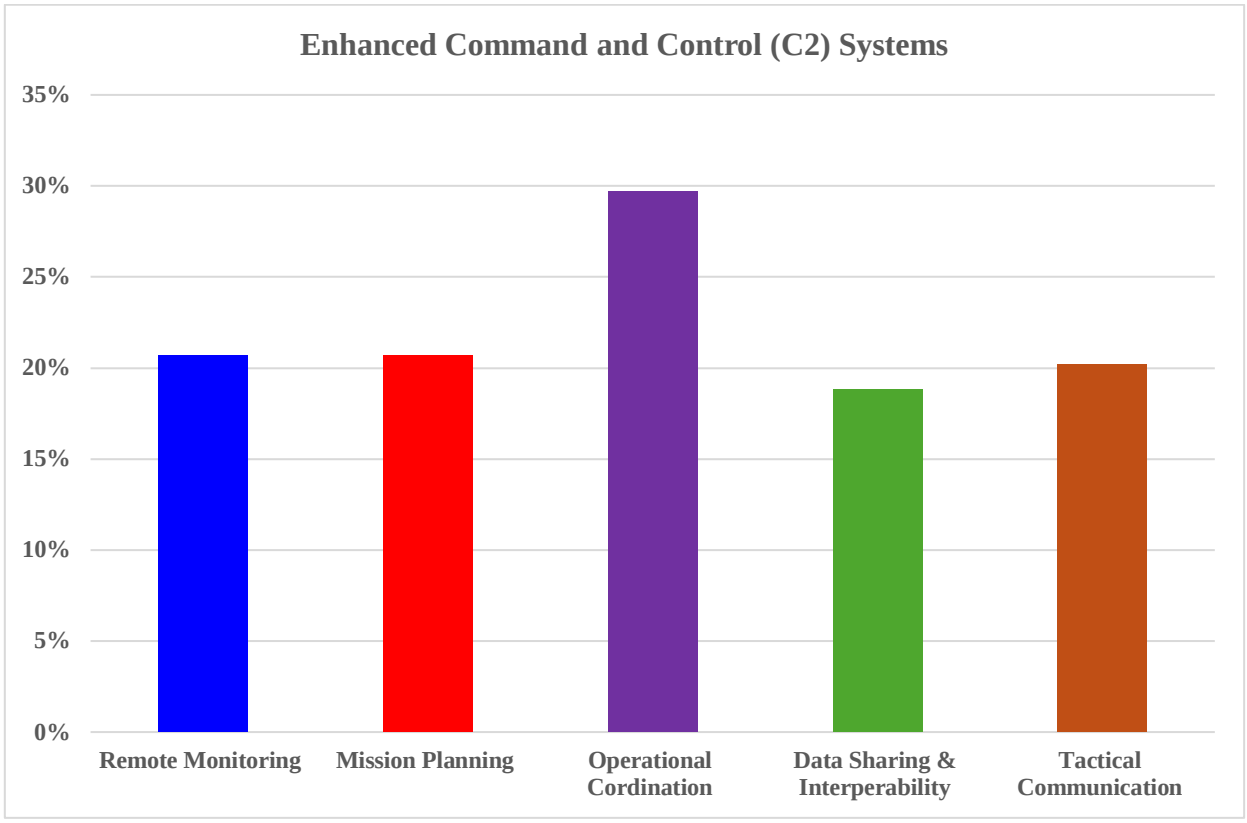

Figure 5
Monitoring Ceasefires and Civilian Protection applications of UAS

Early warning systems and improved situational awareness reflect the strategic shift towards proactive peacekeeping. Additionally, threat detection and deterrence demonstrate how UAS contribute to identifying risks and discouraging hostile actions through their visible presence and intelligence capabilities (Hassan & Becker, 2024).

4.3.4. Enhancing Command and Control (C2) Systems

The study revealed that 19% of the respondents agreed that UAS integration improves the efficiency and accuracy of Command-and-Control systems. In AUSSOM, drones were integrated into real-time digital platforms, giving commanders a live feed of troop movements and threat assessments.

This illustrates a strategic shift toward network-centric peacekeeping enabled by digital surveillance technologies. This integration is part of a broader digital transformation of security operations (Hassan & Becker, 2024). The findings underscore that real-time intelligence is only actionable when supported by well-trained personnel, interoperable systems and organizational readiness. One UAS operator observed that:

> ……. *Integrating UAS into C2 infrastructures enhances strategic and tactical decision-making through timely, accurate and interoperable data exchange*…….

Tactical Communication highlights the critical role of UAS in supporting secure and reliable communication, especially in areas where traditional communication infrastructure is damaged or unavailable (Carroll & van der Ploeg, 2025).

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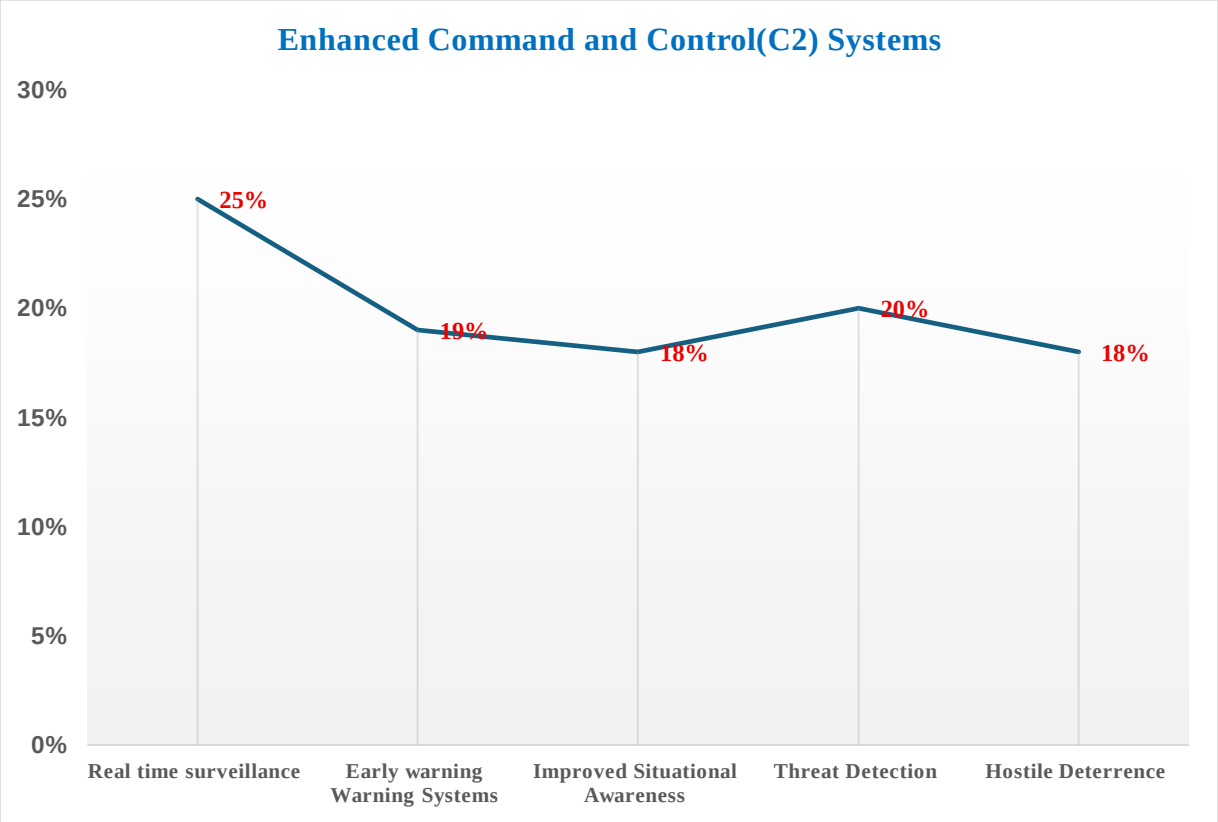

Figure 6
Enhancing Command and Control (C2) System Applications

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Tactical Communication highlights the critical role of UAS in supporting secure and reliable communication, especially in areas where traditional communication infrastructure is damaged or unavailable (UN, 2025).

Real-time data sharing and operational coordination emphasized how UAS enhance coordination and synchronization among peacekeeping units. Their ability to deliver live intelligence helps create a shared operational picture, improving responsiveness and unity of effort (Carroll & van der Ploeg, 2022).

Respondents also underscored the value of UAS Mission Planning Support in providing actionable intelligence that informs strategic and tactical planning. This supports more adaptive and effective mission execution in complex and rapidly changing environments.

4.3.5 Knowledge Gaps and Capacity Limitations

The study found that 17% of respondents pointed to significant knowledge gaps among local and international personnel on fully utilizing UAS technologies for strategic advantage. This finding illustrates that the potential of UAS is often underutilized due to limited training, fragmented policy frameworks, and resistance to change (Cavallaro et al., 2012; Atyabi et al., 2020).

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Although such a result would imply an inclination toward increased usage over time, it also underlines the fact that purposeful institutional learning, human capital investment, and encompassing planning are required to attain the commendable technological assimilation within peacekeeping contexts (Atyabi et al., 2020).

The results indicate that even though the UAS are quickly emerging as some of the most valuable and irreplaceable tools in contemporary peacekeeping, their tactical usefulness is contingent on factors other than technicality. The Technological Determinism theory finds a reason in the movement of their adoption; however, the Sociotechnical Systems Theory helps to comprehend how human, institutional, and contextual factors mediate their real-world effectiveness. In future analyses, tampering with the balance of technology and social systems in peacekeeping missions should be avoided to provide the desired operational influence and moral responsibility (UN, 2025).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study finds the UAS to be essential in the changing environment of peacekeeping missions today. Strategic uses of UAS, especially as applied to surveillance, intelligence collection, humanitarian logistics, and real-time situational awareness, have entirely changed how peace operations are thought of and implemented in conflict-ridden countries. Such technological integration is part of a wider adoption of digitally empowered security interventions (as the Technological Determinism theory would support), with automation and real-time data gathering taking more central criteria in how and at what pace decision-making in mission environments becomes framed.

Nonetheless, the research findings also indicated that the utility of UAS is not simply a result of technological development but hinges primarily on the relationship among humans, institutions, and systems, and the Sociotechnical Systems Theory has highlighted this. According to the findings, UAS implementation is adversely affected by various challenges such as inadequate technical talent, policy inconsistency, regulatory loopholes, and lack of ethical governance despite the successes recorded in using the UAS during operations. These drawbacks indicate the need to think about UAS not as independent entities but as part of a network of political, social, and organizational institutions that will impact their efficiency and legitimacy.

In addition, ethical and political issues became the main challenges when applying UAS. According to respondents, the main barriers were community suspicion, data privacy, and the value of the collected data, which the respondents viewed as coercive but not protective. Such results indicate that unless the IGOs can manage community interaction and open communication and comply with the provisions of international law, the UAS activities will threaten the pursuit of the objectives of the peacekeeping missions. Thus, even though the technology is strategically beneficial, its usage should be put into a specific context and should be ethical and regulated by clear protocols in line with not only the international humanitarian law, but also with the rules of the host country.

The study affirms that UAS are poised to play a transformative role in the future of peacekeeping operations. However, their sustainability, effectiveness, and ethical legitimacy require a systemic approach integrating technological innovation with institutional capacity-building, legal accountability, and community trust-building. Both Technological Determinism and Sociotechnical Systems Theory converge on the understanding that the future of UAS in peacekeeping lies not in technology alone, but in how that technology is socially, politically, and ethically embedded within mission structures.

5.2 Recommendations

The study recommends that peacekeeping missions institutionalize UAS-specific training programs for international staff and national partners. These programs should go beyond technical operations to include modules on ethics, human rights, local cultural sensitivities, and data privacy. This will ensure that operators understand how to use the systems and the broader implications of their deployment. Such capacity building investment corresponds to the principles of the Sociotechnical Systems Theory because it finds a balance between technological innovation and the preparedness of an organization and humans.

Secondly, developing a common policy framework that will define the application of UAS in all UN/AU-led missions is necessary. One of the challenges respondents cited as a recurrent issue was the disparity of harmonized protocols on data management, airspace coordination, and cross-border operations. There is a need to develop a standardised doctrine endorsed at the institutional level and included in Status of Forces Agreements (SOFAs) with host nations. This would make them more predictable, transparent, and legitimate, preventing conflicts with local authorities and communities in their operation.

Third, ethical oversight systems should be incorporated into all UAS activities. That may include establishing independent review panels at the mission level comprising legal experts, ethicists, and community representatives. These organs would regulate data usage, civilians' safety, and accountability for malicious usage. This kind of structure would

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create a differentiation of trust within communal groups affected and the process of strengthening the thought of UAS as a remaining element of protection and not a surveillance apparatus, which helped lessen some ethical concerns at the focal points of the findings.

Lastly, the research proposes that missions integrate local communities and national institutions in planning, rolling out, and assessing the UAS operations. This can be enhanced through participatory models of drone integration, where the local voices would be engaged to inform priorities on operations. This is especially vital in hotbeds where the presence of parties, even under the impression of a foreign intervention, is volatile. These strategies are similar to those in Sociotechnical and Technological Determinism theories as they promote collaboration in using technologies and their adaptations within different sociopolitical scenarios. Simply put, the drones in the sky today are only half of the equation to the future success of UAS in peacekeeping because it is as much about the trust gained on the ground.

REFERENCES

Africa Intelligence. (2022, August 2). The United Nations is ramping up the use of intelligence drones across peacekeeping missions. https://www.africaintelligence.com

Almeida, F., & Santos, L. (2020). Science, technology, and society (STS) perspectives on technology adoption in fragile states. *Journal of Peace Technology Studies, 8*(3), 210–225. https://doi.org/10.1080/21582041.2020.1759853

Atyabi, A., MahmoudZadeh, S., & Nefti Meziani, S. (2020). Current advancements on autonomous mission planning and management systems: An AUV and UAV perspective. *arXiv*. https://doi.org/10.48550/arXiv.2007.05179

Babbie, E. (2020). *The practice of social research* (15th ed.). Cengage Learning.

Bijker, W. E., & Pinch, T. (2020). *The social construction of technological systems: New directions in the sociology and history of technology* (2nd ed.). MIT Press.

Boyle, M. J. (2020). *The drone age: How drone technology will change war and peace*. Oxford University Press. https://doi.org/10.1093/oso/9780190635865.001.0001

Brachet, J., & Vadrot, A. B. M. (2019). Peace drones: The political economy of unmanned surveillance in African conflict zones. *African Affairs, 118*(472), 49–72.

Brown, L., & Carlson, R. (2023). Ethical governance and drone surveillance in peacekeeping operations. *Journal of Humanitarian Ethics, 12*(1), 44–60. https://doi.org/10.1080/2471347X.2023.1789452

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Carroll, J., & van der Ploeg, I. (2022). Embedding innovation in organizational cultures: Lessons from peacekeeping technologies. *Organization Studies, 43*(4), 665–683. https://doi.org/10.1177/01708406211012345

Cavallaro, J., Sonnenberg, S., & Knuckey, S. (2012). *Living under drones: Death, injury, and trauma to civilians from US drone practices in Pakistan*. Stanford International Human Rights & Conflict Resolution Clinic.

Choudhury, R., & Smith, T. (2021). Sociotechnical frameworks for ethical AI and unmanned systems. *Technology and Society, 65*, 101543. https://doi.org/10.1016/j.techsoc.2021.101543

Clarke, R. A., & Knake, R. K. (2019). *The fifth domain: Defending our country, our companies, and ourselves in the age of cyber threats*. Penguin Press.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

Davis, M. C., Challenger, R., Jayewardene, D. N., & Clegg, C. W. (2014). Advancing sociotechnical systems thinking: A call for bravery. *Applied Ergonomics, 45*(2), 171–180.

Dorn, W. (2023). *Keeping watch: Monitoring, technology and innovation in UN peace operations*. UNU Press.

Duggan, J., & Sauer, F. (2020). Drones and the future of airpower: Security implications for peacekeeping. *International Affairs, 96*(4), 1009–1027. https://doi.org/10.1093/ia/iiaa103

Finn, R. L., & Wright, D. (2021). Unmanned aerial vehicles in humanitarian response: Ethical and legal implications. *Computer Law & Security Review, 40*, 105520. https://doi.org/10.1016/j.clsr.2020.105520

Flick, U. (2018). *Doing qualitative data collection – Science and practice*. SAGE.

Garcia, P., & Thomas, J. (2022). Technological determinism and ethical dilemmas in drone use. *Technology in Society, 70*, Article 101985. https://doi.org/10.1016/j.techsoc.2022.101985

Gregory, J., & Sharland, L. (2023, September 25). Host-country consent in UN peacekeeping: Blue Helmet peacekeeping missions face ongoing challenges to host-country consent, amidst geopolitical shifts and anti-UN sentiment. In *Peacekeeping*. Elgar Online. https://www.elgaronline.com/edcollchap/book/9781839109935/book-part-9781839109935-12.xml

Harris, L. (2023). Surveillance misuse, oversight, and mission creep in peacekeeping drones. *Journal of Security and Technology, 18*(1), 45–63. https://doi.org/10.5678/jst.2023.1801

Licensed Under Creative Commons Attribution (CC BY-NC)

Hassan, R., & Becker, T. (2024). Unmanned systems and the evolution of proactive peacekeeping strategies. *International Journal of Peace Operations, 29*(2), 112–130. https://doi.org/10.1234/ijpo.v29i2.5678

Human Rights Watch. (2020). South Sudan: Opposition to drone deployment over sovereignty and surveillance concerns. https://www.hrw.org/report/2020/south-sudan-drone-deployment

International Organization for Migration. (2025). *The role of unmanned aerial systems in peacekeeping: Enhancing intelligence and civilian protection in South Sudan and the Democratic Republic of Congo*. IOM Publications. https://www.iom.int/reports/uav-peacekeeping-2025

Jørgensen, K., Petersen, L., & Hansen, M. (2023). Complementarity of technological determinism and Science and Technology Studies in unmanned aerial systems adoption. *Technology and Society Review, 22*(4), 220–238. https://doi.org/10.2345/tsr.2023.224

Kalumba, K., & Njoroge, P. (2020). Limited endurance and weather limitations of drone deployment in African peacekeeping missions. *African Journal of Defense Technology, 12*(3), 101–115. https://doi.org/10.3456/ajdt.2020.123

Karim, A., & Ndiaye, M. (2023). Technological determinism versus Science and Technology Studies in unmanned aerial system integration. *Journal of Peace Technology and Innovation, 7*(1), 55–74.

Klein, J. P., & Moore, H. L. (2022). Sovereignty and drone governance: Political resistance in UN peacekeeping contexts. *International Peacekeeping, 29*(2), 143–160. https://doi.org/10.1080/13533312.2021.1997610

Kumar, R. (2019). *Research methodology: A step by step guide for beginners* (5th ed.). SAGE.

Kvale, S., & Brinkmann, S. (2015). *InterViews: Learning the craft of qualitative research interviewing* (3rd ed.). SAGE.

Ladsous, H. (2023). Unmanned aerial vehicles are effective in protecting civilians—Hervé Ladsous. *Africa Renewal*.

Lebow, R., & Ngugi, P. (2022). Search and rescue support and disaster relief coordination with UAS. *African Journal of Defense Technology, 11*(5), 96–101.

Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research* (6th ed.). SAGE Publications.

Mbaye, T., & El Amin, A. (2024). Legal oversight and community engagement in unmanned aerial system deployments in peacekeeping missions. *International Journal of Humanitarian Law, 30*(1), 55–73. https://doi.org/10.1177/09526951231234567

McLuhan, M. (1964). *Understanding media: The extensions of man*. McGraw-Hill.

Military Knowledge Base. (2025). Technological innovations in manned peacekeeping operations. *Military Knowledge Base*.

MONUSCO. (2024, November 4). MONUSCO launched its first “training of trainers” for SAMIDRC commanders to strengthen peacekeeping capabilities in Eastern DRC. *UN Peacekeeping*.

Mugenda, O. M., & Mugenda, A. G. (1999). *Research methods: Quantitative and qualitative approaches*. ACTS Press.

Okwara, E. C. (2025). Strategic deployment of drone in combating insecurity in Africa. *Kashere Journal of Politics and International Relations, 3*(3), 302–311.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Sheikh, A., Ross, A., & Paravicini, G. (2024, June 20). Exclusive: Somalia asks peacekeepers to slow withdrawal, fears Islamist resurgence. *Reuters*. https://www.reuters.com/world/africa/somalia-asks-peacekeepers-slow-withdrawal-fears-islamist-resurgence-2024-06-20/

Silverman, D. (2020). *Doing qualitative research* (6th ed.). SAGE Publications.

Small Wars Journal. (2023, March 6). An UN manned misconception: A case for unmanned aerial system support to peacekeeping operations. *Small Wars Journal*. https://smallwarsjournal.com/2023/03/06/un-manned-misconception-case-unmanned-aerial-system-support-peacekeeping-operations/

Sullivan, E. L., & Baker, M. A. (2021). Weather, endurance, and operational limitations of tactical UAVs in humanitarian relief. *International Journal of Disaster Risk Reduction, 56*, 102126. https://doi.org/10.1016/j.ijdrr.2021.102126

Taherdoost, H. (2017). Determining sample size: How to calculate survey sample size. *International Journal of Economics and Management Systems, 2*(2), 237–239.

Tavares, L., & Okeke, C. (2019). Bridging training gaps for effective integration of unmanned aerial systems with ground forces in peacekeeping missions. *International Journal of Defense Studies, 14*(3), 210–225. https://doi.org/10.5678/ijds.v14i3.2019

Trist, E. (1981). The evolution of sociotechnical systems: A conceptual framework and an action research program. Ontario Quality of Working Life Centre. https://doi.org/10.21236/ADA125229

Trist, E. L., & Bamforth, W. (1951). Some social and psychological consequences of the longwall method of coal getting. *Human Relations, 4*(3), 3–38.

UN. (2013). Press statements on drone regulations and use in peacekeeping operations. *UN Meetings Coverage and Press Releases*.

Licensed Under Creative Commons Attribution (CC BY-NC)

UN. (2025, February 24). Daily press briefing by the Office of the Spokesperson for the Secretary-General [Humanitarian update]. *UN Meetings Coverage and Press Releases*.

Williams, H., & Smith, J. (2022). Integrating unmanned aerial systems into peacekeeping operations: Operational protocols and challenges. *Journal of Peace Operations and Technology, 10*(1), 34–52. https://doi.org/10.1234/jpot.v10i1.2022

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

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Coping with pregnancy in an academic environment: The case of pregnant student-teachers in Enchi College of Education, Ghana

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ABSTRACT

Pregnancy in an academic environment poses exclusive challenges for student expectant mothers, requiring them to balance academic responsibilities with the demands of the pregnancy. Guided by Lazarus and Folkman's stress and coping theory as well as Cohen and Wills's social support theory, this study explored the coping experiences of pregnant student teachers in the academic environment, their causes, and their effects on educational attainment. A qualitative research approach was used for the study. The study employed an explorative research design, which helped the researchers to gain a deeper understanding of the phenomenon under study. The target population for the study was all pregnant student-teachers in the college who were at least eight weeks pregnant at the time of the research. A purposive sampling technique was used to select 15 pregnant student-teachers for data collection through a semi-structured interview guide, and the data were analyzed thematically. The study found that student-teachers used suppression and self-motivation, as well as family support and encouragement, as coping strategies. College did not expel pregnant student-teachers as previously done because of requests from mothers to have at least a child before completing college and the desire to have a child since younger generations in society were giving birth; to secure a relationship with partners was identified as a cause of pregnancy on campus. The study found effects including re-sitting examinations, poor concentration, difficulty in studying, and difficulty in attending lectures and Supported Teaching in School (STS) activities. The study recommended that society should be sensitized to stop putting pressure on women in school to avoid most of them sacrificing education for childbirth. A further study could also be conducted to examine the effectiveness of the coping strategies employed by student-teachers on their academic attainment.

Keywords: Coping, College of Education, Enchi, Female, Pregnancy

I. INTRODUCTION

Pregnancy is a unique experience and a primary social expectation of most women; however, the demand and changes associated with this social expectation and the context within which it occurs can produce high levels of stress and anxiety for expectant mothers. In the African traditional society, most women are prudently prepared and trained to crave motherhood, while others are occasionally hard-pressed to have babies even against their wishes (Lori et al., 2024). Ghanaian society views childbirth as a significant event in a woman's life. As a result, women of the reproductive age are expected to reproduce with or without a legally married husband, making Pregnancy an acceptable occurrence in most tertiary institutions in Ghana (Etuah et al., 2018). Despite this cultural acceptance, pregnant students-teachers in tertiary institutions are required to meet academic standards and requirements. The academic environment can be exceptionally unnerving for young women who become pregnant while in school. When pregnancy-related complications tend to be more enormous (Sedgh et al., 2014), coping with them in an academic environment is demanding and necessitates cautious planning, self-care, as well as support to ensure a successful transition.

Globally, tertiary institutions have become spaces where students engage in several sexual activities (Bryant, 2023). Learners' attempts to fit into campus sexual ethos lead them into unplanned and unexpected Pregnancy. This condition can subsequently lead to emotional and psychological stress, potentially hindering the academic progress of learners due to their inability to cope with academic activities on campus. Women disproportionately balance college activities and parenthood, many without the support of a spouse or partner (Institute for Women's Policy Research, 2014). Pregnancy and school attendance do not go well together, as the former has a detrimental effect on their Education and plans.

According to United Nation Population Fund (UNFPA) Ghana (2020), adolescent Pregnancy in Ghana has been a worrying trend amid the high rate of HIV contraction. They posit that between 2016 and 2020, Ghana recorded 542,131 pregnancies amongst middle and late adolescent young women. Not only are these numbers disquieting, but they are also a crucial concern with lifetime implications for the health, educational attainment, and general well-being of adolescents and society (Gyan, 2013). Most students in higher education institutions in Ghana fall within this age

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category. In communities in Ghana, the experience of resource constraints, Pregnancy among students jeopardizes their Education. The prevalence of Pregnancy and its effects on the academic attainment of young students are of particular interest to the gender equality agenda. Globally, studies have focused mainly on Pregnancy among primary and secondary school students who drop out of school and the prevalence of teenage Pregnancy in Ghana (Morgan et al., 2023; Awuah & Awuku, 2021; Govender et al., 2019). However, little attention has been given to the phenomenon among students' teachers in colleges of Education and the coping mechanisms employed by student-teachers to manage academic environment activities.

With the increasing number of female students in colleges, this study aims to explore the coping strategies of pregnant student-teachers in colleges of Education and to investigate the causes and effects of Pregnancy on academic attainment. Research questions to guide the study are: What are the causes of Pregnancy among student-teachers in the Colleges of Education? What are the effects of Pregnancy on the academic attainment of pregnant student-teachers in college? What are some of the coping strategies employed by pregnant student-teachers in the Colleges of Education?

1.1 Research Objectives

This study was guided by the following objectives:

(i) To find out the causes of pregnancy among student-teachers in the Colleges of Education.
(ii) To examine the effects of pregnancy on the academic attainment of pregnant student-teachers in college.
(iii) To determine the coping strategies employed by pregnant student-teachers in the college of Education.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by the stress and coping theory by Lazarus and Folkman (1984) and Cohen and Wills, (1985) social support theory.

2.1.1 Stress and Coping Theory (Lazarus & Folkman, 1984)

Lazarus and Folkman's model emphasised the interplay of an individual's perceived psychological stress, coping and cognitive appraisal. The theory acknowledges that personal and situational factors as well as availability of social supports influence how people appraise and cope. This probably explains why individuals respond differently to similar situations. According to Lazarus and Folkman (1984), stress occurs when the person or environment relationship is appraised "taxing or exceeding their resources and endangering their well-being" (p. 19). This insinuates that stress is a personal and dynamic process, and the effectiveness of coping is dependent on a person's subjective interpretation and availability of resources.

Lazarus and Folkman identified two types of coping: problem-focused coping and emotion-focused coping. Problem-focused coping involves doing something about the existing problem. This implies that pregnant student-teachers who employs this type of coping strategies are more likely to gather resources about their pregnancy and talk to others to help manage all pregnancy related stressors. Conversely, emotion-focused coping is concerned with one's ability to recognise that if the situation is uncontrollable, then it should be left alone with more focus placed on managing their emotions which can be controlled. The model as employed by the researchers served as a guide to understand the well-being of pregnant student-teachers at the college of education focusing on how they cognitively appraise their conditions and cope with pregnancy related stressors as well as its influence on their academic attainment.

2.1.2 Social support theory (Cohen & Wills, 1985)

The social support theory by Cohen and Wills (1985) suggests that emotional and tangible resources received from one's social network significantly impacts their well-being by aiding assistance during times of stress and promoting good health. This theory categorises social support measures as structural; the extent to which individual participates in relationships and functional; the degree to which such relationships provide identified functions for them. Thus, social supports can improve self-esteem and provide psychosocial support. Adding to this, Feeney, and Collins (2015) indicate that social support is essential in stress alleviation as well as self-management. In their main effect model, Cohen and Wills specifies that social support has a direct effect on well-being and coping. This implies that having a good social support during pregnancy could help individual lead a less stressful life in their academic environment since close and caring relationships are undoubtedly linked to good health and well-being in all spheres of life (Feeney & Collins, 2015). Although, Hughes (2025), affirms that the level and length of exposure to stressors influence anxiety and in turn affect coping, academic performance, and retention; the social support theory reiterates that individuals with strong social relationships tend to have positive impact on well-being regardless of stress level. Draggest (2021) found social support as a predictor of physical and mental health and a buffer that protects people from negative effects of stressful life event. Agreeing to this, the researchers also reiterate that when proper social support is

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given, pregnant student-teachers could find the academic environment less traumatic hence aiding them in their academic attainment.

2.2 Empirical Review

2.2.1 Causes of Pregnancy among Students-Teachers

Pregnancy among women differs from person to person due to varied personal, psychological, and socio-cultural reasons. Ameyaw (2018) studied the commonness and correlates of unintended Pregnancy among 4294 women in Ghana. The study recorded 29.8% overall incidence of unintended Pregnancy, and unintended Pregnancy was high among the 15-19 age cohort. Unlike older women, these young ones are more likely to engage in unplanned sexual activities, hence without any protection, possibly due to peer influence and material gains (Rahman, 2012). This suggests that most pregnancies among female students in higher Education are intended.

According to the Guttmacher Institute, students who received thorough sex education had a 50% lower risk of becoming pregnant early than those who did not. This insinuates that thorough sex education programs should be provided to the youth to equip them with adequate information and skills to make mature decisions concerning their sexual and reproductive life. According to Muneer (2023), media portrayals of early sexual relationships can romanticize early parenthood, which inadvertently normalizes early pregnancies. In addition, Muneer indicates that a lack of parental involvement in adolescent lives can contribute to early pregnancies. When parents are not actively engaged in their ward's life, they tend to seek emotional connection outside the home, which often leads to early sexual activities. Johnson (2023) indicated that most girls, out of youthful exuberance and curiosity, land themselves in an unwanted pregnancy. In addition, the poor financial condition and socioeconomic background of parents compels young girls to engage in immoral acts in their quest to cater for their basic needs in school. PLAN International June (2024) annual review report found that family and social demand for childbirth, discrimination, violence, and early marriage also increase the chances of female students becoming pregnant.

2.2.2 Effects of Pregnancy on Academic Attainment

Pregnancy, regardless of one's age and level, may have a worrying impact on learners' education. Ezenwuba (2015) investigated the perceived effects of Pregnancy on the academic performance of female nursing students in Imo state. It was revealed that physical discomforts emanating from Pregnancy tend to affect their academic performance negatively. Students miss lectures, experience challenges in their study patterns, and struggle with adjusting to motherhood as pregnant students. This suggests that academic progress is hindered as coping strategies and attention span decrease. Thabethe et al. (2020) studied the psychological experiences of pregnant students at the University of Venda in Limpopo Province. They found that many pregnant students are unable to complete their coursework and graduate on time successfully. Pregnant students experienced maternal stress, poor concentration, and anxiety, suggesting that the psycho-social issues that mothering learners must deal with make it undesirable for girls to become pregnant when studying. The fact remains that balancing Pregnancy and academic work is difficult, particularly due to the extra demands of prenatal and antenatal care and its expenses. Huddleston-Casas et al. (2009) studied the challenges and coping experiences of pregnant and parenting students in higher Education and found that pregnant students faced challenges navigating policies around maternity leave. They also faced unique challenges in accommodation, stress, and time management as well as blending personal responsibilities with academic work.

National Conference of State Legislatures (NCSL) of the United States of America study found that in 2013, female college students who experienced childbirth were 65% less likely to complete their degree programmes. Ayornoo and Bonsu (2022) reiterates that Pregnancy has been listed as the primary factor responsible for school dropouts of female students. Pregnant students drop out due to low self-esteem, isolation, and psychological effects, which make them skip classes, miss assignments, and exams, resulting in poor academic performance. Some college tutors maltreat and embarrass pregnant student teachers (Ayornoo & Bonsu, 2022). The effects of pregnant female students led the Zimbabwe community to expect female learners to complete high school and tertiary Education before starting a family (The Saturday Herald cited in Ezenwuba, 2015). It is more difficult for expectant mothers due to the higher rates of postpartum depression and emotional distress owing to early parenthood.

Pregnancy can negatively affect female students' academic performance. It is evidenced that pregnant students experience social stigma and other psycho-social issues, such as maternal stress, anxiety, and low self-esteem, leading to poor academic outcomes.

2.2.3 Coping Strategies of Pregnant Student-Teachers in Colleges of Education

Dabone et al. (2022) evaluated the stress-coping mechanisms used by pregnant women. They discovered that talking to a friend or family member was the most common coping mechanism employed by expectant mothers in the educational institutions. Nordzi et al. (2022) explored the challenges faced by pregnant students at the University of Education, Winneba, and strategies for supporting them. They found that pregnant students used avoidance coping mechanisms. To determine Pregnancy coping styles in healthy pregnant women, Borcherding (2015) identified prayer

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and task as the most frequently used coping strategies. Phiri et al (2021) also found emotion-focused and problem-focused strategies as coping strategies employed by pregnant women to deal with stressors confronting them during and after their pregnancy.

Esia-Donkor et al. (2014) investigated the challenges faced by pregnant students at the University of Cape Coast. They found that emotion-based coping strategies were the most adopted to deal with these challenges. Guardino and Schetter (2013) conducted a study on coping behaviours and coping styles during Pregnancy. They found that most pregnant women resorted to an avoidant coping style due to postpartum depression. Generally, stress is a common experience during Pregnancy, particularly when combined with academic work; however, it can be reduced by adopting effective coping strategies, seeking support, and practicing self-care.

III. METHODOLOGY

3.1 Research Design and Approach

The explorative design was used for the study due to it flexible and adaptable nature. This design helped the researchers to gain deeper understanding of the phenomenon under study. A qualitative research approach, supported by the interpretive model, was also employed in the study. The target population for the study was all pregnant student-teachers of Enchi college of education in the eighth week and beyond of pregnancy as at the time of data collection. Since this was the time, most pregnant student-teachers begin antenatal care.

3.2 Sampling Strategy

A sample size of fifteen (15) participants were selected based on the criteria outlined by Cohen, et al (2017) which stipulates that it takes 12 to 25 responses to reach saturation in qualitative interview. The purposive sampling technique was employed, as the research focused on pregnant student-teachers only. Although it is often criticized for its lack of generalizability and susceptibility to researcher bias, purposive sampling offers advantages like cost efficiency, flexibility and the ability to target information rich cases.

3.3 Data Collection

A semi-structured interview guide was used as the data collection instrument for the study. Each interview lasted for 20-35 minutes and was recorded and documented. To ensure consistency during the interview, the researcher developed an interview protocol (Durdella, 2019), which included informed consent and a sequence of questions. The protocol began with easier-to-answer questions and progressed to in-depth questions that allowed participants to elaborate on their responses and confirm their answers.

3.4 Data Analysis

Data was analysed thematically based on the stated objectives and in response to the research questions formulated for the study.

3.5 Ethical Considerations

To ensure anonymity and confidentiality, dummy names were used throughout the reporting. Data gathered was protected from unauthorised access, disclosure and misuse. Participants were also fully informed about the research's purpose and as well had the right to withdraw from the study at any given time. Participation in the study was voluntary and free from coercion and undue influence.

IV. FINDINGS & DISCUSSION

This section presents the findings and discussions of the study based on the objectives stated for the study. The study explored the prevalence of pregnancy among student-teachers in Enchi college of Education, how pregnancy status of students-teachers affects their academic attainment in the college, and also to determine the coping strategies employed by these students.

4.1 Causes of Pregnancy among Students-Teachers in Enchi College of Education

The study findings indicated that the causes of Pregnancy among student-teachers in the College are that pregnant student-teachers are not expelled from the College; a request from their mothers; and the long duration of the study. It was pleasing to have a child(ren) since even younger children in society were giving birth. Finally, the study found that female student-teachers used Pregnancy as a means of securing a relationship with their partners while in school. Most respondents echoed that they had planned their pregnancies, although they were not married. This contradicts the findings by Sekgobela (2008) that most expectant mothers in academic environments do not plan their pregnancies. Some participants mentioned that they wanted to have a child (or children) before completing their studies

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at the College. They added that at least their mothers are strong enough to take care of their new born as they schooled. This presumed that pregnant student-teachers had social support from families providing care and comfort to aid them cope with pregnancy stressors and maintain good health. This supported Lazarus and Folkman's model that indicated that stress occurs when the environment is appraised as strenuous and endangering the individual's well-being. The findings also espoused PLAN International (2024) that the prevalence of Pregnancy among adolescents includes family, community, and social pressure and the desire to compensate for the loss of a child. The majority further indicated that they were mature enough to give birth. While others mentioned they got pregnant to trap their "boyfriends" for marriage. Though some respondents reported that their Pregnancy took them by surprise, occurred due to miscalculation of menstrual cycle and due to contraceptive failure, which buttresses the assertion by Ameyaw (2018), it can be concluded that Pregnancy among college student teachers is properly planned.

4.1.1 Planned and intentional Pregnancy

Under this theme, some respondents had this to say.

> *I felt like getting pregnant because anytime I see my mates giving birth, I admire it and desire to have at least one child while in school* (**Student 9**)

A participant narrated that:

> *Hmmm! I do not have any planned motive for getting pregnant. I realized I had missed my period and did not want to abort, so I had no option but to keep the Pregnancy and give birth.* (**Student 8**)

Another student teacher said:

> *I feel that I am ageing, so I must give birth even though I am not married. After all, when I start working after school, I will be able to take care of myself and the child, even if my baby's father fails to do so.* (**Student 10**)

4.1.2 Society and Family Pressure

Another student-teacher also narrated that:

> *I do not want to be like my big sister, who waited for so many years and later could not give birth even after getting married.* (**Student 12**)

One respondent also mentioned that:

> *My mother told me that she wants her grandchildren, and that once I have a serious boyfriend, I can have a baby, so she can take care of it while I am still in school, because I cannot spend all my years in school without thinking about having a child.* **(Student 2)**

Another respondent said:

> *At first, I learnt that when you get pregnant while in college, you will be sacked, so I did not want to, but now that you can get pregnant and continue your studies, I want to give birth so my mum can take care of them while I am in school.* (**Student 15**)

4.2 Effects of Pregnancy on the Academic Attainment and Performance of Student Teachers in Enchi College of Education.

The majority of the respondents indicated some level of difficulty in combining Pregnancy with studies. Respondents admitted that some colleagues had been referred or given supplementary papers to write after Pregnancy, and respondents admitted that they could have gotten better grades had it not been for Pregnancy. This suggests that, although hectic, pregnant students-teachers in colleges try to meet the demands of the academic environment, thereby maximizing learning. Most respondents mentioned that frequent antenatal care visits and ailments also led to missing some academic activities, such as lectures and Supported Teaching in School (STS). Although respondents received peer teaching at times, the explanations are not exhaustive, as they are not as detailed as those of the lecturer. This compelled them to do extra work to meet the academic requirements of the College. Again, pregnant student-teachers mentioned a reduction in the duration of personal studies due to frequent tiredness. Below are some of the responses from the participants.

> *I am unable to attend Antenatal care regularly because that is also the time we go for a Supported Teaching in School (STS) visit, and I do not want to miss it.* (**Student 3**)
>
> *Schooling and Pregnancy, 'de3, saaaa'- it is not easy, but I have gone for it, so I must bear it. Most of the time I feel very uncomfortable being around even my friends, and I talk less about going to study with them.* (**Students 5**)
>
> *I have been missing some of my lectures because I have been getting sick regularly and will have to go to the hospital. Also, I used to have group discussions with my friends, but now I can't because when I sit down for long, I begin to have swollen feet and experience severe abdominal pains. So, I am most of the time in the room lying on the bed.* (**Students 11**)

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Hmmmm! Combining Pregnancy with academic work has not been easy for me at all. I mostly feel depressed and stressed up, especially in this environment where you cannot even get a good sleep because of the nature of the bed in the dormitory. Sometimes I feel like I should defer my program and reapply after birth. It is not easy, madam. (**Student 4**)

4.3 Coping Strategies of Pregnant Student-Teachers

Analysis of data on the coping strategies employed by pregnant students-teachers in the academic environment emerged that, they pretend they do not care regardless of the derogatory words and comments used by colleagues and tutors. They also employed suppression to focus on their academic work. It was established that student-teachers develop self-motivation and remain focused on their academics since there was nothing, they could do about their condition but to endure. Some respondents reported receiving support from their mothers. These findings aligned with Phiri et al (2021) who found emotion-focused and problem-focused strategies as coping strategies employed by pregnant women to deal with stressors confronting them during and after their pregnancy.

One of the pregnant student-teachers said that:

Madam, I snub what they say, laugh over it, and take it as a joke even though when I go to the dormitory, I think about it. Sometimes I must act as if nothing is wrong with me to be able to focus on my studies. (**Student 1**)

Another student also said that:

Oh! I usually ignore some of the things they say, even though it mostly hurts. I only encourage myself that perhaps they have no idea of what I am going through with my Pregnancy. (**Student 13**)

One respondent narrated that:

At times, I feel embarrassed by comments like "you do not sleep at night, look at what you have brought to yourself" made by some of the tutors, which make it difficult for me to concentrate during lectures for the whole day. However, I have to let go and behave as if all is well. (**Student 7**)

Well! My mother told me that it is a normal experience for every pregnant woman to go through some form of pain and stress, and that after 9 months everything will be over. (**Student 6**)

The findings suggest that pregnant student-teachers in Colleges of Education use suppression as their coping strategy to help them remain focused in their academic environment. In line with Sincero's (2012) and Kotoh et al.'s (2022) assertion, individuals who tend to suppress challenges often cope with stress by denying or minimizing its existence. It was also established that pregnant student-teachers use silence as a coping strategy since they prefer not to share their challenges with others. This strategy, they indicated, has been one of the most effective coping strategies, thereby confirming the assertion by Nordzi et al. (2022) that concealment is often beneficial for individuals under stress. Agreeing with Lazarus and Folkman (1984) emotion-focused coping, student who recognizes to have little or no control over their pregnancy related stressors tend to leave it as it and endure the consequences. Additionally, the researchers believe that ignoring specific derogatory comments from individuals and society in general can often help minimize stress in school. Some of them had this to say:

Sometimes, even when I am not well, I keep it to myself and pretend to be okay. It is better to keep your problem to yourself than to share it with someone, and then go and tell somebody. (**Student 5**)

Hmmm! I do not feel comfortable telling people about my problem; I would rather keep it to myself. Because I do not know what the person also has in mind, I will not reveal it to the person. They may sometimes pretend to share your sentiment, but in your absence, they will speak negatively about you. (**Student 14)**

There was some reported evidence of a few situations in the current study, as some respondents indicated that the attitudes of their colleagues and tutors towards them were generally positive, while others described it as usual. And that these positive attitudes helped them in performing their academic responsibilities. This could be due to the effective GESI Committee at the College, which often sensitizes students to the need to create a positive learning environment for all learners, regardless of their condition. This finding affirmed Cohen and Wills (1985) social support theory that emotional and tangible resources received from one's social network significantly impacts their well-being by aiding assistance during times of stress and promoting good health. More so, Feeney and Collins (2015) assertion that social support is essential in stress alleviation as well as self-management was supported. One student said that:

Oooh! My roommates are very nice to me. Sometimes they get me food to eat when I find it difficult to go out for dining. There is one lady in my room who even washes my things for me, mostly when she is washing hers. **(Student 7)**

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Pregnancy is a primary social expectation of most women; however, coping with it in an academic environment necessitates cautious planning, self-care, and support to ensure a successful transition since pregnant students are required to meet academic standards and requirements while in school. It is evidence that student teachers in colleges of education plan and intend their Pregnancy. Also, student teachers opine that the stress of Pregnancy affects academic performance negatively and can also extend study duration. Finally, they use I do not care, avoidance, and suppression as coping strategies.

5.2 Recommendations

The study recommended that this study be replicated at other colleges of Education, and future studies could also highlight the importance of supportive policies and resources for pregnant students in colleges of Education in Ghana. And, to examine the effectiveness of the coping strategies employed by student-teachers on their academic attainment. Society should also be sensitized to stop putting pressure on women in school to avoid most of them prioritizing childbirth over academic attainment. It is further recommended that pregnant student-teachers should seek for more proper social support to help them adjust to pregnancy related stress, hence aiding their academic attainment.

REFERENCES

Ameyaw, E. K. (2018). Prevalence and correlate of unintended pregnancy in Ghana: Analysis of 2014 Ghana demographic and health survey. *Maternal Health, Neonatology, and Perinatology, 4*, 17. https://doi.org/10.1186/s40748-018-0085-1

Awuah, D., & Awuku, A. S. (2021). Teenage pregnancy and its implications for adolescents' mental health in Ghana. Retrieved from https://www.ghanaweb.com/GhanaHomePage/features/Teenage-pregnancy-and-its-implications-for-adolescent-mental-health-in-Ghana-1302949

Ayornoo, D. D., & Bonsu, F. M. (2022). Academic challenges facing pregnant students at the Ada College of Education. *E-Journal of Humanities, Arts and Social Sciences, 3*(8), 286–298. https://doi.org/10.38159/ehass.2022381

Borcherding, K. E. (2015). Coping in healthy primigravidae pregnant women. *Journal of Obstetric, Gynecologic and Neonatal Nursing, 38*(4), 453–462. https://doi.org/10.1111/j.1552-6909.2009.01041.x

Bryant, J. (2023). Pregnant in college: What you need to know. Retrieved from https://share.google/SSRVciRikPtRPudum (Accessed on March 28, 2025).

Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education* (8th ed.). Routledge. https://doi.org/10.4324/9781315456539

Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin, 98*, 310–357.

Dabone, K. T., Yeboah, G., Poku, A. E., & Bossman, F. I. (2022). Stress coping strategies adopted by pregnant students in the University of Cape Coast and their implications for counselling. *International Journal of Advanced Research, 10*(7), 497–505. https://dx.doi.org/10.21474/IJAR01/15064

Drageset, J. (2021). Social support. In G. Haugan & M. Eriksson (Eds.), *Health promotion in health care – Vital theories and research* (pp. 169–184). Springer Cham. https://doi.org/10.1007/978-3-030-63135-2_11

Durdella, N. (2019). *Qualitative dissertation methodology: A guide for research design and methods*. SAGE Publications, Inc.

Esia-Donkor, K., Esia-Donkor, K., & Asare, H. (2014). Coping in silence: Challenges faced by pregnant students at the University of Cape Coast, Ghana. *International Journal of Education and Practice, 2*(1), 222–233.

Etuah, P. A., Gbagbo, F. Y., & Nkrumah, J. (2018). Coping with pregnancy in an academic environment: Experiences of pregnant students in public universities in Ghana. *Journal of Women's Reproductive Health, 2*(2), 1–12. https://doi.org/10.14302/issn.2381-862x.jwrh-18-2090

Ezenwuba, C. (2015). Perceived effect of pregnancy on the academic performances of female nursing students in Imo State University, Owerri. *South American Journal of Academic Research, 2*(1), 1–27. Retrieved from https://www.texilajournal.com/academic-research/article/133-perceived-effects-of-female-nursing-students-in-imo-state-university

Feeney, B. C., & Collins, N. L. (2015). A new look at social support: A theoretical perspective on thriving through relationships. *Personality and Social Psychological Review, 19*(2), 113–147. https://doi.org/10.1177/1088868314544222

Govender, D., Naidoo, S., & Taylor, M. (2019). Prevalence and risk factors of repeat pregnancy among South African adolescent females. *African Journal of Reproductive Health, 23*(1), 73–87.

Licensed Under Creative Commons Attribution (CC BY-NC)

Guardino, C. M., & Schetter, C. D. (2013). Coping during pregnancy: A systematic review and recommendations. *Health Psychology Review, 8*(1), 70–94. https://doi.org/10.1080/17437199.2012.752659

Gyan, C. (2013). Effects of teenage pregnancy on the educational attainment of girls at Chorkor, a suburb of Accra. *Journal of Educational and Social Research, 3*(3), 53–60. https://doi.org/10.5901/jesr.2013.v4n3p53

Huddleston-Casas, C., Charnigo, R., & Simmons, L. A. (2009). Food insecurity and maternal depression in rural, low-income families: A longitudinal investigation. *Public Health Nutrition, 12*(18), 1133–1140. https://doi.org/10.1017/S1368980008003650

Hughes, J. G. (2025). The S triple G traits—essential traits for students. *Immunology and Cell Biology, 103*(4), 337–340. https://doi.org/10.1111/imcb.70001

Institute for Women's Policy Research. (2014). Millions of college students are raising children. Fact sheet. Retrieved from https://www.iwpr.org

Johnson, G. E. (2023). Causes of teenage pregnancy and its effects. Retrieved from https://www.modernghana.com/news/1223348/causes-of-teenage-pregnancy-and-its-effects.html (Accessed on January 14, 2024).

Kotoh, A. M., Sena-Amekudzie, B., Opoku-Mensah, K., Baku, E. A., & Glozah, F. N. (2022). Pregnant adolescents' lived experiences and coping strategies in a peri-urban district in Southern Ghana. *BMC Public Health, 22*, 901. https://doi.org/10.1186/s12889-022-13318-2

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. Springer.

Lori, J., Kukula, V., Liu, Apetorgbor, V. E. A., Ghosh, B., Awini, E., Lockhart, N., Amankwa, G., Zielinski, R., Moyer, C. A., & Williams, J. (2024). Improving health literacy through group antenatal care: Results from a cluster randomized controlled trial in Ghana. *BMC Pregnancy and Childbirth, 24*(37), 1–9. https://doi.org/10.1186/s12884-023-06224-x

Morgan, A. K., Ibrahim, R., Owusu, A. F. S., Awafo, B. A., Quartey, T., Aziire, M. A., Katsekpor, J. T., Owusu, S. A., & Katey, D. (2023). Prevalence and associated factors of school re-entry among teenage mothers in Ghana's Volta Region: A cross-sectional survey. *International Journal of Adolescence and Youth, 28*(1), 160–177. https://doi.org/10.1080/02673843.2023.2242476

Muneer, I. (2023). Early teenage pregnancies: Causes, impacts, prevention strategies, and supports for young parents. Retrieved from http://medium.com/@Iqramuneer/early-teenage-pregnancies-causes-impacts-prevention-startegies-and-support-for-young-parents-85e3048e4791

Nordzi, Dusu, S., & Kusi, H. (2022). Challenges faced by pregnant students at the University of Education in Winneba, Ghana, and strategies for supporting them. *International Journal of Research and Innovation in Social Science, 6*(4), 268–272.

Phiri, T. M., Nyamaruze, P., & Akintola, O. (2021). Stress and coping among unmarried pregnant university students in South Africa. *BMC Pregnancy and Childbirth, 21*, 1–13. https://doi.org/10.1186/s12884-021-04288-1

PLAN International. (2024). Teenage pregnancy. Retrieved from https://share.google/iH8PA1Vhy5AQvPMmym (Accessed on August 20, 2025).

Rahman, M. (2012). Women's autonomy and unintended pregnancy among currently pregnant women in Bangladesh. *Maternal and Child Health Journal, 16*, 1206–1214. https://doi.org/10.1007/s10995-011-0897-3

Sedgh, G., Singh, S., & Hussain, R. (2014). Intended and unintended pregnancies worldwide in 2012 and recent times. *Studies in Family Planning, 45*(3), 304–314. https://doi.org/10.1111/j.1728-4465.2014.00393.x

Sekgobela, C. B. (2008). Pregnancy related challenges encountered by student nurses at the South African Military Health Services Nursing College (Unpublished master's dissertation). Pretoria University, South Africa.

Sincero, S. M. (2012). Physiological stress response. Retrieved from https://www.explorable.com/physiological-stress-response

Thabethe, L. R., Mulondo, S. A., & Tugli, A. K. (2020). Psychological experiences of pregnant students at the University of Venda, Limpopo province, South Africa. *African Journal of Reproductive Health, 24*(3), 18–23. https://doi.org/10.29063/ajrh2020/v24i3.2

UNFPA. (2020). Adolescent pregnancy: A matter of human rights. Retrieved from www.unfpa.org/adolescent-pregnancy#readmore-expand

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Perception of members of county assembly on participatory communication in the budget-making process: A case of Makueni County, Kenya

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ABSTRACT

The research sought to understand the perceptions of Members of County Assembly (MCAs) on participatory communication in the budget-making process within the context of Makueni County, Kenya. This study is also based on the context of the 2010 Constitution that institutionalized public participation as a core principle of governance. While Makueni County's reputation is picked as a pioneer in participatory governance, limited attention has been paid to MCAs' perception of the effectiveness of communication methods that facilitate citizen involvement in budget decisions. The study was anchored on both public sphere and deliberative democracy theories, which posit that citizen engagement is driven by perceived influence, access to information, and accountability. The study adopted a pragmatic mixed-methods design combining surveys and interviews. A census of 47 MCAs was targeted, with an 85.1% response rate, supplemented by key informant interviews with county officials and civil society representatives. Quantitative data were analyzed using descriptive and inferential statistics, while qualitative data underwent thematic analysis. Findings of the study revealed that public barazas (community meetings) dominated as the primary communication method (52.5%), with broader combinations including stakeholder forums and social media platforms, as well as surveys employed to varying degrees. The regression analysis indicated that while stakeholder engagement was positively associated with effective budget outcomes ($\beta=0.219$, $p<0.05$), overreliance on existing participatory methods had a weak negative relationship with effectiveness ($\beta=-0.257$, $p<0.01$), signaling the need for diversification of approaches. The study noted that MCAs generally rated participatory methods as effective (90%), citing inclusivity of youth and marginalized groups, timely consultations, and regular updates through multiple channels; however, digital platforms were found to be significantly underutilized (75% agreed), civil society and private sector actors were minimally engaged, and feedback mechanisms, though present, required strengthening. The researchers concluded that while participatory communication has enhanced inclusivity, transparency, and dialogue in Makueni's budget-making process, critical gaps persist in digital adoption, stakeholder diversity, and communication effectiveness. The study further recommends broadening stakeholder representation to include civil society and private sector actors, strengthening digital infrastructure and MCA training to expand citizen outreach, and improving feedback systems to ensure citizens' inputs are acknowledged and acted upon, thus advancing inclusive and equitable as well as accountable budget governance.

Keywords: Budget-Making, Kenya, Makueni County, Members of County Assembly (MCAs), Participatory Communication, Stakeholder Engagement

I. INTRODUCTION

The modern governance has increasingly emphasized participatory approaches to decision-making, recognizing the need for inclusivity, transparency, and accountability. In Kenya the Constitution of 2010 revolutionized governance by mandating public participation as a core principle, particularly in devolved units such as county governments. Budget-making process in the new Kenyan constitution dispensation is a critical component of county governance, requires active engagement between the Members of County Assembly (MCAs), stakeholders, and the public to ensure equitable resource allocation and effective service delivery (Hao et al., 2022). Participatory communication, which involves the active exchange of information, ideas, and feedback between stakeholders, is fundamental in achieving this goal.

Globally, some scholars have reviewed participatory communication approaches in governance. For instance, Gilman, (2016) in "*Democracy Reinvented: Participatory Budgeting and Civic Innovation in America*," surveyed how participatory budgeting empowers citizens to identify community needs, collaborate with elected officials to develop budget proposals, and vote on the allocation of public funds. The author situates this process within the broader context of U.S. democracy, highlighting its potential to enhance civic engagement and address citizen disaffection and mistrust in government. Through theoretical insights, case studies, and interviews, Gilman presents participatory budgeting as a compelling alternative to traditional democratic practices, aiming to build a more empowering model of governance. Gilman (2016), and supported by Baiocchi and Ganuza (2014), all in USA and Europe, note that

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participatory communication involves key principles like dialogue, where stakeholders share information, opinions, and perceptions, leading to mutual understanding and collective decision-making. Additionally, Wampler et al. (2021) in a global perspective of participatory communication notes that participation of stakeholders is a key component in budgeting process, along with empowerment of the public through allowing individuals to take control of their development, while promoting self-reliance and confidence.

Further in Europe (especially in Spain) and America, Baiocchi and Ganuza (2014) perform a meta-analysis of literature review and peer-scholarly studies on participatory budgeting (PB). The authors note that PB is not instituted in at least 1,500 cities across the world, with its central features being the yearly cycles of budgeting, open meetings, and the combination of representation and deliberation. The authors noted for more careful consideration of some of its least known features like managing stakeholders' meetings and exercise of power in decision-making, which might lead to emancipation of citizens. Correspondingly, Wampler, et al. (2021) in their work titled "Participatory Budgeting in Global Perspective," analyzed the worldwide adoption and impact of participatory budgeting (PB) programs. They identify six distinct PB models, each varying in design and outcomes, to account for the diverse implementations across different contexts. The researchers offered a comprehensive examination of PB's potential to enhance civic engagement, promote social justice, and improve governance outcomes globally. In addition, Wampler et al. (2021) cite practices like community engagement, use of diverse media like traditional media, face-to-face interactions, and digital platforms to reach a broader audience and also accommodate different preferences. The study insisted on the importance of feedback mechanisms and capacity building for the public to make public participation successful.

Preceding studies highlight varied experiences in citizen participation in public budgeting across different contexts. Smith (2015) investigated electronic participation in Georgia, USA, showing growing use of social media in local government budgeting but with low prioritization by officials. In addition, Yadamsuren (2006) in Mongolia found that weak regulation, poor awareness, and limited communication hindered citizens' involvement in local budgeting. Locally in Kenya, Ogoti et al. (2024) in Nyeri County established that social and print media significantly influenced public participation, while radio had minimal impact, with education and awareness shaping outcomes. The reviewed studies reveal geographical, methodological, and theoretical gaps that justify further exploration in Makueni County.

The study used the theory of participatory communication in budget-making explains citizen engagement as driven by perceived benefits such as influence, accountability, access to information, and improved services (Johannessen & Collins, 2024). The study highlighted the government's role in creating transparent, mutually beneficial communication channels that foster legitimacy and ownership in governance. Public feel empowered when their voices shape decisions, reflecting social exchange dynamics where individuals seek to maximize rewards and minimize costs. This framework directly supports the study's objectives by linking citizen participation to impacts and challenges in county-level budget processes (Berger & Webster Jr, 2018).

The Constitution of Kenya 2010 institutionalized public participation as a legal and operational requirement for governance processes, including budget-making. The County of Makueni has emerged as a notable case in the implementation of participatory governance, setting an example in the inclusion of citizens in budgetary decisions. Members of County Assembly (MCAs) play a vital role in this process by serving as intermediaries between the county government and the public. Their perception of participatory communication significantly influences the effectiveness of stakeholder engagement and the transparency of budget decisions.

The county of Makueni is regarded as a trailblazer in participatory governance, presents a unique context for examining the integration of participatory communication in budget-making. The county has been lauded for its progressive approach to citizen engagement and transparent governance. Nevertheless, the perceptions of MCAs, key actors in the budget process, regarding the effectiveness of participatory communication remain understudied. The MCAs views are critical as they play a pivotal role in representing constituents, facilitating stakeholder involvement, and overseeing the budget process.

Hao et al. (2022) note that participatory communication enables the active exchange of information, ideas, and feedback between government institutions and stakeholders. In the context of Makueni County, the county assembly serves as a critical link between the executive and the citizens, facilitating communication during budget preparation. Muthomi (2024) notes that various methods, including public forums, media outreach, and digital platforms, are used to engage stakeholders. The effectiveness of the participatory methods in ensuring inclusivity, awareness, and informed decision-making is a primary focus of this study and how it influences decision-making at the county executive levels.

This journal paper sought to discover the perception of Members of County Assembly on participatory communication in the budget-making process in Makueni County government. The research was guided by two objectives including: exploring the participatory communication approaches used by Makueni County Assembly during the budget-making process; as well as to evaluate the level of stakeholder engagement facilitated by Members of Count Assembly on participatory communication in the budget-making process.

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1.1 Statement of the Problem

The County of Makueni continues to face challenges in achieving an inclusive, transparent, and responsive budget-making process despite its reputation for innovation in public participation. While Kenya's Constitution mandates citizen involvement in governance, participatory communication within counties often remains inconsistent and superficial, hindered by factors such as political interference, limited capacity of MCAs, inadequate feedback mechanisms, and communication barriers. These shortcomings have resulted in weak stakeholder engagement and inefficiencies in resource allocation. Moreover, little is known about how Members of County Assembly (MCAs) perceive participatory communication and its influence on transparency and effectiveness in budgeting. This study therefore seeks to bridge this gap by exploring MCAs' perceptions of participatory communication in Makueni County to enhance accountability, efficiency, and inclusive governance in the budget-making process.

1.2 Research Objectives

The following were the research objectives:

(i) To explore the participatory communication methods used by Makueni County Assembly during the budget-making process.

(ii) To assess the level of stakeholder engagement facilitated by Members of Count Assembly on participatory communication in the budget-making process.

II. LITERATURE REVIEW

2.1 Theoretical Review

The following were the theories used in the study. First is the Public Sphere Theory proposed by Jürgen Habermas (1962) provides a foundation for understanding participatory communication in democratic processes. It emphasizes the existence of a public domain where citizens engage in rational-critical debate to influence political decisions and ensure government accountability. This model accentuates key elements such as inclusivity, deliberation, autonomy, and the media's role in facilitating discourse. Critics, including Nancy Fraser and Adut, as observed by Arendt et al. (2010), argued that Habermas's model is overly idealistic and excludes marginalized voices, while modern interpretations incorporate digital platforms as new public spheres for engagement. For the context of Makueni County, this model explains how participatory communication enables citizens to debate budget priorities, hold leaders accountable, and enhance transparency in governance.

Secondly, there is the Deliberative Democracy Theory by Young (2001) which builds upon Habermas's ideas, emphasizing inclusive, reasoned, and respectful dialogue in decision-making. It views legitimacy in democracy as dependent on citizens' active participation in discussions that shape collective outcomes. Core principles include equality, transparency, public reasoning, and consensus. The theory has critics like Mouffe and Curato as mentioned by Szklarska (2020) highlighted that the theory assumes overly rational participants and may overlook emotional and power dynamics that affect inclusivity. Despite these challenges, the theory is relevant to participatory communication because it explains how platforms like public forums and social media can foster dialogue between citizens and policymakers. In Makueni County, this framework supports understanding of how deliberative spaces enable informed contributions to budget-making processes.

2.2 Empirical Review

2.2.1 Participatory Communication and the Budget-Making Process

Some studies have examined how participatory communication act as a catalyst for inclusive and transparent budget-making processes across global and local contexts. Chapman (2021) found that participatory technologies in Russia enhanced elite-mass communication, increasing government approval through inclusive dialogue, though contextual and methodological limitations may affect transferability to democratic settings like Kenya. In addition, Muthomi (2024) in Oregon, USA, noted that government officials increasingly used hybrid approaches, social media and traditional forums, to foster participatory budgeting, emphasizing adaptability and inclusivity. Further, Al Hudithi (2017) in Saudi Arabia demonstrated that participatory communication grounded in social capital fostered efficient budgeting decisions by improving information exchange within organizations. Likewise, Lorsuwannarat (2017) in Thailand underscored public participation as a reformist tool for improving decision-making at multiple government levels. Collectively, these studies affirm that participatory communication promotes transparency and citizen trust, though contextual factors such as governance systems, institutional capacity, and communication culture influence outcomes.

Further, Sintomer et al. (2012) linked participatory budgeting to deliberative democracy, emphasizing civic engagement as central to participatory modernization, whereas Shomary and Mbuti (2022) in Tanzania found that participatory communication improved administrative efficiency and budget outcomes at the municipal level. In

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Kenya, Gachoka (2021) highlighted that participatory forums in Makueni County strengthened trust between citizens and leaders, making the budget-making process more inclusive and responsive. Generally, these studies converge on the importance of participatory communication in enhancing citizen engagement, but they reveal gaps regarding how elected leaders, as opposed to administrators or civil servants, utilize participatory communication to influence budget-making processes in Kenyan counties.

2.2.2 Participatory Communication Methods, Citizen Engagement, and Budgetary Decisions

Research shows that the methods and media used in participatory communication substantially affect citizen engagement in budgetary decision-making. For instance, Smith (2015) found that electronic participation tools like social media enhanced transparency and dialogue in local governments in Georgia, USA, though government prioritization of such tools remained relatively low. Yadamsuren (2006) in Mongolia observed limited citizen awareness of participatory channels, resulting in low participation in local budgeting. On the contrary, Ogoti et al. (2024) in Nyeri County established that social and print media significantly influence participation levels, with social media emerging as a stronger predictor of engagement than radio. Similarly, Keshine (2018) in Laikipia found that communication barriers such as limited access to newspapers and meeting venues reduced participation effectiveness, while effective information sharing and consultation improved inclusivity.

Locally in Kisii County, Agalo et al. (2018) emphasized that social media platforms like WhatsApp and Facebook enhance participatory communication, although government preference for traditional media limits their reach. In addition, Juma et al. (2023) further demonstrated that WhatsApp messaging facilitates accessible and real-time public participation in Migori County's budget processes, albeit challenged by high internet costs and coordination issues. Njiru (2020) also established that participatory communication platforms in counties like Makueni increased inclusion of marginalized groups in budget decision-making. Collectively, these studies reveal that the method and medium of participatory communication determine citizen engagement quality and inclusivity. However, there remains a research gap in assessing the interplay between communication strategies, technological adoption, and citizen responsiveness in county-level budgeting in Kenya.

III. METHODOLOGY

The section provides the methodology used, which outlines the research design, methods, and ethical considerations for the study on MCAs' perceptions of participatory communication in Makueni County's budget-making process. This research embraced a pragmatic mixed-methods approach, integrating quantitative and qualitative data through surveys and interviews. Further, a descriptive cross-sectional design was used to capture perceptions at a specific point in time, focusing on participatory communication mechanisms, impacts on transparency, levels of stakeholder engagement, accountability, as well as barriers to effective participation.

The research was done in Makueni County, well-known for its innovative public participation practices, making it an ideal case for examining participatory communication in governance. The target population was about 47 elected as well as nominated MCAs, supplemented by key stakeholders such as the governor, clerk of the assembly, budget officers, and civil society representatives for triangulation. The researcher embraced a census approach was adopted due to the relatively small size of the population, which ensured diverse perspectives were captured expansively.

The information was collected using structured questionnaires, semi-structured questionnaires, as well as key informant interview guides. The questionnaires had both closed-ended as well as open-ended questions, organized around the research objectives, and employed a 5-point Likert scale to measure perceptions. Key informant interviews were used to enrich qualitative insights. Further, validity was ensured through expert reviews and pre-testing in Machakos County, while reliability was tested through a pilot study and Cronbach's alpha analysis. In qualitative data, validity and trustworthiness was boosted through triangulation.

Quantitative data, the researcher embraced descriptive and inferential statistics such as chi-square tests and linear regression, processed through Excel, while qualitative data was subjected to thematic analysis. The researcher embraced ethical principles like informed consent, anonymity, confidentiality, voluntary participation, and adherence to approvals from NACOSTI and county authorities were strictly observed. This ensured that the study maintained academic rigor, integrity, and respect for participants' rights.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

The study targeted 47 MCAs for the questionnaires, where 40 of them managed to successfully fill and return the questionnaires. This translated to 85.1% response rate. According to Mugenda and Mugenda (2003), a response

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rate of above 60% is considered adequate depending on the nature of study and respondents, hence the response rate was considered adequate for further analysis of the data. The summary is shown on table 1.

Table 1

Response Rate

Targeted Population	Responses	Response Rate
47	40	85.1%

4.2 Demographic Characteristics of the Respondents

The section shows the demographic characteristics of the respondents (MCAs).

Table 2

Demographic Characteristics of the MCAs

Variable	Category	Frequency	Percent
Gender	Female	13	32.5
	Male	27	67.5
Years in office	1 to 3 years	19	47.5
	4 to 5 years	1	2.5
	Above 5 years	20	50
Levels of Education	Diploma	5	12.5
	Postgraduate	21	52.5
	Undergraduate	14	35

The findings show that most of the respondent MCAs were man (67.5%, n=27) while the remaining 32.5% were women. This could be a reflection that the county has well balanced representation, where the constitution of the MCAs meets the third gender rule. Further, the representation enables the researcher to make interpretations based on the balanced sampled respondents. In relation to the years in office, there were half (50.0%, n=20) of them who were serving over five years in office, indicating they were at least in their second term of service or probably third term. Having served more than one term, they were assumed to have experience and expertise in participatory communication methods and their impacts in accountability and making informed budgetary decisions. There were another 47.5% of the respondents who had served for about one to three years, indicating they were the first time MCAs. Lastly, there was 2.5% (n=1) of the respondents serving between 4-5 years, indicating the possibility of having served in the last county assembly through a by-election. The years served by MCAs shows experience in using participatory communication methods in budgeting processes.

In relation to the education levels, a significant number of MCAs at 52.5% (n=21) had postgraduate education while 12.5% had diploma as their highest level of education. Further, another 35.0% had undergraduate level as their highest level of education. This meant that most of the MCAs had higher education to understand the concepts of participatory communication and its influence in budget-making processes. Further, it can be observed that most MCAs were educated and therefore assumed that the concept was well known to them.

4.2 Participatory Communication Methods Used for Budget-Making Process

The participatory communication methods commonly used by MCAs for budget-making processes were as shown on Table 3.

Table 3

Participatory Communication Methods

Participatory communication method	Frequency	Percent
Public barazas (meetings)	21	52.5
Public barazas (meetings) & Social media platforms	2	5
Public barazas (meetings) & Stakeholder forums	1	2.5
Public barazas (meetings); Stakeholder forums, & Social media platforms	9	22.5
Public barazas (meetings); Stakeholder forums; Social media platforms; Surveys and questionnaires	4	10
Public barazas (meetings); Stakeholder forums; & Surveys and questionnaires	2	5
Stakeholder forums	1	2.5

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The study established that public barazas (meetings) were the most common form of participatory method used in budgeting engagements, as supported by 52.5% of the respondents. Public barazas were common, as used alongside other means. For instance, there were 22.5% of the respondents who noted that a combination of three approaches was used, including public barazas, stakeholder forums, and social media platforms. There were 2.5% of the respondents who noted that only stakeholder forums were used for participatory communication in the budgeting process. The rating of the effectiveness of the participatory communication methods as used by MCAs was shown on Figure 1.

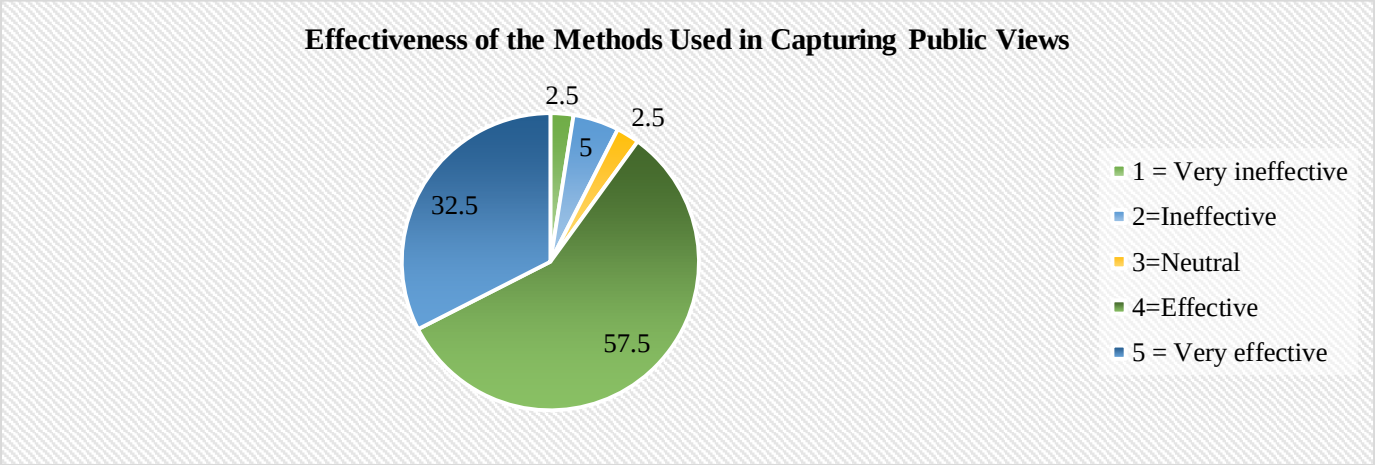

Figure 1

Rating of Participatory Communication Methods for Public Participation

It was established that a majority of respondents at 57.5% of them said it was effective, and another 32.5% mentioned it was very effective. In total, there were 90.0% of the respondents who felt the participatory communication methods were either effective or very effective. There were 5% of the respondents who felt that the participatory approaches were not ineffective, and another 2.5% felt they were very ineffective. The study therefore observes that the respondents agreed that the participatory methods were effective.

Further, the researcher sought to establish how the County Assembly has adapted its communication strategies to enhance public engagement in budgeting. Several responses were given, where use of radio communication (10.0%) was mentioned as the most commonly used approach for ensuring public participation. Another common approach mentioned by 7.5% was the use of oversight by MCAs through their local offices to ensure that the persons notified were engaged and gave their feedback. Further, about 5% of the respondents noted that the county staffs attended barazas as well conducting their own independent validations on whether there were public participations. Further, the county made the public aware of the public participation meetings in advance, as mentioned by 5% of the respondents. Some of the quotes were as mentioned in response to the methods used for participatory communication;

> "*By attending barazas and conducting its own independent validation forum*." MCA 1, Male
>
> "*By establishing a communication unit at the county assembly"* MCA 2, Male
>
> "*By use of oversight, they use their local offices to ensure all persons are notified, share proposals to community for more participation and engagement.*" MCA 3, Male
>
> "*By use of public barazas (community meetings), and social media and print media to validate participation and create awareness among the public*" MCA 5, Female.

From the secondary data, Muthomi (2024) for USA, Chapman (2021) in Russia, and Al Hudithi (2017) in Saudi Arabia noted that social media and government websites, social media forums, and social media platforms respectively were used for enabling public participation. The findings in this study concur with Smith (2015) in Georgia, USA, who observed that usage of electronic media was uneven across the states but was gaining popularity. In a similar finding, Ogoti et al. (2024) noted that social media and print media were strongly associated with effective public participation in the case of Nyeri County in Kenya. Further, the researcher sought to identify the components of participatory communication methods as used by the MCAs in budget-making processes in Makueni County. The responses were shown on Table 4.

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Table 4

Participatory Communication Methods

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
The use of public forums effectively gathers citizen input during the budget-making process.	10.0	5.0	45.0	40.0	0.0	3.15	0.921
Digital platforms are underutilized in facilitating public participation in budget discussions	7.5	12.5	5.0	70.0	5.0	3.53	1.037
Traditional media channels (radio, newspapers) are the primary sources of budget information for constituents	12.5	17.5	5.0	65.0	0.0	3.23	1.143
Feedback mechanisms for public input on budget matters are well-established and accessible.	10.0	10.0	15.0	65.0	0.0	3.35	1.027
Language barriers hinder effective participatory communication in budget consultations	22.5	40.0	2.5	35.0	0.0	2.5	1.198
The County Assembly regularly updates the public on budget proceedings through multiple communication channels.	2.5	12.5	5.0	80.0	0.0	3.63	0.807

There were 15.0% (10.0% strongly disagree and 5.0% disagree) that the use of public forums effectively gained citizen inputs on budget-making processes in Makueni County. There were 45.0% of the MCAs who were neutral on whether the public forums provided appropriate inputs on budget-making process. This showed that a significant number of MCAS felt that the public forums were not reaching out the citizens as required. Further, there were 40.0% of the respondents who agreed that the public forums were effective in gathering citizen inputs on budget-making process. The implication is that the public forums used for public participation do not elicit citizen inputs on budget-making processes, necessitating a need for change or review of the public forums used.

There were 20.0% (7.5% strongly disagree and 12.5% disagree) of the respondents disagreeing that the county government was underutilizing the digital platforms in facilitating public participation in budget discussions. On the other hand, a significant majority of respondents at 75.0% (70.0% agree and 5% strongly agree) agreed that digital platforms were underutilized in facilitating public participation in budget discussions. The findings show that the digital platforms, especially the social media, are not commonly used to communicate on the budgeting processes.

There were 30.0% (12.5% strongly disagree and 17.5% disagreeing) of the respondents disagreeing that the traditional media channels (radio, newspapers) are the primary sources of budget information for constituents, while another 5.0% were neutral. On the contrary, a significant majority at 65.0% agreed that the traditional media channels formed the primary source of information for the constituents. This was also supported by the mean of 3.23, showing the general perception was that the respondents agreed that the traditional media was the most commonly used channel for eliciting inputs from citizens.

The study established that a significant majority of respondents, at 65.0%, agreed that there are well-established and accessible feedback mechanisms for public input on budget matters in the county. This was also supported by the mean of 3.35, showing most of the respondents agreed that there were well-established and accessible feedback mechanisms. On the contrary, there were 15.0% who were neutral and another 20.0% (10.0% strongly disagreeing and 10.0% disagreeing) that there were no established and accessible feedback mechanisms for public inputs on budgeting. The implication is that there is need to strengthen the feedback mechanisms for the citizens who give input on budgeting processes to get their feedback on the actions taken.

A significant majority at 62.5% (22.5% strongly disagree and 40.0% disagree) disagreed that language barriers hinder effective participatory communication in budget consultations. There were another 2.5% who were neutral, and 35.0% agreed that language was a significant language barrier to effective participatory communication in budget consultations. The mean of 2.5 shows that most of the respondents disagreed that language barrier was not a hindrance to participatory communication.

There were an overwhelming majority of respondents, at 80.0%, who felt that the County Assembly regularly updates the public on budget proceedings through multiple communication channels. The remaining 20.0% (5% neutral, 12.5% disagree and 2.5% strongly disagree) felt that there were no regular updates to the public on the budget proceedings though multiple communication channels. The mean of 3.67 shows that most of the respondents agreed that there were regular updates to the public on budget making processes.

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From the qualitative data, there were opinions to engage more frequently the persons with disability and that there is need make the budgeting process as simple as possible through simplifying the big budget documents. This was supported by some of the quotes below.

"PWDs to be involved in budget making process." MCA 6, Male, PWD

"The document is so wide for public to understand. There is need to simplify the budget and make it abstract." MCA 7, Male

"The public needs more time to interact with the budget for better feedback." MCA 8, Male

The findings on the need to engage a wider scope of stakeholders was also echoed from other studies. For instance, Njiru (2020) noted that some key populations like persons with disabilities were left out, while also noting that participatory communication had increased participation from traditionally marginalized groups like youths and women.

4.3 Stakeholder Engagement on Participatory Communication for Budget-Making Process

The levels of stakeholder engagement were measured by the key stakeholders engaged, frequency of engaging them (stakeholders), platforms used, and the factors that determine the levels of participation among different stakeholders. The summary of the key stakeholders is shown on Table 5.

Table 5

Key Stakeholders

Key stakeholders	Frequency	Percentage
Community members	22	55
Civil society organizations	1	2.5
Community members; Civil society organizations; Government departments	1	2.5
Community members; Civil society organizations; Government departments; Private sector representatives	11	27.5
Community members; Civil society organizations; Private sector representatives	2	5
Community members; Government departments	3	7.5
Total	40	100

Community members formed the largest shareholders of public participation as mentioned by 55.0% of the respondents. Civil society organizations formed 2.5% of the key stakeholders, similar to the government departments. The combination of private sector representatives, government departments, and civil society organizations formed about 27.5% of the respondents.

The platforms used for engaging stakeholders in budget-making processes were face-to-face meetings (mentioned by 80.0% of the respondents), digital communication platforms like social media, SMS (short-message service), and emails as mentioned by 17.5%, and the least were official documents reports as mentioned by 2.5% of the respondents. From the findings, it was established that face-to-face meetings were most common, and most preferred by the respondents. The summary of the information is shown on Figure 2.

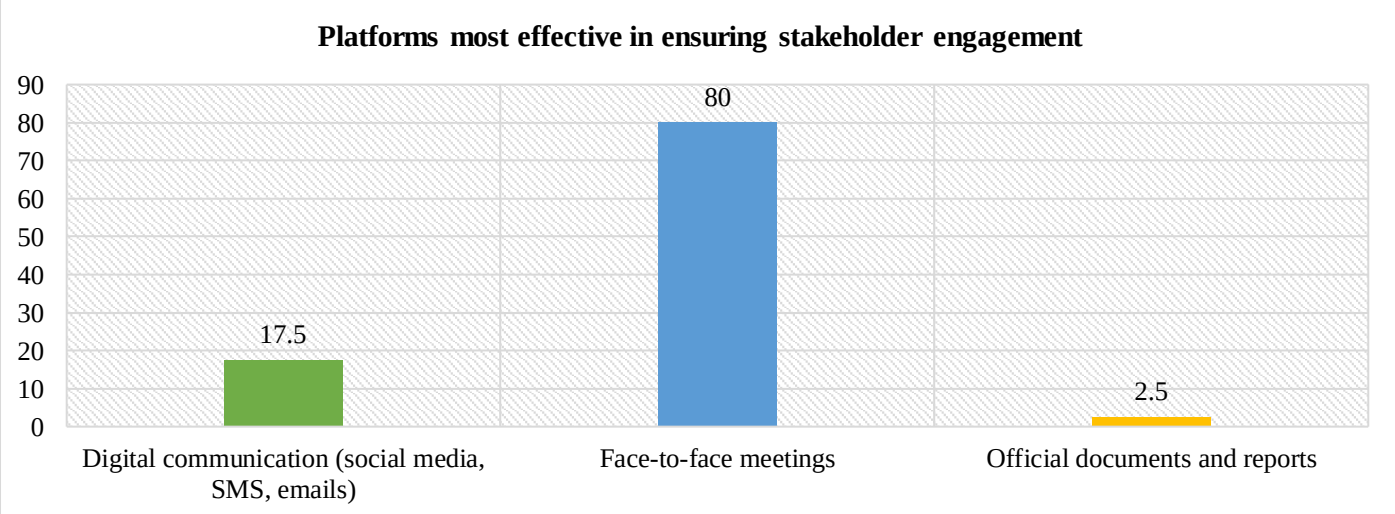

Figure 2

Platforms Most Effective for Stakeholder Engagement

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From the other peer-reviewed studies, radio stations were used for the case of Nyeri, as opposed to this study's findings, where radio was not mentioned as much as a strong channel for participatory communication. On another note, the study established similar observations as noted by Keshine (2018) who argued that social media, radio stations and the public gatherings were common forms of public participation in Laikipia County. Similar findings were also recorded by Agalo et al (2018) in Kisii County, who, in contrast to the findings in this study, concluded that social media platforms were WhatsApp and Facebook to communicate participatory communication and participation on budgeting. There were multiple questions asked to measure the perception of the respondents on the most effective platforms for stakeholder engagement, where the results are shown on Table 6.

Table 6

Responses on Stakeholder Engagement

Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	Mean	Std. Dev.
MCAs actively encourage community members to attend budget planning meetings.	0.0	0.0	0.0	52.5	47.5	4.5	0.506
There is sufficient collaboration between MCAs and civil society organizations in the budget-making process.	2.5	20.0	15.0	55.0	7.5	3.5	0.986
Youth and marginalized groups are adequately represented in budget discussions.	0.0	5.0	22.5	47.5	25.0	3.9	0.829
Stakeholder feedback is genuinely considered and incorporated into the final budget decisions.	0.0	0.0	15.0	62.5	22.5	4.1	0.616
The timing of public consultations is convenient for the majority of stakeholders.	0.0	10.0	10.0	70.0	10.0	3.8	0.758
MCAs provide clear and understandable budget information to all stakeholders.	0.0	10.0	2.5	62.5	25.0	4.0	0.832

From the findings, it was established that 52.5% agreed, and 47.5% of the respondents agreed and strongly agreed that MCAs actively encourage community members to attend budget planning meetings. The mean of 4.5 shows that the respondents strongly agreed that MCAs encouraged community members to attend budget planning meeting. There is sufficient collaboration between MCAs and civil society organizations in the budget-making process, as supported by 62.5% of the respondents and a mean of 3.5. Similarly, there were another 22.5% of the respondents who disagreed that there was no strong collaboration between MCAs and civil society organizations in budget-making processes.

A significant majority of respondents at 72.5% (47.5% agreed and 25.0% strongly agree) agreed that youth and marginalized groups are adequately represented in budget discussions. This was also showed by the mean of 3.9, indicating respondents agreed with the statement. There were a relatively higher proportion of respondents at 22.5% who were neutral, neither agreeing nor disagreeing that the youth and marginalized groups are adequately represented in budget-making processes.

The majority of respondents at 85.0% (62.5% agree and 22.5% strongly agree) agreed that stakeholder feedback is genuinely considered and incorporated into the final budget decisions. The mean of 4.1 also showed that respondents strongly agreed that stakeholder feedback was genuinely considered and put into the final budget decisions. There were 15.0% of the respondents who did not either agree or disagree. There were an overwhelming majority of the respondents at 80.0% (70.0% agree and 10.0% strongly agree) who agreed that timing of public consultations is convenient for the majority of stakeholders. This was also supported by a mean of 3.8, showing respondents agreed with the statement. There were however a 10.0% of the respondents who disagreed with the statement.

An overwhelming response from 87.5% (62.5% agree and 25.0% strongly agree) of the respondents noted that MCAs provide clear and understandable budget information to all stakeholders. There were another 10.0% who, on the contrary, disagreed that the MCAs provided clear and understandable budget information to all stakeholders.

The findings in this study align with other empirical studies that underscore the importance of active legislative engagement and inclusivity in participatory budgeting. For instance, Gachoka (2021) similarly found that participatory communication in Makueni County enhanced citizen inclusion in budget processes, allowing community voices to be reflected in final allocations—echoing this study's finding that 85% of respondents agreed stakeholder feedback was genuinely incorporated into budget decisions. Likewise, Njiru (2020) established that in counties integrating participatory communication, there was increased representation of youth and marginalized groups,

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consistent with the 72.5% of respondents in this study who agreed that such groups were adequately represented in budget discussions. Additionally, Shomary and Mbuti (2022) found that efficient communication and collaboration between local government actors and civil society organizations improved budgeting effectiveness, which supports the present study's finding that 62.5% of respondents recognized sufficient collaboration between MCAs and CSOs in budget-making. These convergent findings highlight that transparent communication, inclusivity, and collaboration among key actors are central to strengthening participatory governance and ensuring equitable budgeting outcomes.

4.4 Regression Analysis

The study variables were subjected to bivariate correlation using Pearson Chi-square correlation to establish whether the independent variables were correlated to the dependent variable, effectiveness in budgetary making processes. The results are shown on Table 7;

Table 7

Pearson Chi-Square Correlation for Participatory Communication and Budgeting

		Participatory communication methods	**Stakeholder engagement**	**Effects of participatory Communication on budget**
Participatory communication methods	Pearson Correlation	1	0.085	-.431**
	Sig. (2-tailed)		0.602	0.005
Stakeholder engagement	Pearson Correlation	0.085	1	.359*
	Sig. (2-tailed)	0.602		0.023
Effects of participatory communication on budget	Pearson Correlation	-.431**	.359*	1
	Sig. (2-tailed)	0.005	0.023	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

From the bivariate analysis, the effects of participatory communication on budget-making process were significantly correlated to participatory communication methods (r=-0.431, p<0.005), and stakeholder engagement (r= 0.359, p<0.023). The implication is that participatory communication on budgeting making process is significantly influenced by the methods used, which had a weak negative correlation (-0.431) with the budgeting process. On the other hand, stakeholder engagement was shown to have a positive correlation with budgeting process outcomes (0.359).

Furthermore, multilinear regression analysis was carried out. The findings d were the results are presented on table 8.

Table 8

Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.647a	0.419	0.37	0.368

a Predictors: (Constant), Part comm methods, stakeholder engagement

The model summary shows that the three variables of participatory communication methods; challenges and barriers; and stakeholder engagement contributed to 41.9% change in effectiveness of budgeting process at the county government. This shows that the participatory communication had a significant contribution towards efficiency in budgeting process as supported by quality budgeting processes, and informed decisions at the citizen level.

The ANOVA summary is presented on Table 9.

Table 9

ANOVA [a] Summary

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	3.517	3	1.172	8.644	.000b
	Residual	4.883	36	0.136		
	Total	8.4	39			

a Dependent Variable: Effects of participatory comm on budget

b Predictors: (Constant), Part comm methods, stakeholder engagement

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From the ANOVA (analysis of variance) table, the model was significant as shown by p-value <0.001. The predictors participatory communication methods, challenges and barriers, and stakeholder engagement were significantly correlated (p=0.000). The regression coefficients are presented on Table 10.

Table 10

Regression Coefficients [a]

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.889	0.556		8.8	0
Stakeholder engagement	0.219	0.091	0.319	2.404	0.022
Part comm methods	-0.257	0.07	-0.468	-3.67	0.001

a Dependent Variable: Effects of participatory communication on budget-making process

From the regression analysis, effective budget-making process at the county was significantly influenced by the stakeholder engagement (p<0.022). Further, a unit increase in stakeholder engagement (more and effective stakeholders' participation) was associated with 0.219 times increase in effectiveness in budget-making process. This shows that there is need to engage in an elaborate, inclusive, and county-wide stakeholder engagement during budgeting. Lastly, a unit increase in participatory methods was associated with a 0.257 decrease in effectiveness in budget-making process. This shows that there is a need to review the participatory communication methods used, and embrace that reach more citizens for budget participation and planning.

The regression analysis further reinforces the critical role of stakeholder engagement in enhancing the effectiveness of the budget-making process. The positive and significant relationship (p<0.022) indicates that inclusive and meaningful participation directly contributes to more effective budgeting outcomes. These findings align with Shomary and Mbuti (2022), who observed that active collaboration between citizens and government institutions leads to more efficient and transparent budgeting. Similarly, Gachoka (2021) emphasized that engaging diverse stakeholders builds trust and improves the legitimacy of budget decisions. However, the observed negative coefficient (-0.257) for participatory methods suggests that current communication approaches may be limited in reach or effectiveness, echoing Njiru's (2020) call for more adaptive and context-specific participatory models that ensure wider public engagement in county budget processes.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concluded that face-to-face meetings remain the dominant participatory communication method in Makueni County's budget-making process, with 80% of respondents favoring them for their effectiveness in fostering direct dialogue. While digital platforms such as social media and SMS are slowly emerging, their limited uptake highlights infrastructural constraints and a population preference for physical interaction. These participatory approaches have allowed communities particularly grassroots members who constituted 55% of participants—to voice priorities, provide feedback, and stay informed on budgetary decisions. Moreover, participatory communication has enhanced inclusivity and transparency, with respondents affirming adequate representation of youth and marginalized groups, timely consultations, and clear communication of budget information by MCAs.

However, the findings also revealed critical gaps. Regression analysis suggested that increased reliance on current participatory methods may actually reduce the overall effectiveness of budget-making, pointing to the need for diversification and modernization of strategies to reach broader demographics, especially those excluded from in-person forums. While community members were most engaged, civil society organizations, private sector actors, and government departments had minimal involvement, reflecting disparities in stakeholder inclusion. Although engagement frequency was generally high, the study underscores the importance of broadening participation channels and adopting more balanced approaches that strengthen inclusivity beyond community members to ensure a more representative and effective budgeting process.

5.2 Recommendations

The following are the recommendations for the county assembly and the county executive to improve efficiency in budget-making processes. To enhance inclusivity in the budgeting process, the county assembly should broaden stakeholder representation by actively involving civil society organizations, private sector actors, and relevant government departments alongside community members. A more diverse mix of participants will help balance interests, enrich deliberations, and strengthen the legitimacy and acceptance of budget decisions among citizens.

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Furthermore, the county assembly and the executive should strengthen digital communication platforms to make public participation more accessible. Investing in digital infrastructure and equipping county officials with skills to use social media, mobile platforms, and email will enable wider outreach, particularly to youth and citizens who cannot attend physical forums. This strategy will help address the current underutilization of digital tools, reported at only 17.5%, and mitigate technological barriers that were identified by 80% of respondents.

Lastly, there is a need to improve the communication and facilitation capacity of Members of County Assembly (MCAs). The county assembly and executive should institute refresher training programs focused on participatory communication and budget engagement practices. Through addressing the identified 15% training gap among MCAs, these programs will strengthen their ability to conduct inclusive, clear, and effective consultations with diverse stakeholders, ultimately improving public trust and the quality of budget deliberations.

Declaration of conflict of interest

The authors declare no conflict of interest at all.

REFERENCES

Agalo, J., Kinya, H., & Nyamari, A. N. (2018). Effects of social media use in participatory budgeting in county governance: A case study of Kisii county, Kenya. *International Journal of Social Sciences and Information Technology, 4*(11), 106–126. https://www.ijssit.com/main/wp-content/uploads/2018/12/Effects-Of-Social-Media-Use-In-Participatory-Budgeting-In-County-Governance.pdf

Al Hudithi, F. A. S. (2017). Social capital and participative budgeting: A process thinking perspective (Doctoral dissertation, University of Hull). https://hull-repository.worktribe.com/output/4219634

Arendt, H., Benhabib, S., Bohman, J., Dewey, J., Elster, J., Fraser, N., & Schumpeter, J. (2010). *The idea of the public sphere: A reader*. Lexington Books.

Baiocchi, G., & Ganuza, E. (2014). Participatory budgeting as if emancipation mattered. *Politics & Society, 42*(1), 29–50.

Berger, J., & Webster, M., Jr. (2018). Expectations, status, and behavior theories. In *Contemporary social psychological theories* (pp. 281–314).

Chapman, H. S. (2021). Shoring up autocracy: Participatory technologies and regime support in Putin's Russia. *Comparative Political Studies, 54*(8), 1459–1489.

Gachoka, L. (2021). Public participation in the budgeting process: A case study of Makueni County, Kenya. *Kenyan Journal of Public Administration, 10*(3), 120–135.

Gilman, H. R. (2016). *Democracy reinvented: Participatory budgeting and civic innovation in America*. Brookings Institution Press.

Habermas, J. (1962). *The structural transformation of the public sphere*. MIT Press.

Hao, C., Nyaranga, M. S., & Hongo, D. O. (2022). Enhancing public participation in governance for sustainable development: Evidence from Bungoma County, Kenya. *SAGE Open, 12*(1), 21582440221088855.

Johannessen, L. E., & Collins, R. (2024). The future of interaction rituals: An interview with Randall Collins. *Theory and Society, 53*(6), 1491–1504.

Juma, G. O., Otieno, M., & Oluoch, J. (2023). Use of WhatsApp messaging in enhancing public participation in the budgeting process: A study of Migori County Government. *International Journal of Professional Practice (IJPP), 2*(1), 1–19.

Keshine, A. (2018). The role of public participation in enhancing budget making process: The case of Laikipia County [Master's thesis, University of Nairobi].

Lorsuwannarat, T. (2017). Public participation in budgeting: The new path of budget reform in Thailand. *International Journal of Public Administration, 40*(5), 385–400.

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative & qualitative approaches* (Vol. 2, No. 2). Acts Press.

Muthomi, F. (2024). Perceived values of public participation practices in budgeting: Insights from incorporated local governments in Oregon. *State and Local Government Review, 56*(2), 196–206.

Njiru, E. (2020). Citizen engagement in county budgeting: The case of Makueni County, Kenya. *Public Administration Review, 24*(4), 50–67.

Ogoti, L., Mberia, H., & Ndavula, J. (2024). Media choice and public participation in the budget making process for Nyeri County. *International Journal of Communication and Public Relation, 9*(2), 20–43.

Shomary, M., & Mbuti, E. (2022). Effectiveness of citizen participation in the budget making process in Tanzania local government authorities. http://repository.iaa.ac.tz:8080/xmlui/handle/123456789/1932

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Sintomer, Y., Herzberg, C., Röcke, A., & Allegretti, G. (2012). Transnational models of citizen participation: The case of participatory budgeting. *Journal of Public Deliberation, 8*(2), 1–9.

Smith, R. (2015, June). Electronic citizen participation in local government decision making; Applications for public budgeting. In *European Conference on Digital Government* (p. 274). Academic Conferences International Limited.

Szklarska, A. (2020). The problems with liberal consensus: Agonistic politics according to Chantal Mouffe. *Argument: Biannual Philosophical Journal, 10*(1), 95–114.

Wampler, B., McNulty, S., McNulty, S. L., & Touchton, M. (2021). *Participatory budgeting in global perspective*. Oxford University Press.

Yadamsuren, B. (2006). Citizens' participation in local budgeting: The case of Mongolia. *Network of Asia-Pacific Schools and Institutes of Public Administration and Governance (NAPSIPAG)*, 90–91.

Young, I. M. (2001). Activist challenges to deliberative democracy. *Political Theory, 29*(5), 670–690.

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The influence of information and communication technology on Quaker worship at Kakamega Yearly Meeting

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ABSTRACT

Quaker worship is deeply rooted in simplicity, silence, and direct communion with the Divine. However, the rapid advancement of Information and Communication Technology (ICT) has permeated religious practices, including those of the Kakamega Yearly Meeting (KYM). This study investigates the impact of ICT integration on Quaker worship, exploring both its benefits and challenges. This mixed-method research used the Sociotechnical Theory and involved a combination of qualitative interviews and focus group discussions in addition to quantitative surveys of 380 respondents representing 12 of KYM's ICT-compliant churches. The target population was 1184 registered church members. Key informants were sampled out using the stratified random sampling technique. These included church leadership, departmental heads of the United Society of Friends Women, Quakers, and Youth Friends. Data was analyzed thematically and descriptively by the use of SPSS. Findings reveal that ICT tools such as projectors, musical instruments, and online platforms enhanced accessibility, inclusivity, and engagement in worship. However, challenges include the potential dilution of Quaker values like simplicity and silence as well as disparities in access to technology. The study concludes with recommendations for balancing technological adoption with core Quaker principles, emphasizing educational initiatives, discernment, and community inclusivity. Further research is suggested to explore ethical considerations and the reasons for breakaway movements within Quaker communities.

Key words: ICT, Kakamega Yearly Meeting, Technology in Religion, Digital Divide, Quaker Worship

I. INTRODUCTION

Quakerism, which is formally referred to as the Religious Society of Friends, is a branch of Christianity that originated in 1650s in England and arrived in Kenya in 1902 in Kaimosi by Arthur Chilson, Edgar Hole, and Willis Hotchkiss (Kenworthy, 1952; Matasio, 2017). Kenya Kakamega Yearly Meeting (KYM) is one of the largest Quaker institutions in Kenya; which through its worship practices focuses on aspects of simplicity as practiced during worship, silence, equality, and community discernment, which has come to shape a distinctive spiritual identity within the region.

Information and Communication Technology (ICT) has transformed religious activities through extending the access of remote worship, effective communication, and involvement in the faith groups globally (McDonnell, 2014). In Africa, churches are using ICT to conduct virtual services, online bible study groups, and cross-country faith networks as internet penetration and smartphones continue to increase in the continent (Newton, 2024; Yamuremye et al., 2022). In Kenya, and even among the Quakers, ICT (live streaming, WhatsApp groups, the use of projectors and digital hymn books) has led to greater accessibility, engagement and theological education and transformed the way worship is conducted (Magezi, 2015; Freeman, 2017).

Although these outcomes are positive, there has been concern about the disruptive power of ICT in non-liturgical, contemplative traditions such as Quakerism where silence and simplicity of worship is key (Magezi, 2015). There is concern that technology may have some distractions, blur the inward center of the spiritual quest, and establish a digital divide that involves some congregants who may be excluded due to marginal access to the internet or the use of devices. Although the use of ICT in Pentecostal and mainstream worship was investigated in previous studies (Kathambi et al., 2021), not much scholarship focuses on how ICT interacts with simplicity-driven worship cultures and silent cultures and communal discernment of Quakers.

The current research has examined the application of ICT in religious practices, and its values in promoting communication, participation, and accessibility to worship materials by the Christian religions ((McDonnell, 2014). African notwithstanding, ICT has been identified as an important tool of worship facilitation, congregant connection across geographical divides through its value of interaction in the area of faith space in the community. Nevertheless,

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in spite of these admitted advantages, there are still some crucial knowledge vacuums, especially those surrounding the ways in which ICT can melt with research-based worship lines, based on contemplation and respect of silence, e.g. Quakerism. The effect of the technology on the felt quality of silent worship, discernment, and the theological aspects of simplicity and spiritual inner focus which is the crux of the Quaker practices have little analysis about their role in technology. Furthermore, the possible ethical concerns with the use of ICT in Quaker worship have not received enough coverage, including the issues of distraction, digital inequality, and possible conflict of interests with other Quaker testimonies of simplicity and integrity (Yamuremye et al., 2022).

Moreover, whereas the role of ICT in strengthening participation and building community ties has been explored, the effects of technology on congregational processes, spiritual growth and community development among Quakers especially in Kakamega Yearly Meeting (KYM) have not been discussed. This is why the local context of KYM, including its own socio-cultural context and the pattern of technology adoption, has been underrepresented, and this is why targeted research is required to comprehend the impact of ICT on the Quaker worship practices in this particular Kenyan context. To have a comprehensive examination about how Quaker worship is changing in the digital era, these gaps need filling in order to have a clear picture. The study thus aims at determining the impact of Information and Communication Technology on the Quaker worship at the Kakamega Yearly Meeting and to present context-sensitive understanding that will affect future ways through which the community of Quakers can embrace the change of technology and maintain the spiritual identity of silence, simplicity, and community.

1.1 Statement of the Problem

The adoption of Information and Communication Technology (ICT) within the Quaker worship services of the Kakamega Yearly Meeting (KYM) creates a significant tension. On one hand, digital instruments such as live-streamed meetings, electronic songbooks, and online platforms can broaden participation and foster connection. On the other hand, their use threatens to undermine the tradition's foundational principles, which include simplicity, silent worship, and egalitarianism. Specific anxieties involve the potential for technological devices to fracture concentration during worship, the unequal availability of digital resources that may further marginalize some congregants, and the possibility that emphasis on novel tools could eclipse the central focus on spiritual reflection.

Although prior research has explored the general use of technology in religious settings (Mavhunga, 2019; McDonnell, 2014), there is a scarcity of focused analysis on its effects within traditions that prioritize unprogrammed, silent worship like Quakerism. The existing literature predominantly investigates technological implementation in the Pentacostal (Omatoyo,) and mainstream liturgical churches (Kathambi et al., 2021), leaving a gap in understanding how digital media intersect with non-liturgical, contemplative practices. Furthermore, while issues of digital access have been acknowledged (Freeman, 2017), the deeper spiritual implications of ICT-mediated worship, specifically its impact on communal decision-making and personal introspection, are not sufficiently studied. Addressing these omissions, this study investigates the strategies employed by the Kakamega Yearly Meeting to incorporate ICT while safeguarding its distinctive silent worship practice. The study aims to provide new perspectives on the interplay between technology and faiths that emphasize simplicity, ultimately proposing a framework for thoughtful technology adoption that respects both tradition and innovation (Yauremye et al., 2022).

1.2 Research Objective

The primary objective of this study is to investigate the influence of ICT on Quaker worship at KYM, focusing on its benefits, challenges and implications for community cohesion.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is anchored in the Sociotechnical Theory and the Religious-Social Presence Theory, which collectively provide a comprehensive lens for examining how ICT integration interacts with Quaker worship practices at Kakamega Yearly Meeting (KYM).

2.1.1 Sociotechnical Theory

According to Sociotechnical Theory, originally introduced by Trist and Bamforth (1951), and later elaborated by Williams and Edge in 1996, adoption and use of technologies is not deterministic as there are stipulated societal conditions or orientations that influence the interpretation of technology by individuals and groups in specific communities and culture. This theory disputes technological determinism by insisting on the interdynamics of a technological system (technology) and human values, applications and arrangements (social system). The framework has been utilized in any study that considers technology in organizations and in religious settings. An example of this is the work by Orlikowski (1992) that employed the Sociotechnical Theory in explaining how technology

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implementation and adaptation in organizations are determined by the user practices, and the research by Campbell (2017) that employed the Sociotechnical Theory in analyzing the technology use negotiated by faith communities as a way of adjusting to their beliefs and practices. When applied within the context of the current study, Sociotechnical Theory may be applicable in examining the relationship between the values of simplicity, silence, inward light, and equality of Quakers at KYM and ICT adaptation and usage in the context of worship practices, as opposed to KYM becoming a passive recipient of the changes brought about by technology. It allows us to explore the ways in which technology is placed within the spiritual and communal patterns called Quakerism.

2.1.2 Religious-Social Presence Theory

Campbell (2017) formulated Religious-Social Presence Theory to study the effects of using mediated communication technologies on religious spiritual experiences in communities. The theory is an evolution of the broader Social Presence Theory (Short et al., 1976), which involves the comparison of the communication media in terms of their abilities to transmit the other presence during the interactions. Campbell (2017) transferred such a framework to the religious environment claiming that technology could define the apparent presence of community, divine and spiritual connection in the environment of worship. Existing literature has used Religious-Social Presence Theory to evaluate the ability of tools like live streaming, online prayer groups, and digital worship activities to strengthen or weaken the feeling of divine presence when people engage in mediated practices (Kinya, 2023; Campbell & Vitullo, 2016). Regarding KYM, this theory plays a significant role in determining how the utilization of ICT; e.g., online worship, live streaming, and digital hymnals, improves or interferes with collective spiritual focus, silent worship, and the sense of divine presence upon which Quakerism is based.

2.1.3 Relevance to the Current Study

Sociotechnical Theory and Religious-Social Presence Theory provide a scope through which to carry out an in-depth study of how the use of ICT tools interact with Quaker doctrine which entails analyzing how the adoption of technology is filtered to accommodate the values of the Quaker subculture but still transform spiritual experiences in the community. The theories offer a bifocal perspective by which we may look not just at the practicalities of incorporating ICT into the worship experience but also at the spiritual and community-related aspects of the matter.

2.2 Empirical Review

Recent researches have demonstrated the various effects of Information and Communication Technology (ICT) in the religious arena especially on shaping worship activities and community involvement. According to a study by Omotayo (2017), which examined the use of ICT in the Pentecostal churches in Nigeria, it has been determined that ICT has a remarkable effect on youth involvement in church tasks. Nevertheless, the introduction of digital brought age differences in worship styles since younger members adjusted to digital-based tools to worship whilst the older generations were more partial to the traditional face-to-face style of interaction. The same can be noticed over at Kakamega Yearly Meeting (KYM) where more stressful emphasis is given to keeping contemplative and to maintaining the traditional aspects of worship, in spite of the increased reliance upon ICT as a means of virtual attendance.

Research conducted by Kathambi et al. (2021) on the Kenyan mainline churches showed that 68 percent of congregations reported improvement in their reach-out capabilities due to the utilization of digital tools, i.e. social media and online platforms. But this digital growth had a negative aspect as 42 percent of those surveyed indicated a decline in interpersonal relationships and the personal face-to-face communication that typifies much of the communal side of worship. Such trends are are reflected in the case of KYM where online presence in the worship sessions has enabled greater access to the gathering but with members complaining of becoming disengaged with the community, emphasising the conflict between technology enabling interconnection and maintaining community relationships.

A study conducted by Magezi (2015) in Zimbabwe concentrated on the cost barriers that restricted the adoption of ICT in rural churches because churches in underserved regions were faced with a lack of funding as well as the availability of required ICT infrastructure. It especially applies to KYM, because a significant number of its members reside in semi-rural places where access to ICT tools and the internet is not constant. The results of the research conducted by Magezi are also relevant to the problems experienced by KYM because the fair access to the digital tools of worship is a problem: some members might not be able to actively participate in online services and get access to online resources due to the lack of them.

2.2.1 Historical Context of ICT in Worship

The use of audio technology, such as microphones and sound systems, has greatly enhanced the quality and reach of Christian worship services. The introduction of public address systems in the early 20th century enabled

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amplified sound, allowing larger congregations to hear sermons and music clearly (Briggs, 2013). This development transformed the worship experience by ensuring audibility and inclusivity.

Before the advent of projectors, computers, internet and the likes, the most popular devices used in worship were the audio systems, microphones, soundboard, processor and improved monitor systems, though these gadgets are provincial and not sophisticated. Nevertheless, they do serve the purpose they are meant to serve. They pose less challenge and they distract worshippers during worship. Communication technology now plays an important role in the Sunday worship. Most men of God now have their Scriptures and other religious materials on the phone or tablet. Some often use computers to research and prepare lessons that will be taught on Sundays. Meanwhile some church leaders have been encouraging members to use digital versions of religious materials rather than costly and environmentally impactful paper books and magazines. Most weekends, church members now watch the proceedings in their homes through streaming video on the television (Ajani & Adeyemi, 2019). Therefore this research is similar to the current study that investigates the influence of ICT especially musical instruments such as microphones and keyboards have influenced Quaker Worship at Kakamega Yearly Meeting.

The traditional way of worship has been focused on auditory processing, reaching the part of the congregation that is able to retain information and the word of God by hearing it; however, a large portion of the population is now used to accessing information through visual processing (Ezeabata, 2024). Integrating video and visual stimulation to support the Word of God during worship services allows a greater number of congregation members to fully understand the message. Since the last two decades, a lot of dynamic changes have taken place in the areas of religion, culture, economy and politics. ICT is being envisaged as possessing the potential to transform the society and impact positively on the lives of people in general (Ajani & Adeyemi, 2019). This study will help the researcher of the current study understand the history of communication in worship with a focus on Quaker Worship at Kakamega Yearly Meeting.

However, ICT tools and platforms are very expensive to purchase and maintain. This has discouraged many churches into embracing ICT for use in their churches. In addition, full time workers in a church may be made redundant because the church may not afford to pay them after buying a high end presentation system. The church must endeavor to clearly understand the role of ICT in order to make good use of it and even those using it should strive to understand its role and priority. In view of the above, the church should avoid making the technology a higher priority than its leadership. There has also been inadequate ICT infrastructure, limited ICT skills and training, limited access to technical support, lack of ICT policies in church and budget constraints hinder the integration of ICT in church activities. Lack of internet connectivity contributes to the slow use of ICT. In addition, lack of regular access to the computers in churches makes it harder to prepare ICT based sermons. Further, there is irregular power supply in the churches and high-cost hardware and software (Kathambi et al., 2021). This makes it challenging for the church leaders to acquire appropriate ICT facilities in churches (Kathambi et al., 2021).This adds knowledge to research on the possible reasons why some churches might not be embracing ICT with focus on the Quaker of KYM during mapping and sampling of churches.

Several studies have focused on the impact of ICT on the worship experience in terms of audiovisual enhancements, virtual participation, and access to digital resources. However, there is a knowledge gap in understanding the subjective experience and perception of worshippers regarding the incorporation of ICT in worship. Future research could explore the effects of ICT on the emotional, spiritual, and transformative aspects of worship for individuals and congregations (Campbell & DeLashmutt, 2014; Smith, 2019). Hence the significance of the current study on how ICT has influenced the spiritual, emotional aspects of Quaker worship at KYM for both individuals such as pastors and leaders; and congregations such as youth, adults and the old.

III. METHODOLOGY

3.1 Research Design

The researcher adopted a descriptive research design, which aims to systematically describe phenomena as they exist in the present. Creswell (1994) defines this method as gathering information about existing conditions, and further elaborates (2012, p. 274) that it seeks to provide a detailed explanation and description of the research subject. In this study, the descriptive design is relevant because it allows the researcher to explore the role of ICT in Quaker worship at Kakamega Yearly Meeting (KYM).

3.2 Study Area

The study was conducted in Kakamega County which comprises Lurambi Sub County, Mumias West Sub County, Shinyalu Sub County and Ikolomani Sub County. The choice of the study areas was informed by the zoning of Quakers into Yearly Meetings where the Kakamega Yearly Meeting enjoys the use of Information and Communication Technology as an area that is Pre-urban due to proximity to Kakamega or Mumias Town. The above

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sub-counties were chosen on the basis they have adopted ICT (Kakamega County Integrated development plan report of 2018-2022) .The selection of this study was guided by the availability of electricity and internet accessibility (Office of the Auditor General on the financial statements of Kenya Power and Lightning Company Limited-Rural electrification scheme June 2015). Further, Kakamega Yearly Meeting is presumed to have a large number of Quakers who have firm belief in their faith and practices (Quaker Report, 2020)

3.3 Target Population

The study targeted 1184 respondents. The respondents constituted the members of the Kakamega Yearly Meeting. Membership is confined to associate members and full members. Kakamega Yearly Meeting consists of 22 monthly meetings and every monthly meeting has 6 leaders in the administration. Further in every monthly meeting there are at least 2 village meetings making a sum up of 51 village meetings according to the data achieves at the Quaker Center at Handid (Quaker Report, 2020). According to the KYM constitution, constituted in 2015, each village meeting has 6 leaders in the administration who include: Presiding Clerk, Vice Presiding Clerk, Recording Clerk, Vice Recording Clerk, Treasurer and Main Pastor. Further in the village meetings, there are departments with their leaders which include YFP with 6 leaders, USFW with 6 leaders, Quaker men has 6 leaders and Sunday school has 2 leaders. These will form the Key informants of the study. The congregants and youths will also form part of the respondents.

3.4 Sample Size and Sampling Techniques

The study used purposive sampling of villages that have access to Information and Communication Technology and are connected to the power grid shall be used to provide in-depth information on the role of Information and Communication Technology. According to the KYM Report (2019), a total of 12 monthly meetings were selected out of 22 monthly meetings that are at least ICT compliant. This included: Kakamega Friends Church(Amalemba), Kefingo Friends Church, Nabongo Friends Church, Shikoti Friends Church, Ikonyero Friends Church, Mumias (Shibale) Friends Church, Munzakhula Friends Church, Handid Friends Church(HQ), Ichina Friends Church, Shanderema Friends Church and Shikulu Friends Church (KYM Report, 2019).

There was stratified random sampling of 20 members from the congregation of the 12 village meetings sampled. The 20 members from every monthly meeting sampled had 6 Quakermen members, 6 USFW members, 6 YFP members and 2 members who are ICT literate from either department. This totalled to 240 members from the congregation that participated in the study. The church leadership, KYM leadership and youth were sampled using purposive sampling .It was because of the researcher targeting the respondents who have an understanding of ICT applications in KYM and have an understanding of Quaker worship.

The Key informants from these monthly meeting who were sampled out included Presiding Clerk, Vice Presiding Clerk, Recording Clerk, Vice Recording Clerk, Treasurer and Main Pastor who form the church leadership according to FCK (1986) on the structure of leadership in Friends (Quaker Church).This gave to a total of 72 key respondents, 6 leaders from the 12 monthly meetings sampled. 36 leaders were sampled using from the 72 leaders using stratified random sampling with the intention of having a youth leader, an elder with history of Quakerism and ICT and ICT literate leader from any of the departments. The researcher sampled 3 key respondent from every monthly sampled to have 36 respondents from the leadership.

The Kakamega Yearly Meeting Office leadership was sampled out purposively that has 7 members as Key informants with knowledge on the History of Quakerism in Kakamega County; History of interaction of ICT in KYM and the Quaker worship beliefs and practices of KYM and ICT influence on them. This leadership includes the presiding clerk, vice presiding clerk, recording clerk, assistant recording clerk, treasurer, vice treasurer and general superintendent (KYM Report, 2019).

The researcher sampled out purposely from every Monthly meeting 2 pastors with a target of pastors who utilize ICT equipment in daily and during worship; and those who have been in the KYM longer to have history of Quaker Worship and ICT. This formed a total of 24 pastors and 1 General Superintendent who is the head of spiritual matters in the KYM. Youths and Leadership that forms part of the key informants who formed FDG to discuss: ICT equipment are being used at KYM during Quaker worship; how ICT influenced the Quaker Worship at KYM and what hinders the KYM from adopting ICT in the Quaker Worship. Purposive sampling was used to sample 3 youths from every monthly meeting that was sampled out to give a total of 36 respondents. Stratified Random Sampling was used to sample from the leadership of the sampled 12 monthly meetings. 3 leaders were identified from every monthly meeting to make the FDG leaders to have 6 respondents each. The total number of key respondents was 380 out of the 1184 registered members which is 32 % of the total registered members of the 12 sampled monthly meetings.

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3.5 Data Collection Instruments

Primary data and secondary data were used in this study. Primary data was through interview schedules, FGD, Questionnaires and Observation. Secondary data was gathered from relevant sources such as published articles, journals, thesis and other materials.

3.5.1 Interview Schedules

Key informants of Kakamega Yearly Meeting were interviewed personally and virtually on the role of Information and Communication Technology in the church and how it has affected Quaker worship. They also answered the research question: What strategies were Kakamega Yearly Meeting made to remain steadfast on their practices and beliefs in the digital age? What is the history of Quakerism in Kakamega County? What are the beliefs and practices of Quaker Worship at KYM and how have they been influenced by ICT adoption at KYM ?

Telephone interviews were done but it had the limitation of cost of buying credit for the long telephone calls.The advantage that researchers experienced with conducting of the virtual interviews through telephone and ICT applications such as ZOOM and Google Meet was the ability to record the interviews for future reference and understanding.

3.5.2 Questionnaires

A total of 240 Questionnaires were distributed to the respondents in the 12 monthly meetings sampled out by the researcher with the help of 2 research assistants. The Questionnaires were given to the respondents both physically and virtually. The researcher created online Questionnaires with the help of Google Sheets and Physical Questionnaires with the help of Microsoft Word.

3.5.3 Focus Group Discussions

Focus Group Discussions were conducted on 6th and 27th September 2020; 4th October and 1st November 2020; 29th November and 13th, 20th and 27th December. These dates were in line with the KYM programme of meetings when every monthly meeting that was sampled was having a Monthly Meeting for Worship at their respective village meetings chosen by the monthly meeting leadership.

Groups formed entailed key informants included: Digital immigrants (youths) and departmental leaders who are digital compliant helped to answer the research questions: What is the information and Communication Technology adopted in KYM? ; How has ICT influenced the Quaker Faith and Beliefs in KYM? and What strategies can be used to maintain the Quaker faith and beliefs but still adopt ICT in KYM? The FDG by the department heads also sought to answer: What is the History of ICT in Quaker Worship of KYM? and what are the beliefs and practices of Quaker Worship at KYM?

3.5.4 Observation

This method was used on 27th December during the Annual KYM Youth Conference, and 25th, 26th December 2020 and 1st January 2021, to collect information about how the congregation and leadership have adopted Information and Communication Technology. This method was also used to get to know some behavior involved with ICT equipment usage in worship and outside the KYM that may be habitual routines of which people are hardly aware. This involved both participant observation and non-participant observation. Observation also helped the researcher to know the behavior of the group and also authenticate the truth in the statements made by the informants in interviews and questionnaires.

3.5.5 Secondary Data

Secondary data was collected from literature reviews such as articles, journals, booklets and books. There were manual platforms like physical literature or online platforms like websites. This helped the researcher answer the research question: How has the Quaker way of worship changed to date in KYM with the influence of ICT?

3.6 Validity and Reliability of the Research Instruments

A pilot study was conducted in Musingu Friends Church which falls under the Musingu Yearly Meeting. Internal consistency method was used to assess the reliability of empirical measurements. 10 questionnaires were issued to the congregation and 5 questionnaires to leaders for an interview. Pilot study was aimed to establish the reliability and validity of research instruments (Mugenda & Mugenda, 2003). This helped in determining whether the respondents understand the questions. It helped find out whether the questions asked could be interpreted correctly and at the same time correct any ambiguous questions.

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3.7 Data Analysis and Presentation

In the process of collecting the field data through Questionnaires, Focus Group Discussion and interview guides, large volumes of data were gathered. This collected data was tabulated and analyzed to answer the research question How ICT has an influence on the Quaker worship of Kakamega Yearly Meeting.

The researcher analyzed the behavioral changes and attitudes for the changes in the Kakamega Yearly Meeting worship when interacting with Information and Communication Technology. This was important for a social science study so as to ensure all relevant data to have comparisons and analysis available. Once collected the data was computed along certain measures so that patterns of relationship that exist from the data may be observed and recorded. The analyzed data was discussed in light of the statement of the problem to help give a conclusion.

IV. FINDINGS & DISCUSSIONS

This chapter presents and discusses the findings from the data collected. The study's primary objectives were to examine how Information and Communication Technology (ICT) influences Quaker worship practices (independent variables) at Kakamega Yearly Meeting (KYM), including key values like silence, simplicity, and communal discernment. The dependent variables in this study are the ICT tools and practices introduced at KYM, such as online worship services, mobile apps for Bible study, projectors/screens, and mobile money for offerings. The findings from this study are discussed with reference to these objectives, highlighting the impact of ICT on the core worship practices and values.

4.1 Types of ICT Equipment Used at Kakamega Yearly Meeting

Table 1

ICT Equipment Usage in Kakamega Yearly Meeting

ICT Tool	Frequency	Percentage (%)
Mobile Phones	62	30.8
Projectors/TV Screens	62	30.6
Online Bible Apps	39	19.3
Recorded Music	31	15.4
Social Media Platforms	23	11.6

Mobile/telephones were the most common ICT instruments used for church services and accounted for 30.8% (62 respondents). This could be because mobile phones were readily available amongst the church members. Mobile phones, especially smartphones have dominated the daily lives of the most congregants and therefore, they are an important determinant of church services. Smartphones and micro-computers predominance in the 21st century saw the invention of online bible apps for usage by smartphones and computers. This led to churches engaging in televangelism which led to increased usage of online bibles.

Collectively, Video cameras/projectors/TV screens usage in the projection of the church service accounted for 30.6% (62 respondents). The findings were corroborated with findings from a key informant 1 stated that: Sermon projection ICT equipment such as TV screens, projectors and laptops are used for church services – sermon and projection of songs and the sermon. Social media platforms are used for communication and sharing of church service information. (interview, Technologist at Mumias on Sunday 2.00 pm). This explains that at Mumias Monthly meeting ICT equipment was being used in the worship as projectors and laptops that projected songs and sermons Social media was used for sharing information and communication amongst members.

4.2 How ICT is being used in Kakamega Yearly Meeting

The researcher sought to establish how the information and communication technology equipment are used by Kakamega Yearly Meeting Friends Quakers churches. Cameras both still and videography according to 18 respondents (14%) have been used to capture important moments of the church such as project launches, wedding and dedication ceremonies, praise and worship, funerals and critical sermons. Recorded Music are been used by the Youths during presentation. The Praise and worship Team has recorded music especially live sessions and forwarded to online platforms such as WhatsApp, Facebook and Youtube as a way of spreading the Good News to different audiences and it has also worked as a way of storage for future references. Recorded beats and sounds have been used as accompaniment during worship session and has brought some life and fine rhythm during singing of hymns and praises (29%). According to 36 respondents (57 %) Mobile phones have been used mostly outside the church as a means of communication between members. The church leadership has used text messaging and WhatsApp groups in

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Mobile Phones to pass along important messages and inform people of special occasions. This has replaced the usual business meetings during worship and the normal notice board as a way of communication,

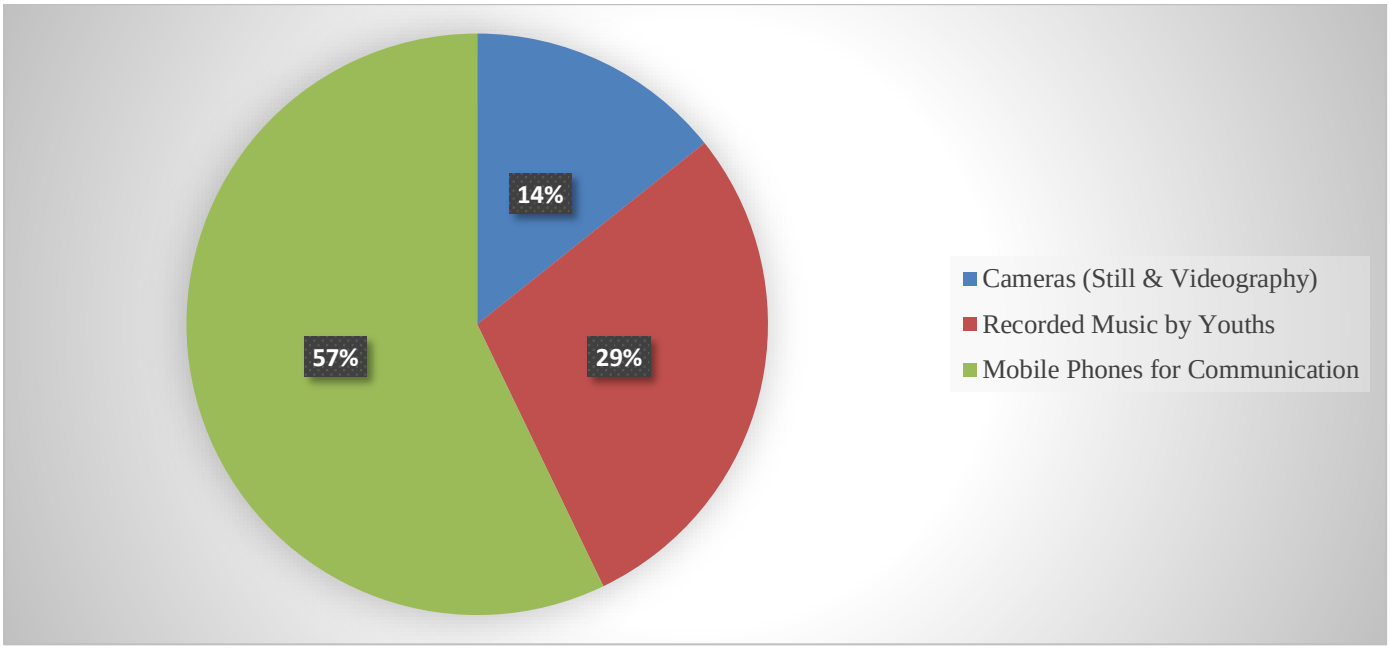

Figure 1
ICT Tools Used in Worship at Kakamega Yearly Meeting

4.2.1 ICT Equipment for Worship Beyond the Church

Information and community technology has an infrastructure that utilizes both hardware and software. This makes information dissemination and communication possible. Church sermons traditionally were delivered from a physical bible; however, with the invention of online Bible applications, most churches use both online and offline to deliver sermons. Kakamega Yearly Meeting is not left behind, the online bible accounts for about 19% (39 respondents) of the equipment used for online services. Musicians of the gospel have also increased due to the availability of ICT equipment in churches that made it possible to nurture talent. Recorded music in Kakamega Yearly Meeting accounted for 15 % (31 respondents) while text messaging for church announcements accounted for 12 % (23 respondents)

Looking at this, the study found that ICT is vital for growth and development in worship in Kenya and beyond. Such as the way the Quaker (Religious Society of Friends) grew wings after its inception in England in 1650s. Camera (Video and still) accounted for 8% (15 respondents) however, they are essential for necessitating online services especially by providing the material that is used on social media such as WhatsApp, Facebook, Twitter and YouTube channels among others. Computer systems (smartphones, projectors, computers etc.) are at the center of ICT usage in church services. Information and communication dissemination are a resultant of the computer systems usage. Kakamega Yearly Meeting makes use of these computer systems according to 93 respondents (46%). This makes it important and at par with the current trends in worship and praise.

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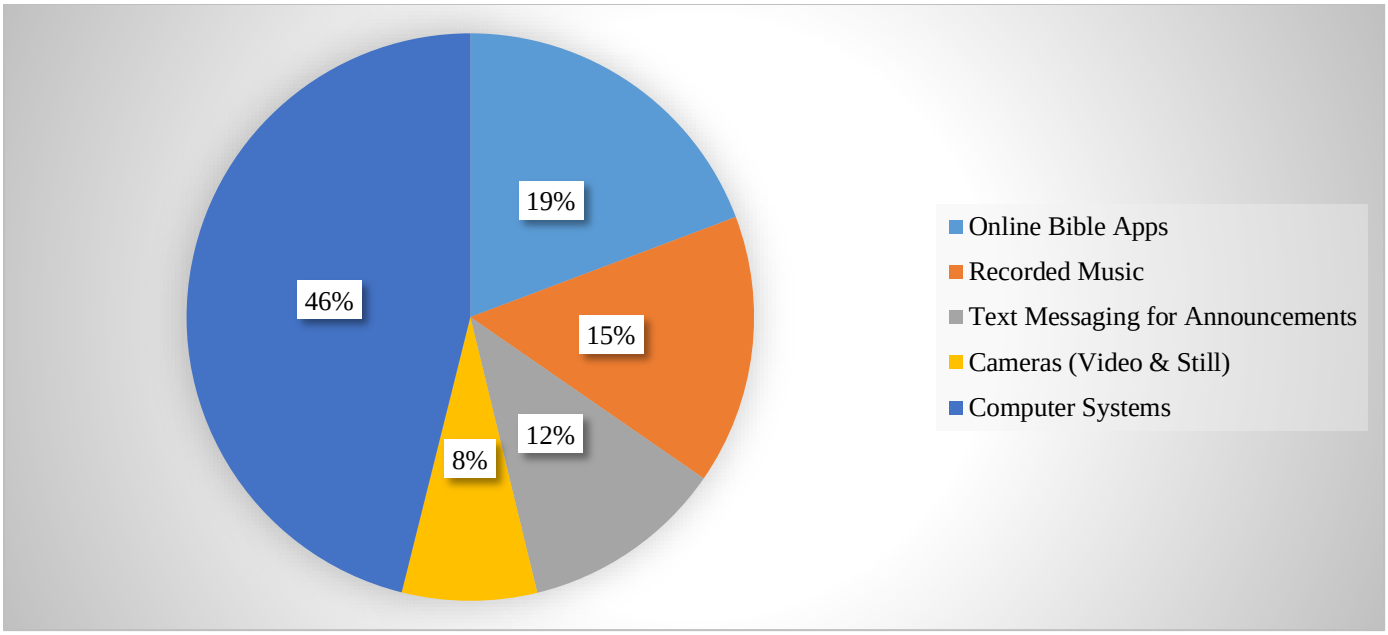

Figure 2
ICT Equipment for Worship beyond the Church

4.2.2 Online Platforms used at Kakamega Yearly Meeting Church Worship

KYM uses the following ICT equipment: musical instruments, projectors, screens, monitors, mobile phones and computers. They further use ICT applications in computers and mobile phones for online worship. The ICT applications include WhatsApp, Facebook, Twitter, Zoom, Google Meet and Emails. They are used for communication and improvement of worship experience. Computer systems (smartphones, projectors, computers etc.) are at the center of ICT usage in church services. Information and communication dissemination are a resultant of the computer systems usage. Kakamega Yearly Meeting makes use of these computer systems (72 %). This makes it important and at par with the current trends in worship and praise. Mobile phones (28%) have been used mostly outside the church as a means of communication between members. The church leadership has used text messaging and WhatsApp groups in Mobile Phones to pass along important messages and inform people of special occasions.

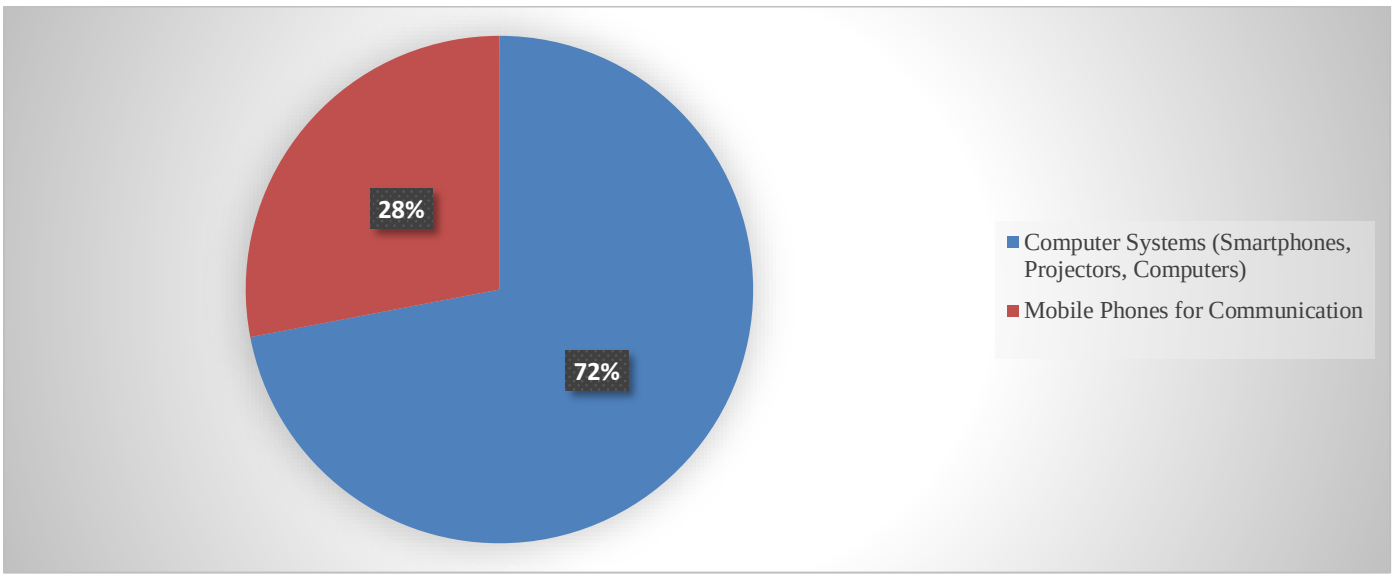

Figure 3
ICT Equipment Usage in Worship and Communication at Kakamega Yearly Meeting

4.2.3 The Influence of ICT on the Quaker Beliefs and Practices

According to 78 respondents (30%) stated that musical instruments attracted them to frequently attend church services every Sunday. The Younger generation especially the millennials have an attraction to entertainment thus ICT usage in churches is a precursor of their continuous attendance. The church leadership has a big responsibility of keeping the youths in line regarding salvation and service to the Almighty God, and leave in the footsteps of Christ

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Jesus. Microcomputers such as laptops and projector are gadgets that are controlled by the youths of Kakamega Yearly Meeting that accounted for fifteen percent in this study (38 respondents). New technologies of video making and photo editing are areas that have the maximum attention of the youth. The youth participants in this study, 25 percent (62 respondents) opined that cameras (video and still) were used. According to 78 respondents (30%), it was made clear that church services were facilitated through smartphones. This is in line with a report of Dyikuk (2017) on the position of the Youth and ICT in church

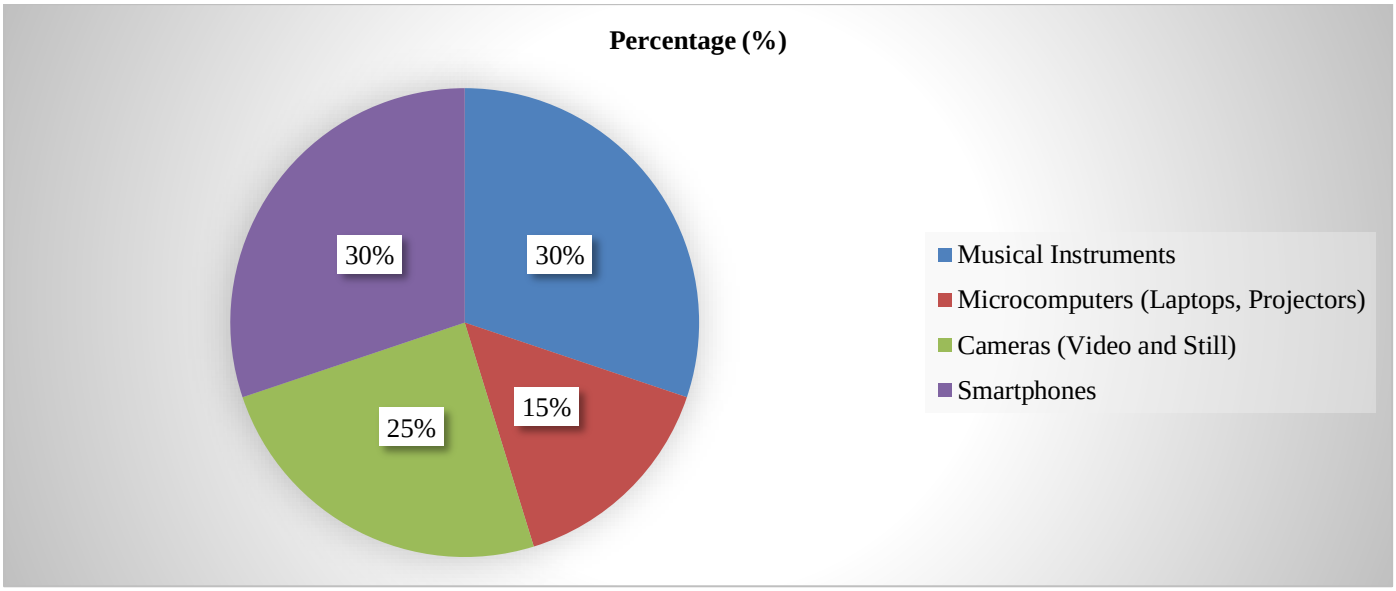

Figure 3
The Influence of ICT on the Quaker Beliefs and Practices

The technology promotes the availability of the young, middle age and the old in church services where the youths yearn to learn to the technology, the youth want to use the technology and the old seek to have technology help them address current trends of doing things in the church and frequency of participation. Teleconferencing and telecommuting are the current forms of church attendance for those far from their church or at work. It is a demand for churches to have a functioning information and communication framework that can be broadcasted to reach far and wide. Moreover, social media platforms are helping in addressing the gaps in virtual church service attendance.

The use of instrumentation such as the keyboard, violin, trumpets, saxophones, recorders, tambourine, drum sets, microphones, speakers, computer systems in praise and worship and sermon preparation has encouraged information and communication technology. Hence ICT has come up with certain Computer Applications that harmonize all musical instruments in one. This helps in reduction of cost of buying instruments rather than installation of an application in a computer. This provides for different sound effects and motions.

The use of vernacular language in praise and worship and sermon delivery has been a norm for a very long time dating back to 1902; a tradition that has been embraced by all Friends Quakers in Kenya. Information and communication technology have limitations in vernacular language thus only permitting English and to some extent Swahili for programming and guiding the service. Especially for viewers on social media who are not necessarily versed with the vernacular language. Therefore, the Friends Quaker brethren have to accommodate English as part of their new way of worship.

Churches nowadays manage their records and financial transactions and accounting using information and communication technology. Keeping records of the church members, service plans, development plans, tithing and offertory statements that is easily shareable with the church congregants. This has made service easy and transparent for Kakamega Yearly Meetings and the monthly meetings in Kakamega County. This is in reference to Kuboye et al. (2019) and Gacengechi (2016) on the use of ICT in churches for accountability.

According to the Leadership of the Church, ICT found itself in the church when there was need to digitize their data and record keeping .This is in reference to a research study done by Matasio (2017). Records Management in Friends Church (Quakers) in Kenya gives a recommendation on the need to keep church records electronically. The leadership resorted to digitalization of its records in 2014 by the introduction of Computers and IT experts for data entry and analysis. They set up a database and database for all members linked to their Village Cells .The church stored all important documents in the cloud including Title Deeds and Tenders done. Further accounting is done in a computerized manner especially the offertory and any projects done. These findings are in line Akpojovwo (2020) on the opportunity ICT offers in terms of church data storage.

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According to key Informants in one of the village meetings in KYM, the youths formed a group called Digital Church in the 2015 that started using a projector and a laptop to showcase sermons; bible verses and hymns especially Tsinyimbu Tsia Nyasaye during the service. This is a youthful group contain experts in the Information Technology field. Announcements were also broadcasted or recorded prior the Sunday service and displayed during the service in order to reduce time wastage.

One of the Village meeting Pastor as Key informant stated that the church started printing its own programs and reports in 2005.It acquired its first desktop and printer to be able to do printing anytime .The cost of outside printing was higher and also confidentiality of information was important hence need to acquire one. The programmes printed had a section of announcements, sermons and a loose leaflet for visitors to register with the village meeting. These programmes acted as a reminder of what the sermons were and what events were to follow. This conquers with the impact presented by Gutenberg Famous Printing Press on the spread of good news and printing of the Bible by Martin Luther (Eisenstein, 1979).

4.2.4 Influence of ICT on Worship according to KYM Congregants Responses

Information and communication technology is critically important in the 21st century. Many activities are connected to ICT. Globally, ICT is influencing the way of worship in churches. Televangelism became famous in the early 21st century where many churches took to online platforms especially Television stations and Radio stations. This study found that ICT has been an important contributor towards improved church service delivery and members' attendance, according to 97 respondents (48.5%). The members' attendance grew by about 15.4% according to Kakamega Yearly Meeting records. This was positive feedback that had been influenced by ICT in promoting church services. Church services at Kakamega Yearly Meeting have been made easy by ICT usage due to improved efficiencies in service delivery.

The youths are an important part of church progress; their involvement in church and church activities is at the center of raising a God-fearing generation. It was clear for this study that ICT promoted youth engagement in church services and activities. The ICT usage in Kakamega Yearly Meeting has seen the diversification of worship and praise as well as other church services, according to 46 respondents (23.1%). The diversification has led to changes in the traditional dispensation of sermons and interaction among members and the church leadership.

It is in the public domain that in late 2019 December, the novel coronavirus pandemic erupted in East Asia. By March of 2020, Kenya reported this pandemic that led to the closure of major socio-economic activities; curfew and lockdowns were imposed on the citizenry of Kenya among other countries globally. During this time, ICT was critical in the continuity of church services and networking. This study found out that Kakamega Yearly Meeting was able to continue due to ICT usage, according to 15 respondents (7.7%). The online services have made sermon and worship accessible to many congregants remotely during COVID19 pandemic tough times.

Table 2

Perceived Impact of ICT on Church Services

Category	Respondents	Percentage
Improved service delivery and members' attendance	97	48.5%
Promoted youth engagement and diversified services	46	23.1%
Enabled continuity of services during COVID-19	15	7.7%
Other/Not specified	42	20.7%
Total	200	100%

ICT has increased and maintained the population of KYM that was deviating due to the digital or technological migration. This happened when the leadership of the church accepted the use of musical instruments in the church, TV screens and projectors during worship. The church was getting extinct. The use of online platforms such as YouTube and Facebook has helped pastors get in touch with their members beyond the physical church. Members can still get sermons and teachings in their homes. The Online platforms have also given pastors bigger congregations that are non-members of these churches and they are inspired by their works for the Lord. This refers to what Kathambi et al. (2021) states on how ICT has helped churches increase membership in order not to be extinct.

4.2.5 Influence of Information and Communication Technology Equipment away from the Church

The researcher also sought to investigate the influence of ICT among Quakers away from the church. Therefore, the researcher sought to establish the participation level by the congregants in ICT integration, ease of accessing church information using ICT, extent of promoting live streaming, the level of clarity as supported by ICT and the encouragement level of the members as a result of ICT integration in church services.

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According to 23.1% (46 respondents), ICT has influenced the congregation participation in offertory and tithing. The ability to attract more youths in the church has increased the numbers in the churches hence more giving. The online flock also has contributed towards giving of offertory and tithe especially with the use of Mobile Money and online banking in churches. Offering and tithing can be done anywhere or in the church via Paybill numbers and till number. Also the transparency that comes with accounting using applications and information availability on finances has given confidence to the congregation to give out towards projects, charity, offertory and tithing.

Moreover, it was established that according to 46 respondents (23.1%) congregant participation in live streaming has helped members to follow church proceedings in their comfort zone and also comment during the services. Members can sing along and worship at their homes and this increases church members and active participation. Which implies that regardless of the distance, still a congregant could still participate in the church services away from the church premises. This has promoted networking and connectivity. This adheres to the accessibility of information and equality to all according to the Quaker core values and practices

According to 15 respondents "(7.7%)" ,ICT has influenced the members' church attendance. The inclusion of voice enhancement in church through microphones and speakers fine-tuned by a computer application has contributed to more members attending the service physically. The usual dull and boring hymn singing has been hyped up by the musical beats and rhythm from drum sets, keyboards, guitar and mixers. This has led to an increase of active members' attendance. This has encouraged congregation participation and sense of belonging according to the Quaker Faith and practices

ICT has influenced the church clarity in service delivery according to 15 respondents (7.7%). Accounting applications have been used to compute and give an analysis of the church's tithing and offertory in real time. This records and data can be easily accessed by anybody and are posted in the WhatsApp church groups. This has brought clarity and transparency between the church leadership and members. Record keeping has been digitalized as it was recommended by Matasio (2017) thesis on Records Management in Friends Church (Quakers) in Kenya that that for the Friends Church to achieve operational efficiency, it is important that the church leadership establish records management offices that are equipped with requisite resources to effectively manage paper based records and electronic records. This promotes integrity in the KYM which is a core value and practice among the Quaker worship.

Table 3

Influence of ICT among Quakers Away from the Church

Category of Influence	Respondents	Percentage	Key Insights
Participation in offertory and tithing	46	23.1%	Increased giving through Mobile Money and online banking; enhanced transparency and trust in church funds.
Participation in live streaming	46	23.1%	Members follow services remotely; increased participation and engagement from home.
Influence on church attendance	15	7.7%	Improved attendance due to enhanced sound and musical elements in worship.
Clarity in service delivery	15	7.7%	Use of accounting apps and WhatsApp groups enhances transparency and real-time financial reporting.

Finally, the study found out that with the use of ICT equipment, such as zoom, Microsoft meet and other social media platforms such Instagram, WhatsApp, Twitter and Facebook teleconferencing is audible thus encouraging members to connect to church sermons at a remote location. With the introduction of ICT in churches has led to online churches. The internet has made it easy to have online service hence a term by Mullins (2011) known as online churches which has affected the Kakamega Yearly Meeting Directly.

4.2.6 Influence of Online Platform on Worship in Church

Online platforms have made the sermon accessible to members in the church. Members who cannot see the preacher or the singers due to distance and may have eyesight and hearing impairment can follow the service online at their comfort. This supports the Quaker practice of equality for all during worship especially on accessing information. However some key respondents state that Online Sermons have created a different type of believers who do not know each other physically and they are not friends as it is for Quakers. They mostly don't belong to any department in church and cannot be identified as associate members of full t members. They are also not linked to any Home cell within the church locality hence referred as Diaspora by some members. This goes against the Quaker belief of sense of belonging and communism.

Online platforms have given sermons and praises a great touch, attracting a good online audience across the world. This is a great milestone for the KYM however the online audiences can't be categorized as active or passive participants in the service. The online audience does not give Pentecostal responses Example when a pastor says "Praise the Lord" do they respond Amen or they are dormant. Further the Pastors can't tell if they are following the

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service and worshiping together because they can't be seen answering to non-verbal clues. It i also affirmed by a key respondent

Online platforms are more efficient as stated by 30.8 % (61)respondents . These findings are in line with Kuboye et al. (2019) on how ICT has helped churches and missionaries to be effective and efficient. However a Key Informant at the Accounting Office of the one churches states that the equipment is very expensive. The Online Sermons and worship require expensive and confiscated equipment to be able to achieve 100% transmission to the viewer. They require good smartphones by the recipient to receive the information and good computer application and computer hardware to present the information to the viewer. The Equipment that run Zoom Meetings, Google Meet and Live streaming come with a lot of financial sacrifices by the church. There is also a need to procure a good internet bandwidth of high speed to transmit the data to the recipient. These findings are in reference to Kathambi et al., (2021) on how ICT tools and platforms are expensive to maintain and purchase. This also goes against the Quaker practices and principles of simplicity because ICT tools are complexity to use. The inability to purchase them by some members and churches goes against equality to access them due to the cost that separates the rich and the poor.

4.2.7 Influence of Online Platform away from the Church

The surveyed participants, according to Figure 6.5, 35.9% (72 respondents) stated that integration of Information and Communication Technology led to enhanced connectivity and networking of congregants away from the church premises. In addition, 25.6% (51 respondents) stated that an online platform integrating ICT made it easy for them to stay connected with the current issues of the Kakamega Yearly Meeting. This was observed as convenient for members to receive services at a remote location according to 36 respondents (17.9%). Besides, sermon delivery was efficient that even contributed to an increase in church membership.

Online platforms have increased connectivity and networking of the members away from the church according to 35.9% (72 respondents). The WhatsApp groups created by homecells and Village meetings have helped members to know each other and support one another in good or bad times. Example funeral and wedding contributions are done on online platforms. Members share opportunities available in their working environment and alerts of impending dangers around. Messages of encouragement and spiritual nourishment are shared amongst members with inclusion of morning devotions and prayer. This has brought communism in the KYM which is a principle of Quaker worship.

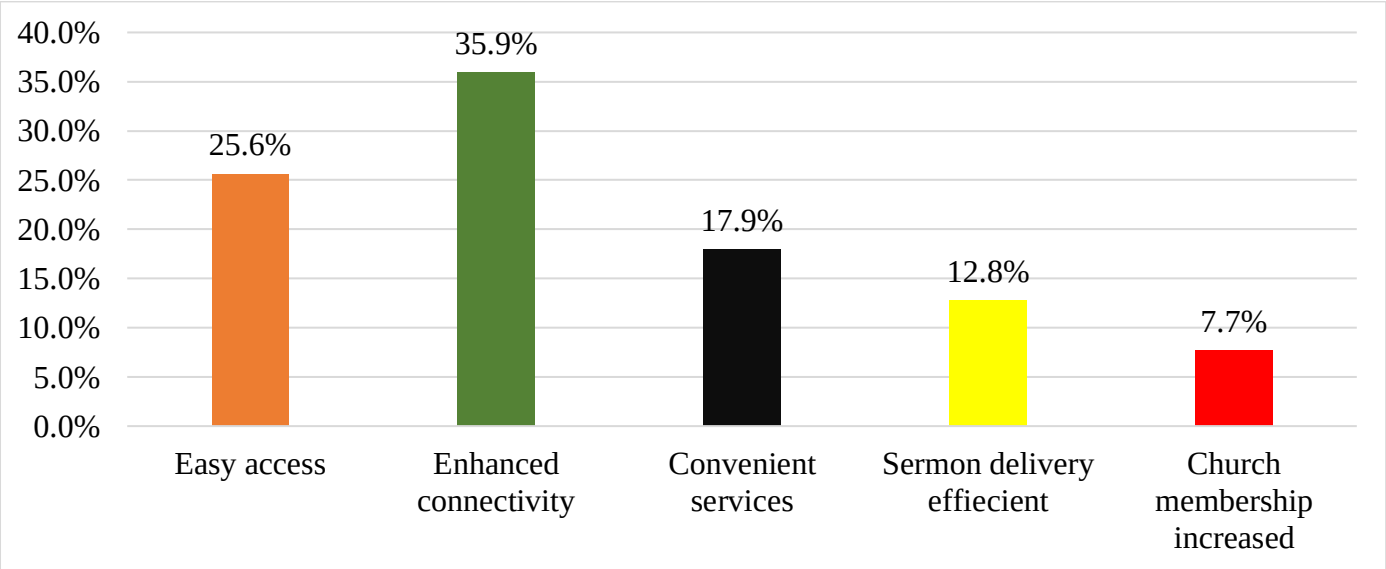

Figure 4

Online Platform Influence on Worship away from the Church

Online platform has helped KYM offer convenient services such as offertory, tithing, baptism lessons to be done online away from church. Notes on baptism and membership are offered online by members in the catechism class but final examination by the leadership and pastors are done physically. Online platforms have given the KYM options of members giving their offertory, project contribution and tithing through Pay bill and Till Numbers. Prayer Requests are done through websites and Facebook pages and pastors give guidelines in response. Online platforms have created a church away from the physical churches where members share and learn new songs and hymns; they provide a platform to know and analyze the Quaker Faith and Practices within members. This emphasized equality as a Quaker Core value through creating a platform for all in terms of giving and accessibility to information.

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Online platforms have made information within the KYM easily accessible by anyone away from the church. New and updates on the next order of services is shared in the platform, whether it's a family service, monthly service or a normal service. Members get information of upcoming events such funerals, weddings, dedications, baptism, fundraising, charity and Harvest services in advance, which helps them prepare for the service.

4.2.8 Influence of ICT on how the church leadership conducts its services as part of Quaker Worship

According to a key respondent (17th October 2020) states that monitors or screens have established an easy way to project the main sermons, announcements and even the bibles. These have acted as aids for pastors and leaders in their service delivery. It is a medium of projection of information and announcements to the screens and projectors. Phones and cameras have helped in creating videos and taking photos of events. Smartphones are used in airing service through media platforms such as Facebook, Instagram and YouTube channels. Members are able to sing, pray and preach using microphones.

According to a key respondent (17th January 2021)ICT equipment such as computers and its application such as excel and database has helped the Church keep accurate and proper fund records and also has enabled the church advertise its future plans such as strategic plans and fundraisings. This is a way to promote integrity which is a core value of Quaker worship. Laptops have been used as a way of storing data and documents. Information recorded by video and audio gadgets can be later watched other than normal times of church service. This finding is in line with Armstrong et al., (2001) on ICT usage on administration and finance of the church in Nigeria.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The distinctive character of Quaker worship is anchored in the core values of simplicity, direct communion with the Divine, integrity, and communal discernment. These principles not only shape the Quaker approach to spirituality but also inform their enduring commitment to social justice and peace. Foundational practices such as silent worship, vocal ministry, and a commitment to egalitarianism are central to Quaker belief, facilitating a direct and unmediated connection with God. These values, established by the movement's founder, George Fox, continue to be the bedrock of Quaker identity today.

The arrival of Quakerism in Kakamega County was facilitated through key missionary efforts, beginning with the Vihiga Friends Mission in 1905 and expanding through the Lirhanda and Malava Friends Missions. The Kakamega Yearly Meeting (KYM) was formally constituted in 1993, growing from its origins in the Lirhanda Friends Mission to become a significant regional entity, ultimately forming 21 monthly meetings. The integration of Information and Communication Technology (ICT) into KYM commenced in 2002; initially driven by university students and seminars from the National Council of Churches of Kenya (NCCK). A pivotal moment was the introduction of musical instruments by Muganda through missionaries, which marked the beginning of ICT adoption at KYM and subsequently transformed worship practices.

In summary, while the integration of ICT at KYM has yielded significant benefits in terms of accessibility, engagement, and communication, it has concurrently introduced challenges to essential Quaker values like simplicity and silence. This study highlights the critical need to strike a balance between embracing modern technological tools and preserving the profound spiritual depth of Quaker worship. To safeguard Quaker principles, KYM leadership should implement strategic measures. These include developing clear guidelines for ICT integration, fostering education on discernment and the value of silent worship, and creating minimalist worship tools. By adopting such a mindful approach, KYM can continue to leverage the advantages of ICT while steadfastly upholding the integrity of its worship and preserving its core values of simplicity, silence, and direct communion with the Divine.

5.2 Recommendations

To effectively balance technological integration with core Quaker values, the findings suggest three strategic approaches. First, it's essential to establish clear guidelines for "Quaker-appropriate" technology use, which includes safeguarding designated tech-free periods to ensure undisturbed contemplation. Second, the issue of accessibility must be addressed by implementing solutions such as device-lending programs and digital literacy training, while always ensuring non-digital alternatives remain available. Third, innovation should be values-centered, focusing on the development of minimalist worship tools and the appointment of technology stewards to guide thoughtful implementation. These strategies should be adopted gradually, guided by traditional Quaker discernment processes. This allows individual monthly meetings to adapt the recommendations to their specific contexts, while denominational unity is maintained through the oversight of the yearly meeting.

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REFERENCES

Ajani, O. T., & Adeyemi, A. R. (2019). Communication technology: Tool for changing the face of worship in Christian religion in Nigeria. *KIU Journal of Humanities*, *4*(2), 45–52.

Akpojovwo, E. U. (2020). The impact of information and communication technology in Christianity in Oredo local government area of Edo State [Unpublished undergraduate project]. University of Benin.

Armstrong, N. S., Spiegel, A., & Wimmer, J. (2001). Information technology in congregations. *The Christian Century, 118*(1), 7–14.

Briggs, A. (2013). *The history of broadcasting in the United Kingdom: Volume I: The birth of broadcasting*. Oxford University Press.

Campbell, H. A. (2017). Surveying theoretical approaches within digital religion studies. *New Media & Society, 19*(1), 15–24.

Campbell, H. A., & DeLashmutt, M. W. (2014). Studying technology and ecclesiology in online multi-site worship. *Journal of Contemporary Religion, 29*(2), 267–285.

Campbell, H. A., & Vitullo, A. (2016). Assessing changes in the study of religious communities in digital religion studies. *Church, Communication and Culture, 1*(1), 73–89.

Creswell, J. W. (1994). *Research design: Qualitative and quantitative approaches*. Sage.

Dyikuk, J. J. (2017). Christianity and the digital age: Sustaining the online church. *International Journal of Journalism and Mass Communication, 3*(1), 43–49.

Eisenstein, E. L. (1979). *The printing press as an agent of change: Communications and cultural transformations in early-modern Europe* (Vols. 1–2). Cambridge University Press.

Ezeabata, I. P. (2024). An evaluation of information communication technology effects on the Anglican Church worship in Nigeria. *Crowther Journal of Arts and Humanities, 1*(2), 25–27.

FCK. (1986). *Document: Friends Church (Quaker) of Kenya, faith and practices*.

Freeman, T. (2017). Theology of religions: Models for interreligious dialogue in South Africa. In *Theology of religions* (Suppl. 12, Vol. 73(6), a4842). *HTS Theological Studies*. https://doi.org/10.4102/hts.v73i6.4842

Gacengechi, H. (2016). A framework for the adoption of information and communication technology in faith-based organizations in Kenya: A case of Comboni Missions [Doctoral dissertation, Strathmore University].

Kathambi, F., Gitome, J., & Bwire, J. P. (2021). Integration of information and communication technology in church worship. *International Journal of Innovative Research in Science, Engineering and Technology, 2*(11), 1–3.

Kenworthy, L. S. (1952). *Quaker leaders speak*. Friends United Press.

Kinya, L. J. (2023). Influence of spiritual-economic projects on growth of the Methodist Church in Kenya: A case of Kaaga Synod, Kenya [Doctoral dissertation, Kenya Methodist University].

Kuboye, B. M., Oloja, S. V., & Obolo, O. A. (2019). Evaluation of the usage of ICT in the church finance in Nigeria. *International Journal of Applied Information Systems, 12*(23), 20–34.

KYM Report. (2019). Kakamega yearly meeting of Friends Church (Quakers) Ejinja local church annual report 2019.

Magezi, V. (2015). Technologically changing African context and usage of information communication and technology in churches: Towards discerning emerging identities in church practice (a case study of two Zimbabwean cities). *HTS Theological Studies, 71*(2), 1–8.

Matasio, J. F. (2017). Records management in Friends Church (Quakers) in Kenya [Doctoral dissertation, University of South Africa].

Mavhunga, E. (2019). Exposing pathways for developing teacher pedagogical content knowledge at the topic level in science. In *Repositioning pedagogical content knowledge in teachers' knowledge for teaching science* (pp. 131–150). Springer Nature Singapore.

McDonnell, J. (2014). Digital religion: Understanding religious practice in new media worlds. *Communication Research Trends, 33*(1), 37.

Mugenda, O., & Mugenda, A. (2003). *Research methods: Quantitative and qualitative approaches*. Acts Press.

Mullins, J. (2011). Online church: A biblical community [Unpublished thesis]. Palm Beach Gardens, Florida.

Newton, N. (2024). How Quaker schools create environments conducive to learning. In *Values, relationships and engagement in Quaker education: Student perspectives on inclusive school cultures* (pp. 175–194). Springer International Publishing.

Omotayo, F. O. (2017). Adoption and use of information and communication technologies by Pentecostal churches in Ibadan, Nigeria. *Journal of Librarianship and Information Science, 49*(2), 222–233.

Orlikowski, W. J. (1992). The duality of technology: Rethinking the concept of technology in organizations. *Organization Science, 3*(3), 398–427.

Quaker Center at Handid. (2020). Report on the membership of the Kakamega Yearly Meeting (2019–2020). [Internal report].

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Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. Wiley.

Smith, D. (2019). Worship in a digital age: Exploring the impact of digital technology on contemporary worship practices. *Journal of Media and Religion, 18*(2–3), 129–146.

Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences on the longwall method of coal-getting. *Human Relations, 4*(1), 3–38.

Yamuremye, E., Mberia, H. K., & Nabuzale, C. (2022). Influence of integrated marketing communications tools on adoption of telecommunications innovations. *International Journal of Sciences: Basic and Applied Research, 61*(1), 10–24.

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Cost effects of assistive devices on the household welfare of persons with disabilities in Kakamega County, Kenya

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ABSTRACT

This study analysed the relationship between the cost of assistive devices and the household welfare of persons with disabilities (PWDs) in Kakamega County, Kenya. The main objective of the study was to investigate the cost effects of assistive devices on household welfare for PWDs in Kakamega County, Kenya. The study had two specific objectives: to find out the effects of the economic costs of assistive devices and labour costs of assistive devices on the household welfare for persons with disabilities in Kakamega, Kenya. This study was limited to the social model theory of disability. The period from 2020 to 2022 encompasses the onset and aftermath of the COVID-19 pandemic, which had significant economic, social, and health impacts globally and in Kenya. The pandemic intensified challenges for persons with disabilities, such as increased costs of healthcare, limited mobility due to lockdowns, and disruptions in the supply chain for assistive devices. A descriptive survey design was adopted. The study target was the 1110 registered PWDs in Kakamega County. The proportionate sampling technique was used to get the 113-sample size. A closed-ended questionnaire was used to collect the data. A pilot study was undertaken in Vihiga County to pre-test the validity and reliability of the study. The SPSS software version 20 was used to analyse the data. Anonymity, consent and confidentiality were adhered to. The study applied both descriptive and inferential statistics. Frequency tables, percentages, as well as correlations and regressions were used to present and analyse the data. The findings generally indicated that most persons with disabilities found assistive devices unaffordable, whether for purchase, maintenance, repair, or replacement of parts. Consequently, households often faced the difficult choice between supporting their PWD siblings and participating in their own economic activities. As a result, many households experienced economic downturns, as they expended significant time or financial resources assisting their PWD siblings with assistive devices, often at the expense of engaging in other productive activities. Ultimately, households bore this cost by struggling to participate in other gainful socio-economic pursuits. These outcomes were affirmed by regression analysis, which showed that labour costs of assistive devices were significantly associated with improved household welfare ($\beta = 0.169$, $p = 0.004$), while economic cost was not ($p = 0.695$). Among demographic factors, primary disability type ($\beta = -0.245$, $p < 0.001$) and highest education level attained ($\beta = 0.873$, $p < 0.001$) significantly influenced household welfare, whereas age, gender, and marital status did not have a significant effect. The findings underscore the importance of education and the affordability of assistive devices for PWD households. The study recommends increasing the availability of cost-effective and efficient assistive devices in households. There is also a need for collective responsibility to initiate reasonable and expanded interventions that would empower vulnerable PWD households in Kakamega County.

Keywords: Assistive Devices, Cost Effects, Household Welfare, Labour Costs, Persons with Disabilities

I. INTRODUCTION

International Classification of Functioning Disability and Health define disability as an umbrella word that encompasses impairments, activity limitations, and participation restrictions adding that disability is a contextual variable, dynamic over time and in relation to circumstances. People with disabilities may be excluded from the workforce and wealth creation platforms, have limited educational opportunities and or face institutional barriers that restrict their earnings (Smith, *et al.*, 2024). Consequently, this leads to lower standards of living among people with disabilities. The World Bank estimates that 20% of the world's poorest people have some kind of disability, and tend to be regarded in their own communities as the most disadvantaged.

The prevalence of disability in Africa is often higher due to factors such as conflict, poor healthcare access, and disease. This translates to over 80 million people in Africa live with a disability. Estimates show that only 5-15% of PWDs in low-income countries, including many in Africa, have access to the assistive devices they need (World Health Organization, 2024). The World Health Organization (WHO, 2024), approximates that 1.3 billion (16%)

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people experience significant disability globally. The United Nations (UN) on the other hand approximates that close to 80 million Africans live with various forms of disability (UN, 2019).

The Kenya Population and Housing Census (KPHC, 2019) reports that 2.2% or 0.9 million of Kenyans above five years live with some form of disability, and a majority are living in rural areas. In a different survey, the Kenya National Survey of People with Disability (KNS-PWD) found that around 4.6% of the population (not aggregated by age), or 1.7 million Kenyans, live with a form of disability. Generally, 1.9% of men have a disability as compared to 2.5% of women (KPHC, 2019). People with disabilities (PWDs) in Kenya live in a vicious cycle of poverty due to stigmatization, limited education opportunities, inadequate access to economic opportunities, and access to the labour market (Zikhali, 2024).

Data from Kenya National Bureau of Statistics (KNBS) shows that Kakamega County is the second after Meru County with population of PWDs (Kenya National Bureau of Statistics [KNBS], 2019). To address the challenges that PWDS face, the government enacted several policy documents that gradually contributed to the sustenance of the poor and vulnerable populations. Article 20 of the Constitution of Kenya for instance grants the administration's obligation to the advanced recognition of the rights of all Kenyans.

This is further buttressed in Article 43 which guarantees the right to the maximum standard of health care and services, education, accessible and adequate housing, food security, access to clean water, and social security with an emphasis on providing for those unable to support themselves or their dependents (Constitution of Kenya, 2010). The government put in measures such as establishment of a State Agency i.e. the National Council for People with Disabilities (NCPWD) to deal with disability issues, the provision of wheel chairs, white cane, sunscreen lotions and other assistive technologies in addition to establishing a Disability Fund.

Provision of assistive devices and services to persons with disabilities in Kenya enable them to actively engage in society. These include wheelchairs, crutches, hearing aids, calipers, surgical boots and prosthetic arms or legs. A sign language interpreter is also included as provision of an assistive service. Priority is given to those in need of assistance in work, training and learning environments. Limited studies have shown how PWDs suffer in regards to the effect of the cost of this device in improving the living standards of the persons with disabilities. For instance, Ganle et al. (2020), Calvert (2021) and Gupta and Priyadarshi (2020) among other studies agree that PWDs still face multiple challenges among them those of mobility, health issues, educational challenges and participation in income generational activities.

Because of the looming challenges that face disadvantaged people with disabilities, the Government of Kenya identified disability inclusion as a criterion to the attainment of the Sustainable Development Goals (SDGs) and its fundamental initiative 'leaving no one behind' (Mitra et al., 2017; Abualghaib *et al*, 2019). To do this, the government incessantly strived to ensure that PWDs were accounted for and could participate equally in every aspect of life. This helped in enhancing equal opportunity, inclusion, justice and economic growth for the nation. The government for instance established several interventions of improving the living standards of persons with disabilities. One of the approaches include the provision of PWDs with devices that assist them in leading a normal life. Priority is given to those in need of assistance at work, training and learning environments

While it is important to consider the financial and long-term impacts of assistive devices, prioritizing cost-effectiveness may lead to overlooking expensive but potentially more effective solutions for people with disabilities. A study conducted by Garland-Thomson (2020), and confirmed by Waitoller and Gorham (2021) found that focusing solely on maximizing impact through resource allocation may neglect the importance of preferences and needs in selecting assistive devices. It is essential therefore to consider a holistic approach when addressing the needs of people with disabilities (Abualghaib *et al*, 2019). This includes considering unique abilities, challenges, and personal preferences to ensure that assistive devices are more suitable or effective for the individual. This consideration would lower chances of probable frustration, decreased independence, and a lack of success in performing daily tasks.

In most cases, assistive devices must be customized to every individual in terms of size, fitting and some other considerations (Pinilla-Roncancio & Alkire, 2021). While personalized care is important, it is also crucial to consider that not all individuals have access to or can afford customized assistive devices. In some cases, individuals may have to accept generic options that may not fully meet their needs. Madans et al. (2017) however, indicate that the generic options could still provide some level of support and functionality for those who need them. It is important in the long run to explore all available options and resources to find the best solution for the specific needs of persons with disabilities. In some cases, customization or additional support may be necessary to ensure the best possible outcome. This may involve working closely with a healthcare provider or specialist to identify the most effective approach.

1.1 Statement of the Problem

Kakamega County has a total population of 1,867,579 with a prevalence rate of disability at 2.9% which is slightly higher than the National disability prevalence rate of 2.2% (KPHC 2019). There is a strong link between poverty and disability where Johner (2016) reveals that poor people have a higher risk of acquiring a disability

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because they are more exposed to disabling diseases and conditions. At the same time, disability increases the possibility of falling into poverty by being excluded from participation of development initiatives (Pinilla-Roncancio & Alkire, 2021). People with disabilities may be excluded from the workforce and wealth creation platforms, have limited educational opportunities and or face institutional barriers that restrict their earnings (Smith *et al.*, 2024). Consequently, this leads to lower standards of living among people with disabilities. Data from World Health Organization (2024) indicates that 80% of disabilities are acquired majorly through chronic illnesses, accidents, and aging. PWDS often face higher poverty rates compared to the general population due to factors such as limited access to education, employment and social services.

The overall poverty level in Kakamega County stands at 49.2% making it one of the counties with the highest poverty rates in Kenya (KNBS, 2019). Given the 49.2% overall poverty rate in Kakamega, it is reasonable to infer that the poverty rate among PWDS in the County is higher due to additional barriers they face. Statistics have indicated that 2.5 billion PWDs need one or more assistive devices, yet nearly one billion of them are denied access where accessibility can be as low as 3%. Affordability is the major barrier to access (WHO, 2024). The number of people in need of assistive devices is likely to rise to 3.5 billion because of increase in the prevalence of non-communicable diseases (WHO, 2024). The WHOs Global Report on Assistive devices presents evidence on the need and access to assistive products. Assistive devices that were covered by National Health Insurance are only 7 out of 50 types recommended by WHO (KNBS, 2019). This means PWDS have to purchase out of pocket to get the device or rely on family and friends for financial support. There are limited studies that highlight how the cost of assistive devices affects the household welfare of PWDs.

A study by Restrepo (2015) that used comparable data from 14 developing countries found not only that people with disabilities tended to be less well off in terms of education, employment, living conditions, consumption and health, but also that, on average, households with disabilities also report spending a higher fraction of their expenditure on health care. The study did not shade light on how the cost of assistive devices affected the household welfare of persons with disabilities. This study has helped the researcher to a more understanding there has been an increased and progressive interest in the study of living conditions of people with disabilities.

Further, understanding that people with disabilities fully depend on others for their independence, there is scarce data on living standards of these people even when they possess assistive devices. Therefore, this study aims to fill this gap by shedding more light on the costs and welfare effects of assistive devices to bring about long-term solutions.

1.2 Research Objective

i. To find out effects of Economic Costs of assistive devices on household welfare for persons with disabilities in Kakamega County.
ii. To determine the labour costs effects of Assistive Devices on the household welfare for persons with disabilities in Kakamega County, Kenya.

1.3 Research Hypothesis

Ho_1: Economic Costs of assistive devices significantly affect household welfare for persons with disabilities in Kakamega County.

Ho_2: Labour cost effects of Assistive Devices significantly affect the household welfare for persons with disabilities in Kakamega County.

II. LITERATURE REVIEW

2.1 Theoretical Review

The Social Model of Disability, developed by Mike Oliver in 1980, shifts the focus from individual impairments to the societal barriers that restrict people with disabilities. It challenges the traditional view of disability as an individual problem, arguing that by removing social, environmental, and economic barriers, individuals with impairments can fully participate in society The Social Model also emphasizes that when people with disabilities are denied access to assistive devices, they are excluded from education, employment, and social life, reinforcing negative stereotypes and deepening social exclusion (Johner, 2016). This perpetuates cycles of poverty and dependency, placing additional strain on households and limiting the potential contributions of people with disabilities to their communities. In areas with limited resources like Kakamega County, the high cost of assistive devices exacerbates these challenges and underscores the need for collective action. The cost of assistive devices places a heavy financial burden on low-income households, which are often already struggling with reduced income and additional care responsibilities. These financial challenges diminish household welfare and restrict the independence and

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opportunities of individuals with disabilities. Without affordable access to assistive devices, families face further marginalization and economic stress.

2.2 Empirical Review

2.2.1 Economic Costs of Assistive Devices on Household Welfare for persons with Disabilities

A study by Mitra *et al*. (2017) showed that in low-income countries, the upfront cost of devices like wheelchairs or hearing aids often exceeds the average household's monthly income, resulting in financial strain and reduced access. A study by Yeager *et al.* (2018) highlighted that caregivers in households with PWDs who use assistive devices experienced reduced caregiving responsibilities and stress levels, allowing them to engage in more paid work or entrepreneurial activities. Caregivers who previously spent up to 40% of their time providing direct care were able to redirect their time towards income-generating activities after their dependents received assistive devices.

A Kenyan study by Owuor *et al.* (2021) indicated that households in rural areas, such as Kakamega, spend between 20-40% of their income on acquiring assistive devices, limiting their capacity to meet other essential needs like food, education, and housings in a study focusing on Kenya, Owuor *et al*. (2021) demonstrated that access to assistive devices facilitated greater participation of PWDs in both formal and informal sectors. Households with PWDs who had access to assistive devices reported a 25% increase in monthly income due to improved work opportunities and productivity. The use of assistive devices is associated with reduced healthcare costs and lower levels of dependency, leading to long-term economic benefits for households.

The costs associated with maintaining and repairing assistive devices also contribute significantly to household financial burdens. According to Borg and Ostergren (2014), regular maintenance is necessary to ensure device functionality, yet the expenses for parts, repairs, and professional services are often prohibitive for many families. The found that maintenance costs can account for up to 15% of the initial purchase price annually, further straining household budgets and potentially leading to the abandonment of devices. Indirect costs also include increased healthcare expenditures. Some studies suggest that assistive devices, intend to improve quality of life, but they can necessitate additional medical consultations, rehabilitation services, and special accommodations. Owuor et al. (2021) reported that households with PWDs often incur 50% higher healthcare costs than those without, due to the need for specialized care and device-related health issues.

2.2.2 Labour Costs Effects of Assistive Devices on the Household Welfare for Persons with Disabilities

A study by Owuor *et al*. (2021) in Kenya demonstrated that assistive devices like prosthetic limbs and wheelchairs increased the mobility of PWDs, allowing them to access workplaces that were previously inaccessible. The study further revealed that individuals with disabilities who used assistive devices were employed at higher rates in the education, healthcare, and information technology sectors compared to those without such devices

According to a study by Cook and Polgar (2019), assistive technologies help reduce workplace fatigue and injury, enabling employees with disabilities to maintain their job performance and retain employment. The study found that employees who used appropriate assistive devices were more likely to advance in their careers due to increased productivity, independence, and confidence in their work.

A study by Phillips and Zhao (2020) found that assistive devices such as ergonomic workstations, speech recognition software, and mobility aids significantly increased the productivity of employees with physical disabilities by enabling them to work more comfortably and efficiently. It was found that access to affordable assistive devices led to a 20% increase in employment rates for PWDs in both formal and informal sectors. In the context of Kenya, a study by WHO (2024) observed that farmers with disabilities who used assistive tools such as adaptive ploughing and modified farming equipment increased their agricultural productivity by 30% compared to those who did not use such devices.

A research study by De Jonge *et al*. (2016) indicated that assistive devices minimize pain and discomfort associated with specific disabilities, leading to reduced absenteeism and higher job satisfaction. It was found that employees using assistive technologies reported higher levels of job satisfaction due to reduced barriers to task completion and greater workplace inclusion. Research by Palmer and Saval (2021) in Turkey demonstrated that PWDs who used assistive technologies had significantly lower dependency levels on co-workers and supervisors, which positively impacted their overall productivity and workplace integration through community sensitization and capacity-building workshops. These efforts resulted in enhanced social inclusion, greater acceptance in workplaces, and increased access to services.

Research by De Jonge *et al*. (2016) showed that assistive devices reduced the need for frequent medical visits, hospitalizations, and long-term care, which are typically expensive and a significant economic burden for families. It was found that older adults using assistive devices for mobility and self-care experienced a reduction in healthcare expenditures by up to 35%. This reduction in direct healthcare costs indirectly benefits the economic welfare of households, allowing for the allocation of resources to other essential needs such as education, nutrition, and housing.

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According to a study by Layton and Boulr (2020), households that invest in assistive devices often experience significant cost savings over time due to reduced need for paid care giving services and lower healthcare expenses. This allows for better financial planning, savings, and the potential to invest in assets such as property, education, or small businesses. Households with PWDs who used assistive devices reported a 15% increase in savings over five years, leading to improved financial stability (Layton & Boulr, 2020).

III. METHODOLOGY

3.1 Research Design

The study adopted a descriptive survey research design. This design is particularly appropriate as it allows for a comprehensive understanding of both the quantitative and qualitative aspects of the issue. By integrating both approaches, the study can effectively measure the economic impact of assistive devices on household welfare while also capturing the lived experiences and perceptions of individuals with disabilities.

3.3 Target Population

The target population for the study was the 1110 PWDS in Kakamega County registered with the National Councils of Persons with disability (NCPD, January 2020-December 2022). Using stratified sampling, method, the study sample size was 113 participants.

3.4 Sample Size and Sampling Technique

The target population for the study was all PWDS in Kakamega County registered with the National Councils of Persons with disability (NCPD, January 2020-December 2022). This study was carried out in all the 12-sub county. The proportionate stratified sampling was the sampling method of this study.

Table 1

Showing Target Population

SR.NO	Sub County's	Total Population	Sample size
	Lugari Sub-County	90	9
	Likuyani Sub-County	100	10
	Navakholo Sub-County	35	4
	Lurambi Sub-County	120	12
	Malava Sub-County	55	6
	Ikolomani Sub-County	45	5
	Shinyalu Sub-County	220	22
	Kakamega Central Sub-County	110	11
	Mumias East Sub-County	140	14
	Mumias West Sub-County	95	10
	Matungu Sub-County	30	3
	Butere Sub-County	70	7
Total		**1110**	**113**

3.5 Data Collection Instrument

Primary data was collected. The selected PWDs were informed prior to the days of study. The introductory letter from university was read to the selected respondents. Any concerns and questions from the respondents were attended to at this time. This study utilized closed ended questionnaires with a five-point Likert scale items. If the disabled person was not available, too young or unable to comprehend the questionnaire, a suitable proxy was asked to respond on his/her behalf. The questionnaires collected personal information of the respondents and that concerning the cost of assistive devices on household welfare. They were distributed to the respondents by the researcher and interpretation was made on a need basis through use of research assistants mostly specialized in sign language interpretation. This method was appropriate since it was easy to analyze and classify the collected information especially on closed ended questions. It also catered for this large population in relation to available time. To ensure reliability and validity, a pilot study was conducted in Sabatia Sub County, Vihiga County. The scores obtained were correlated using SPSS version 20.

3.6 Data Analysis

The researcher employed descriptive (frequencies, percentages, Means , standard deviations and variances) and inferential statistics (regression analysis) were used to analyse quantitative data. Faraway (2002) argued multiple

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regression is used when analyzing statistical significance of more than two independent variables on one dependent variable. For the purposes of this study, the following linear regression model was used:

$Y= \alpha+ \beta_1 X_1 + \beta_2 X_2 +$ ……. Model 1

Where;

Y= Aggregate mean score of Household welfare

α = y-intercept/constant

β_1 =Regression coefficient for Economic cost of assistive devices

X_1= Aggregate mean score of Economic cost of assistive devices

β_2 =Regression coefficient for Labour cost of assistive devices

X_2 =Aggregate mean score of Labour cost of assistive devices

ε = error term-random variation due to other unmeasured factors

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3.8 Ethical Considerations

In carrying this out, strict ethical standards were very necessary to make sure that all the participants were adequately taken care of and respected. The ethical principles of respect to persons, beneficence, justice, and informed consent were of interest in this study since they are essential in preserving the integrity of the research and the wellbeing of the participants. The Masinde Muliro University of Science and Technology, Ministry of Social Services, Sports, Youth, Gender and Culture and NCPDs Kakamega chapter granted the ethical approval to undertake this research.

Such a principle as Respect for Persons is based on the acknowledgment of autonomy and dignity of each party participant and specifically persons with disabilities, which can be termed a vulnerable group. In this study, the participants were adequately informed concerning the nature of the study, its purpose, the possible risks, and benefits of the study. They had the liberty to make a free choice on whether to take part or withdraw at any stage with no form of coercion or consequences. Also, the researcher employed communication means that can be agreed on by the participants to achieve ease in communication like sign language, Braille or whichever other forms interpretable by the participants to ascertain that they are aware of what the study is all about and what the researcher is expected to do to his/her participants.

The critical ethical requirement was to ensure the consulting of informed consent. Detailed information was given to the participants or their legal guardians where that is involved about the study in a language and format acceptable and readily understood by the participants. Consent form was provided, purpose of the study, involved methods of data collection, risks and benefits as well as measures to maintain confidentiality. Consent was given freely and was devoid of any pressure or undue influence. Participants who had a cognitive impairment such as those who may not be in a position to grasp the information surrounding the study were fully assisted to help them move in the direction of realizing their rights to participate.

Participant secrecy and confidentiality was secured during the research process. To protect identity and personal details of participants, the researcher took steps to anonymize the data and save all the sensitive details securely. The principle of beneficence was adhered to. The study was intended to act in the best interest of the participants as well as society at large and reduce any possible harm.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

This study issued 113 questionnaires and upon the end of the data collection period, a total of 97 of the questionnaires that were returned were approved for analysis considering factors such as completeness of the survey and eligibility of respondents. This led to a response rate of $^{97}/_{113}$ which is equivalent to 85.8%. From 324 questionnaires distributed all were filled and returned indicating a response rate of 100%. The study also found that 14(77.8%) Church leaders responded as all clergy responded in interviews.

4.1.1 Demographic Characteristics of the Respondents

The demographic data collected from respondents include their gender, age, marital status and education. The findings show that half of the respondents were aged 18-39 years i.e. 25.8% aged 18-29 and another 25.8% aged 30-39 years. Apparently issues of disability mostly affect young people and young adults whether directly (the ones having a disability) or indirectly as caregivers etc. about a fifth of the respondents were aged 40-49 years while 17.5% were aged 50-59 years. The data on the gender of the respondents showed that more than two thirds of the respondents were female i.e. 68% while the male respondents were only 32% of the sample which aligns with secondary research that less men (1.9%) have a disability as compared to 2.5% of women (KPHC, 2019). Data on marital status of respondents showed that a majority of the respondents were either single or married. Two fifths were married (41.2%)

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while 37.1% of the respondents were single with only one in five respondents reporting to be widowed. This means that quite a substantial number of the persons with disability still suffer a stigma for towards marriage. Data about highest level of education of respondents indicated that a majority of the respondents did not school to the level of college or university education. From the data, half of the respondents had acquired secondary education, while a third had attained up to primary level of education. One in ten respondents had attained tertiary education whereas very few (3.1%) had vocational training and another 3.1% had no formal education. This is summarized in Figure 1

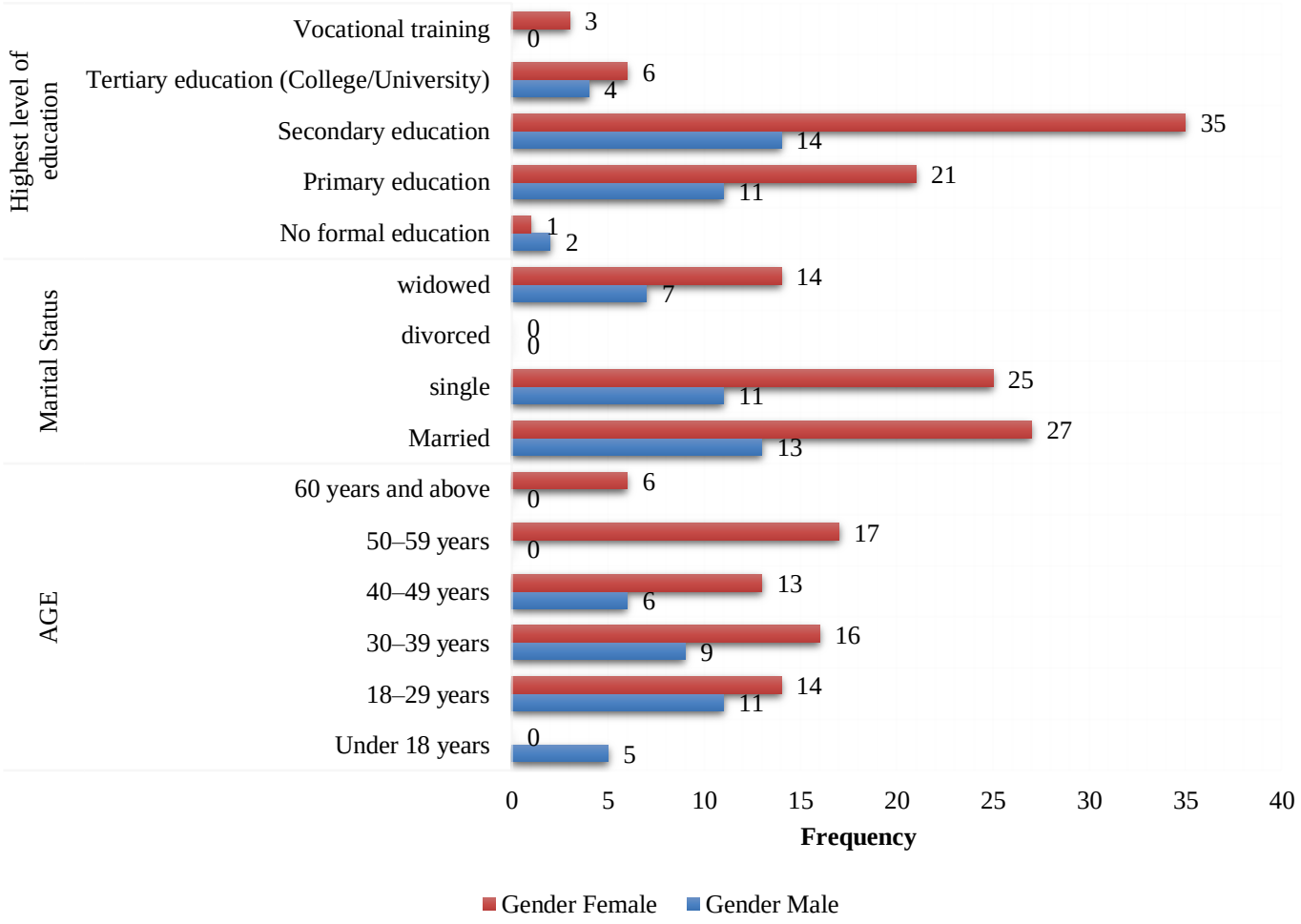

Figure 1
Demographic Characteristics

The findings imply that PWDs in Kakamega County face various obstacles in attaining higher education that could be attributed socio-economic factors such poverty. The study findings are consistent with research findings of Restrepo (2015) that found that people with disabilities tended to be less well off in terms of education, employment, living conditions, consumption and health The findings on demographic characteristics of the respondents were also presented in clustered cross tabulated bar charts shown below. Cross-tabulations indicate that the burden of disability lies more on women. There was no significant difference in terms of marital status for both genders. More PWD women attained vocational skills training compared to male PWDs.

4.1.3 The Primary Type of Disability Affecting the Household

This study investigated the types of disability and assistive devices that prevail among respondents as shown in the Figure 2.

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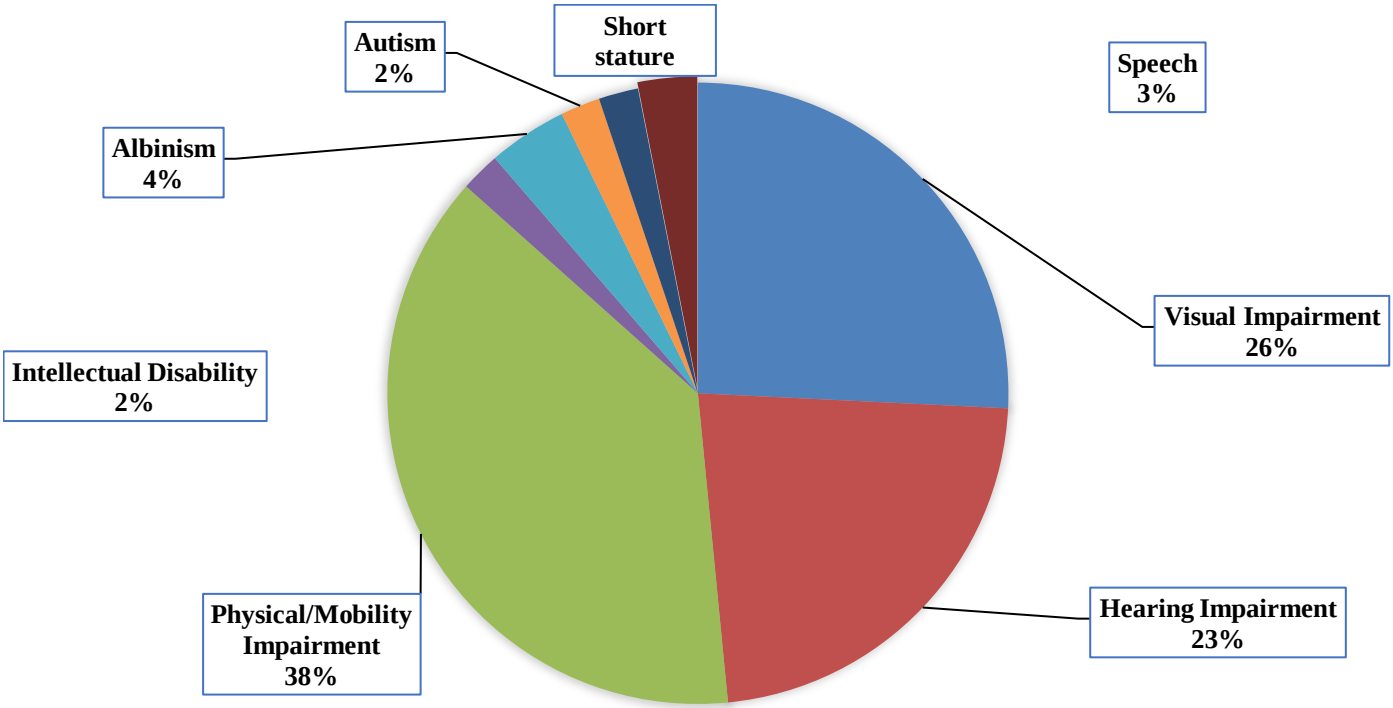

Figure 2
Demographic Characteristics

The data indicates the most prevalent type of disability was physical impairment which was prevalent among 38.1% of the respondents. This was followed by visual impairment with a prevalence of 25.8% and further hearing impairment with a 22.7% prevalence among the respondents. Intellectual disability was the least prevalent only among 2.1% of the respondents. Additionally, 11.3% of the respondents had other types of disabilities of which, 36.4% was albinism; autism and short stature each 18.2% prevalent while speech disability was 27.3%. This information is summarized in the below pie-chart.

4.2 Analysis of PWD Household Welfare

This study analyzed household welfare through four indicator variables on income levels, asset ownership, savings status and debt status of the respondents. The 10-scale rating findings are summarized in the table 1:

Table 1
PWD Household Welfare

	Mean	Std. Dev.	Variance
There is adequate income that helps to meet all the basic needs of the household such as food, shelter, education etc.	2.2165	.98136	.963
The household owns adequate arable land, domestic animals and a decent house	2.3711	1.18427	1.402
The household has enough savings to handle emergencies and other threatening eventualities	2.3505	.82967	.688
The household does not currently survive on loans from institutions, friends or relatives	2.4330	.97796	.956

N=97

Findings showed that the general welfare of PWD households was poor. The respondents did not generally have adequate incomes and neither did they own adequate productive assets. They also were not able to maintain savings for the future or emergencies but had accumulated reasonable amounts of debts from friends, relatives and

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other financing instructions. The households were underprivileged in most aspects because of insufficient mechanisms for support nor their own empowerment.

4.2.1 Effect of Economic Costs of Assistive Devices on Household Welfare

PWDs found it costly to acquire or purchase assistive devices as well as maintain, replace or upgrade parts as highlighted in the tables 2 and 3.

Table 2

Direct Economic Costs of Assistive Devices on Household Welfare

Variable	Mean	Std. Dev.	Variance
The initial purchase cost of the assistive device was affordable for my household	1.9588	1.145	1.311
The ongoing maintenance and repair costs of the assistive device are manageable for my household.	1.7216	1.077	1.161
The cost of replacing parts or upgrading the assistive device is affordable.	1.6495	.89024	.793

N=97

The findings generally indicated that majority of the respondents found assistive devices not affordable either during purchase or maintenance, repair and replacement of parts. Specifically, with a very low mean coefficient rating of 1.9588 and a standard deviation of 1.145, respondents strongly disagreed that the initial purchase cost of the assistive device was affordable for the household. Similarly, many respondents further strongly disagreed, with a mean coefficient rating of 1.7216 and a standard deviation of 1.077 that the ongoing maintenance and repair costs of the assistive device were manageable for their households. There was also a strong affirmation that the cost of replacing parts or upgrading the assistive device was not affordable based on the lowest mean rating of 1.6495 with a standard deviation of 1.077. The study findings are consistent with research results of Borg and Ostergren (2014) which linked the purchasing, maintaining and repairing assistive devices to be contributing significantly to household financial burdens.

In summary, PWDs found it costly to acquire or purchase assistive devices as well as maintain, replace or upgrade parts. This finding was consistent with past research on utilization of assistive technologies. For instance, Pinilla-Roncancio and Alkire (2021) found that poverty was a key indicator on the ability to acquire, maintain or upgrade assistive technologies and further reiterated by Palmer and Saval (2021) that inability to access appropriate assistive devices was a major challenge associated with disability population in Kakamega.

Table 3

In-Direct Economic Costs of Assistive Devices on Household Welfare

Variable	Mean	Std. Dev.	Variance
My household has incurred additional costs for transportation to acquire or maintain the assistive device.	3.7526	.85429	.730
The time spent on maintaining or servicing the assistive device is burdensome for the household.	4.4639	.70802	.501

N=97

The study found out that respondents faced challenges due to indirect costs of assistive devices which limited their proper participation in socio-economic activities. For instance, majority of the respondents agreed that their households had incurred additional costs for transportation to acquire or maintain the assistive devices as evident from the mean coefficient rating of 3.7526 with a standard deviation of 0.85429. Additionally, the respondents strongly agreed that the time spent on maintaining or servicing the assistive device was burdensome for the households based on a very high mean coefficient rating of 4.4639 with a standard deviation of 0.70802

4.2.2 Labour Costs of PWD Assistive Devices

Whereas it was costlier to purchase, maintain or upgrade assistive devices based on its type, in the event that the devices were acquired, they greatly improve the quality of life for persons with disability making this to be considered a worth opportunity cost for household members. This finding was also consistent with Phillips and Zhao (2020) who found that assistive devices significantly increased the productivity of employees with physical disabilities by enabling them to work more comfortably and efficiently. The tabulated data in table 4 refers to the long term labour costs associated with assistive devices.

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Table 4

Long Term Labour Costs Associated with Assistive Devices

	Mean	Std. Dev.	Variance
Over time, the labour costs associated with assistive devices have become a long-term burden on my household.	3.1546	1.53664	2.361
The increased time and effort required for assistive device maintenance have reduced the opportunity for household members to engage in full-time or part-time employment.	3.2784	1.34430	1.807
The labour input required for the use and maintenance of the assistive device is justified by the improvements it has made to the person with a disability's quality of life.	3.1959	1.32790	1.763

N=97

The findings denote that households have to choose between being there for their PWD siblings or participation in own economic activities. Consequently, majority of these households suffer economic downturns as they have to spend a lot of time or financial resources assisting their PWD siblings to use or maintain their assistive devises at the cost of participation in other productive activities. The household thus pays for this cost by finding it hard to participate in other gainful socio-economic activities consistent with earlier research conducted by Cook and Polgar (2019) on PWD assistive devices and productivity.

4.3 Inferential Analysis

4.3.1 R Square Model Analysis

The model shows an R square value of 0.696 which means that the model, in predicting the dependent variable, was 69.6% perfect. The table below presents data on the analysis of variance.

Table 5

Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.834[a]	.696	.686	.31072

a. Predictors: (Constant), , Economic Cost of Assistive Devices, Labour Costs of Assistive Devices

The variance presented a statistically significant model at 99% confidence interval where p-value was 0.000 and F coefficient of 71.009. This was an indicator that the regression model significantly predicted the dependent variable (household welfare).

Table 6

Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.567	3	6.856	71.009	.000[b]
	Residual	8.979	93	.097		
	Total	29.546	96			

a. Dependent Variable: Household Welfare

b. Predictors: (Constant),Economic Cost of Assistive Devices, Labour Costs of Assistive Devices

The regression coefficients as shown in Table 7 indicates that the relationship between Labour Costs of Assistive Devices and household welfare was statistically significant at the 99% confidence interval ($p = 0.004$, $t = 2.929$). In contrast, there was no statistically significant relationship between Economic Cost of Assistive Devices and household welfare ($p = 0.695$, $t = -0.393$).

Table 7

Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.490	.419		-1.169	.245
	Economic Cost of Assistive Devices	-.034	.086	-.022	-.393	.695
	Labour Costs of Assistive Devices	.188	.064	.169	2.929	.004

a. Dependent Variable: Household Welfare

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In view of the findings above, increased labour costs of assistive devices are significantly associated with improved household welfare. Conversely, economic cost of assistive devices did not show a significant relationship with household welfare in this model. These results suggest that enabling households to afford the labour costs associated with assistive devices may enhance their overall welfare, which is consistent with findings from De Jonge et al. (2016) and Layton and Boulr (2020).

4.3.2 Dependent Variable and Demographic Characteristics Effect

The study analyzed the relationship between the dependent variables and the demographic characteristics of PWDs. Regression coefficients are shown in the table below.

Table 8

Regression Coefficients for Demographic Characteristics

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.092	.155		13.535	.000
	Gender	-.081	.068	-.068	-1.195	.235
	Age	.040	.024	.097	1.686	.095
	Primary Disability Type	-.111	.024	-.245	-4.646	.000
	Marital Status	.035	.025	.073	1.411	.162
	Highest level of education	.608	.037	.873	16.387	.000

a. Dependent Variable: Household Welfare

From the regression statistics, the study showed that there was no statistically significant relationship between gender and household welfare (p value = 0.235). Likewise, the relationship between household welfare and age as well as marital status was not statistically significant where p-values respectively were 0.095 and 0.162. This means that household welfare status is not significantly dependent on age, gender and marital status. However, disability type and education level achieved significantly determine the household welfare status for people with disabilities where respectively the t-value was -4.646 and 16.387 both significant at a 99% confidence interval. The findings imply that the severability of disability has an inversely proportional impact on household welfare. Additional, when more PWD members access education and skills, the overall wellbeing of the household is improved.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Although it may be costlier to purchase, maintain or upgrade, assistive devices greatly improve the overall quality of life for persons with disability and acquisition of such devices is therefore a worth opportunity cost for household members. However, because the financial burden of the assistive devices, many households still find it difficult to participate in gainful socio-economic activities because of the need to cater for the needs of their PWD members. The ability to participate in gainful economic activities by PWDs is vital. However, this is possible when households can access affordable and maintenance-free assistive devices which allow saving of funds for investment to successfully contribute to household incomes. Therefore, highly organized and result driven interventions can help emancipate PWD communities in Kakamega County. Whereas there is an attempt to assist, the available support programmes are inaccessible to majority of the needy PWD households. As a result, the PWDs cannot relate with how such programmes contribute to their wellbeing. This then calls for an expansion of the support scope within Kakamega County to target as many vulnerable PWDs as possible in order to develop independence and empowerment of PWD. In conclusion, in order to improve the household welfare, the economic costs of assistive devices should be lowered. Household welfare for PWDS can also be improved when PWD members acquire education and training skills because this promotes their empowerment and independence.

5.2 Recommendations

The biggest challenge of PWDs in Kakamega County Kenya was high costs of assistive devices occasioned by limited inclusion in education and training. Therefore, this study recommends that the national and county governments, in collaboration with development partners, subsidize the cost of assistive devices or provide them at no cost to low-income households

Additionally, establishing community-based assistive technology programs could enhance access and reduce transportation or logistical costs, further easing the economic burden on affected households. Finally, it is recommended that more assistance or support to PWDs should also target their caregivers, aides and further cover

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aspects such as maintenance to ease the burden encountered by persons with disabilities especially in accessing assistive devices.

REFERENCES

Abualghaib, O., Groce, N., Simeu, N., Carew, M. T., & Mont, D. (2019). Making visible the invisible: Why disability-disaggregated data is vital to "leave no-one behind". *Sustainability, 11*(11), 3091.

Borg, G., & Ostergren, S. (2014). How does national culture influence IPO underpricing? *Pacific-Basin Finance Journal, 51*, 318–341.

Calvert, S. (2021). Challenges for people with disabilities. *Ballard Brief, 2021*(3), 6.

Constitution of Kenya. (2010). The Kenyan constitution: County governments. Nairobi, Kenya.

Cook, T., & Polgar, V. (2019). Pro-activeness and its effect on the survival of family-owned manufacturing companies in Kigali City, Rwanda. *International Journal of Research in Business and Social Science, 12*(5), 98–113.

De Jonge, D. N., Bon, J. J., Foster, M. M., Lakhani, A., Kendall, M., & Geraghty, T. (2016). Healthcare services for people with acquired disability in South-East Queensland, Australia: Assessing potential proximity and its association with service obstacles. *SSM-Population Health, 19*, 101209.

Faraway, B. (2002). Externalities and market failures of cryptocurrencies. *Journal of Cross-Cultural Psychology, 46*(10), 1273–1278.

Ganle, J. K., Baatiema, L., Quansah, R., & Danso-Appiah, A. (2020). Barriers facing persons with disability in accessing sexual and reproductive health services in sub-Saharan Africa: A systematic review. *PLOS ONE, 15*(10), e0238585.

Garland-Thomson, R. (2020). Integrating disability, transforming feminist theory. In *Feminist theory reader* (pp. 181–191). Routledge.

Gupta, A., & Priyadarshi, P. (2020). When affirmative action is not enough: Challenges in career development of persons with disability. *Equality, Diversity and Inclusion: An International Journal, 39*(6), 617–639.

Johner, H. (2016). Welfare theory, public action, and ethical values: Revisiting the history of welfare economics (Cambridge: Cambridge University Press, 2021), pp. ix+338, £75 (hardcover). ISBN: 9781108841450. *Journal of the History of Economic Thought, 45*(2), 356–360.

KNBS. (2019). *Kenya Population and Housing Census* (Vol. 4). Kenya National Bureau of Statistics.

KPHC. (2019). The impact of Covid-19 pandemic on the implementation of the university curriculum: A case of public universities in South Eastern Kenya.

Layton, N., & Boulr, A. (2020). Diversity beyond disability in assistive technology. *Assistive Technology, 36*(1), 1–2.

Madans, N., Loeb, H., & Eide, G. (2017). Exploring the capability approach to quality of life in disadvantaged population groups. *Scientific Reports, 12*(1), 15248.

Mitra, H., Fitzgerald, G., & Sheaf, G. (2017). The use of assistive devices in daily living. United Nations.

Owuor, J., Larkan, F., & MacLachlan, M. (2021). Does assistive technology contribute to social inclusion for people with intellectual disability? A systematic review protocols. *BMJ Open, 8*(2), e017533.

Palmer, B. V., & Saval, A. (2021). Assistive technology utilization and satisfaction in aging adults. *Journal of Gerontological Research, 12*(3), 215–229.

Phillips, O., & Zhao, L. (2020). A review and meta-analysis of research on the relationship between behavioural intentions and employee turnover. *Disability and Rehabilitation: Assistive Technology, 10*(1), 112–141.

Pinilla-Roncancio, M., & Alkire, S. (2021). How poor are people with disabilities? Evidence based on the global multidimensional poverty index. *Journal of Disability Policy Studies, 31*(4), 206–216.

Restrepo, A. (2015). Disability, living conditions and quality of life: The case of the municipality of Anapoima in rural Colombia. *Indian Journal of Clinical Psychology, 49*(4), 69–74.

Smith, E. M., Huff, S., Wescott, H., Daniel, R., & MacLachlan, M. (2024). Assistive technologies are central to the realization of the Convention on the Rights of Persons with Disabilities. *Disability and Rehabilitation: Assistive Technology, 19*(2), 486–491.

United Nations. (2019). A double challenge for the disabled: Stigma prevents many people with disabilities from entering the workforce. United Nations.

Waitoller, N., & Gorham, J. (2021). How poor are people with disabilities? Evidence based on the global multidimensional poverty. *Journal of Applied Psychology, 1*(1), 31.

World Health Organization. (2024). Disability, key facts. World Health Organization. Yeager, K. H., Gandara, G. A., & Martinez, C. (2018). "It's bigger than me:" Influence of social support on the development of self-advocacy for college students with disabilities. *Journal of Postsecondary Education and Disability, 35*(2), 145–159.

Zikhali, P. (2024). Poverty and social exclusion in Kenya. *International Journal of Poverty, Investment and Development, 4*(1), 1–21.

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The effect of employee engagement on organisational performance: A case study of Muhimbili Orthopaedic Institute (MOI), Tanzania

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ABSTRACT

This study intended to assess the impact of employee engagement on organisational effectiveness, using the Muhimbili Orthopaedic Institute in Tanzania as a case study. Specifically, it investigated the effect of employee engagement on organisational performance. Guided by Human Capital Theory, the study adopted a case study design within a quantitative research framework. Data were collected through structured questionnaires administered to 222 respondents. Analysis was conducted using SPSS version 21, employing correlation techniques, with results presented in statistical tables. The findings indicated a significant positive correlation between employee engagement and organisational performance, underscoring their critical role in enhancing institutional effectiveness. Based on these results, the study recommends that Muhimbili Orthopaedic Institute establish clear key performance indicators (KPIs). These KPIs should link training outcomes with patient satisfaction, staff productivity, and surgical success rates. The study also recommends connecting engagement initiatives directly with organisational performance. Furthermore, it advocates for a National Health Workforce Engagement Policy. This policy should promote employee involvement, recognition, and well-being across public health institutions. The Muhimbili Orthopaedic Institute can serve as a model for its implementation.

Keywords: Employee Training, Employee Engagement, Muhimbili Orthopaedic Institute, Organization Performance, Tanzania

I. INTRODUCTION

Employee engagement is defined as the emotional commitment and involvement of employees in carrying out their daily responsibilities within the organization (Ouhammou & Manar, 2024). Employee development through training seeks to align organisational objectives with employees' needs and aspirations (Sanga, 2024). As noted by Mwamakula (2024), career training is essential in building employees' capabilities to perform new roles, which are often evaluated based on productivity. Institutions implement staff training and development programs to strengthen employees' skills, competencies, and knowledge (Abubakar, 2024; Pinto et al., 2020). Evidence from the United Kingdom and the United States shows that strategic training initiatives foster greater employee engagement, which in turn enhances retention, drives organisational innovation, and improves overall performance (Smith & Brown, 2023; Johnson et al., 2022). Both countries emphasize providing accurate information to support decision-making and cultivating continuous learning cultures that boost market efficiency. In contrast, China increasingly recognizes staff training and engagement as essential for sustaining its rapidly growing industrial sector, promoting both skill development and workplace participation (Li & Wang, 2023). However, the situation in North Korea differs significantly, as government restrictions greatly limit exposure to global practices, resulting in insufficient data on staff training and employee engagement in the country (Kim & Park, 2022).

Most literature across the African continent highlights that many organizations invest in continuous training initiatives to foster innovation, reduce turnover, and enhance organisational efficiency (Adeyemi & Yusuf, 2023; Mensah & Boateng, 2023). Specifically, training initiatives in South Africa and Nigeria, coupled with the growing emphasis on employee engagement, have been shown to boost morale and job satisfaction, which translate into improved performance (Nkosi & Mbatha, 2024). Furthermore, participatory and engagement mechanisms in Ghana, Kenya, Uganda, and Tanzania have been reported to strengthen employee commitment, reduce turnover, and elevate staff morale (Muller, 2018; Kariuki, 2023). In Egypt, comprehensive training and engagement programs are strongly associated with improved service quality and market sustainability across both public and private enterprises (El-Sayed & Hassan, 2024).

Usually, organizations are relevantly concerned with the legitimacy of their hiring practices and employees' career development to attain peak performance and competitive position (Mehale et al., 2021). In the study by Rani et al. (2024), career development and training is the cornerstone in building employees' confidence and competences. Research demonstrates that targeted training initiatives and employee participation are most important aspects in fueling

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healthcare outcomes, workplace performance and service quality provision in Tanzanian organizations (Mosha et al., 2022). Organizations that carry out career development opportunities also assist them in planning for their own and the company's future; and so preventing tardiness that could impair performance (Achackzai, 2024). In that regard, staff development helps organizations close the performance gap between present and predicted future performance (Mdhlalose, 2020).

Despite these efforts, challenges such as resource limitations, restricted access to continuous professional development, and infrastructural gaps continue to impede optimal organisational performance (Odanwu & Uchenna, 2024). Addressing these issues calls for integrated strategies that support sustainable training, enhance employee engagement, and build health system resilience to improve overall health outcomes in Tanzania (World Health Organization, 2023). In evaluating the impact of employee engagement on organisational effectiveness, prior studies have examined factors such as training materials and facilities, scheduling, delivery methods, and content, along with their associated outcomes (Odunayo & Fagbemide, 2024). Guided by this perspective, the present study adopts Human Capital Theory to assess the impact of employee engagement on organisational effectiveness, using Muhimbili Orthopaedic Institute in Tanzania as a case study.

1.1 Statement of the Problem

Empirical literatures such as Arulsamy et al. (2024), Opoku et al. (2023), Rani et al. (2024) and Abubakar (2024) underscore the critical importance of refresher training and staff development in enhancing staff commitment to adopt new practices for improving overall performance. Additionally, the government of Tanzania publicly endorses the importance and necessity for continuous training and career development for all public servants as built on the Public Service Management and Employment Policy (PSMEP) of 1999, as was amended in 2008. Although, many institutions find it hard to keep organisational staff engaged due to challenges such as poor leadership, poor communication and few career development options (Pillay & Singh, 2018). Mansor et al. (2023) however, built that employee engagement remains very crucial for organization's success. Ngwasi (2022) perpetuates the recognition, importance and outcomes of training programs, however they don't always meet initial expectations. While there is a lot of research on training and development's impact on institution performance, there is still a big gap on engagement in nursing staff in Tanzania. Studies like Opoku et al. (2023) overlooked this important area, leading to a lack of understanding about how affects nurses' performance and commitment in public hospitals in Tanzania. This study focused on filling this gap by looking at how effective employee engagement impact on organisational performance at Muhimbili Orthopaedic Institute; specifically looking at the relationship between employee engagement on organisational performance.

1.2 Research Objectives

To examine the effects of employee engagement on organisational performance at Muhimbili Orthopaedic Institute (MOI).

1.3 Research Hypotheses

H_1: Employee engagement have a significant positive influence on organisational performance at Muhimbili Orthopaedic Institute (MOI).

II. LITERATURE REVIEW

2.1 Human Capital Theory

"Human Capital Theory" is a term in economics which regard people as the great companies' asset of production due to their knowledge, skills, abilities, and experience (Wirajing et al., 2023). The theory was postulated in the 1960s by Gary Becker and Theodore Schultz, who insisted on the necessity of investing in people's education, training and development to boost their effectiveness in organisational outcomes (Namawu, 2024). Human Capital Theory consider people as more productive when they are subjected into career development to acquire potential skills and knowledge through training, education, and job experience. In addition, the Human Capital Theory argue that companies invest in their employees for sustainability and competitiveness.

Human Capital Theory posits that employees are valuable assets whose knowledge, skills, and motivation contribute directly to organisational productivity and performance; therefore, organizations that foster strong employee engagement through involvement, recognition, and professional development can maximize returns on their human capital investment. Engaged employees are more committed, innovative, and willing to exert discretionary effort, which enhances efficiency, service quality, and overall competitiveness. Recent studies also highlight that engagement strengthens organisational resilience and adaptability by leveraging employees' tacit knowledge and collaborative capacities, thereby linking individual well-being to collective performance outcomes (Memon et al., 2023). From a Human Capital Theory perspective, engagement initiatives are not just motivational tools but strategic investments that

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enhance both the capacity and productivity of the workforce, ultimately improving organisational sustainability and long-term success.

2.2 Empirical Review

2.2.1 Effects of Employee Engagement on Organisational Performance.

Ouhammou and Manar (2024) investigated the workers' engagement at Alibaba Group and their influence on firm performance. The study indicated that Alibaba Group uses a positive work environment and inclusive culture, which promotes autonomous for employees and continuous learning and so leveling high employee engagement and job satisfaction. In a related study, Mansor et al. (2023) investigated the relationship between employee engagement and organisational performance. The study showed strong positive correlation between employee engagement and organisational performance.

In a related study, Gede and Huluka (2024) explored the effects of staff development practices on various dimensions of employee engagement, such as job satisfaction, organisational commitment, advocacy, pride, intention to stay, and emotional connection. The study showed strong positive correlation between staff development on these aspects of employee engagement. Additionally, Gede and Huluka (2024) assessed the influence of employee engagement on organisational performance within public universities in Ethiopia. Findings revealed that dedication, vigor and absorption strongly affect organisational performance in higher education. Mampuru et al. (2024) conducted a study in exploring the effects of staff development on job satisfaction, loyalty, and retention among academic employees. Findings through regression analysis indicated strong positive correlation between staff development programs and the levels of job satisfaction, loyalty, and retention among academic workers. Odunayo and Fagbemide's (2024), Abubakar's (2024), and Opoku et al.'s (2023) in their investigations they discovered some strong relationships between cultural/contextual characteristics, training efficacy, and overall organisational performance. Additionally, the quantitative results indicated significant gains in skills influenced job performance.

Yeboah et al. (2024) indicated that professional development programs sufficiently addressed operational challenges faced by workers upon their entry into Ghana Atomic Energy Commission (GAEC). Additionally, Msacky (2024) confirmed strong positive associations between employee retention, skills acquisition, knowledge acquisition, training opportunities, and training duration. In that regard, employee retention in health sectors under Local Government Authorities (LGAs) is high due to ongoing training and career development programs. This conclusion was in contrast to Kwon et al. (2024) who found that the employee development and engagement mutually influence one another; hence job performance is further strengthened relationship among employees, creating a positive cycle of improvement.

III. METHODOLOGY

3.1 Research Approach

The study employed a quantitative approach because it allowed the researcher to collect measurable data from a large number of nurses' staff, for establishing statistical relationships between engagement levels and performance outcomes. This approach enabled the use of structured tools such as questionnaires to generate objective and comparable data, which could then be analyzed using statistical techniques to determine the strength and significance of the relationship between variables.

3.2 Research Design

A case study research design was suitable for this study because it allowed for an in-depth exploration of complex, context-specific issues within a single institution. Muhimbili Orthopaedic Institute, being a specialized and unique health facility in Tanzania, provided an environment with rich quantitative data that could be collected to capture how employee engagement practices influence performance outcomes particularly in service delivery. Also, it was possible to triangulate data from multiple sources including documents, thereby offering understanding of the relationship between human resource practices and organisational performance.

3.3 Study Area and Target Population

The Muhimbili Orthopaedic Institute (MOI) was selected for the topic under study due to its reputation for focused services in orthopaedics and rehabilitation, as well as its diverse dedicated human resources. This diversity enhanced thorough assessment of various workers training and engagement initiatives and their effects on engagement levels. Muhimbili Orthopaedic Institute possesses a skilled team of 500 registered nurses centred in four departments: Orthopaedic and Traumatic Care, Neurosurgery (Brain and Spine), Clinical Support Services, and Nursing Services.

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3.4 Sample Size and Sampling Technique

A randomized sampling was employed across the nursing staff strata to achieve a sample size of 222 at Muhimbili Orthopaedic Institute Dar es Salaam Tanzania. The Yamane formula, $n = N / (1 + Ne^2)$, employed to guide the sampling through randomization to ensure a representative sample size. In this formula, 'n' stands for the calculated sample size, 'N' represents the total population of 500 nursing staff, and 'e' represent the margin of error which is set at 0.05 for a 95% confidence level.

$n = \frac{500}{1+500(0.05^2)}$, $n = 222$ nurses being selected from all four departments as indicated in Table 1.

Table 1

Sample Size Distribution (n= 222)

Sampling Procedure	**Categorical Strata**	**Size (n)**
Simple random	**Section/Department**	
	Orthopedic and Traumatic Care	55
	Neurosurgery (Brain and Spine)	55
	Clinical Support Services	55
	Nursing Services	55
	Nurses' supervisors	2
Total		**222**

A uniform distribution of 55 nurses per department was determined based on information provided by a nursing officer; each department has a no fixed number of nurses, nurses may move between departments depending on the tasks at hand (Nursing Officer, 2025).

3.5 Data Collection Methods

A questionnaire was suitable in data collection because it helped the researcher to gather standardized data from a large number of nurses' employees within a short time and at a relatively low cost. Further, it ensured anonymity, reduced interviewer bias and enabled the researcher to analyze responses systematically to establish relationships between engagement and performance.

3.6 Reliability and Validity

Cronbach's Alpha was employed in determining reliability because the study utilized the structured questionnaires with multiple items designed to measure variables such as nurses' engagement and organisational performance. Since these items were meant to capture the same underlying study constructs, it was necessary to test whether they were internally consistent and produced stable outcomes. Therefore, Cronbach's Alpha was used for reliability test for such Likert-scale survey instruments, to check the correlation as well as drawing reliable and valid conclusions. This enhanced the credibility of the findings by confirming that the measures of training and engagement consistently reflected their intended constructs. On the other hand, validity was achieved through the engaging the academic staff to use their expertise in training and engagement, to assess the items of the data collection instrument. Further, the piloting of the tools was administered on a selected area however was not involved in the actual sample.

3.7 Data Analysis Procedures

Data analysis was conducted using SPSS version 21. Quantitative data from the Likert scale questionnaire were coded, tabulated and systematically processed before undergoing detailed analysis. The Pearson correlation technique was employed to determine the strength and direction of the relationships among the study variables.

IV. FINDINGS & DISCUSSION

4.1 Employee Engagement

Effect of employee engagement on organisational performance was interrogated by five items: I feel engaged and motivated in my work environment, the organization has effective strategies to keep employees motivated and engaged, my opinions and suggestions are valued by management, employee engagement positively influences teamwork and collaboration in my department and there are significant factors that contribute to low employee engagement in this organization as presented in Table 2.

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Table 2

Pearson Correlation Matrix Showing the Relationship between Employee Engagement and Organisational Performance

Variables	Mean	SD	Cal.r	p-value
I feel engaged and motivated	8.99	3.716	-1	
Org keep workers motivated and engaged	8.93	3.736	.505	.000
My opinions and suggestions are valued	8.88	3.705	.397	.000
Engagement influences teamwork	8.88	3.771	.696	.000
Factors for low employee engagement	8.91	3.713	.686	.000

Correlation is significant at 01 level; df=188; 043

The results presented in Table 2 show that all p-values are .000, which are well below the 0.05 significance level at 188 degrees of freedom. A mean range of 8.88–8.99 reveals a positive attitudes of respondents highly expressed towards the factors measured, suggesting strong employee engagement and favourable perceptions of organisational performance. This provides robust statistical evidence supporting the alternative hypothesis that employee engagement is significantly correlated with organisational performance.

The R-values, ranging from .244** to .697**, indicate a moderate positive relationship between various aspects of employee engagement and overall organisational effectiveness. These aspects include employees' motivation and commitment in the workplace, the effectiveness of organisational strategies in sustaining engagement, the extent to which management values employee input, and the role of engagement in promoting teamwork and collaboration. Although the findings confirm that higher engagement levels are generally associated with improved performance outcomes, they also reveal underlying factors contributing to employee disengagement. This underscores the need to address structural and managerial barriers that undermine engagement initiatives. Similar conclusions were reached by Osei and Nyarko (2023), who observed that organisations adopting inclusive engagement practices and recognising employee contributions tend to achieve higher levels of productivity, innovation, and workforce retention.

This potential level of relationship underscores the critical role of employee engagement on organisational performance. The implication of this finding is that organizations seeking to improve efficiency, productivity, and overall success should prioritize strategies that foster employee engagement, as it is a key driver of organisational effectiveness. The finding was consistent with Ouhammou and Manar (2024) who found that practices enable high employee engagement increased job satisfaction and commitment.

Human capital theory posits that the skills, knowledge, and experience of employees significantly contribute to organisational performance (Mayilyan & Yedigaryan, 2022). In the context of the nurses' engagement on organisational performance at Muhimbili Orthopedic Institute, this theory demonstrates how engaged nursing staff enhance the quality of patient care, improve operational efficiency and foster a positive workplace culture. When nurses are actively involved in decision-making, continuous training, and professional development, they not only increase their own competencies but also lead to better health outcomes and higher patient satisfaction (Wirajing et al., 2023). This, in turn, boosts the organization's reputation, reduces turnover rates, and ultimately elevates overall performance (Namawu, 2024).

4.1.1 I Feeling Engaged and Motivated in my Work Environment

Findings imply that while the significant relationship between nurses' staff feelings of engagement and motivation at Muhimbili Orthopaedic Institute working area, however the correlation is weak (r = .244, p = .000). The statement suggests that despite the engagement level and motivation as related to some outcomes in the environment, other aspects are thought to greater influence on nurses' staff satisfaction. In that regard, some additional initiatives beyond engagement and motivation seem necessary to improve organisational performance. The findings showed that 53% of the respondent remained undecided; only 45% agree and strongly agree that they felt engaged and motivated in their work environment at Muhimbili Orthopaedic Institute. The findings therefore, suggest a significant opportunity for organisational improvement. This uncertainty indicates potential dissatisfaction and lack of clarity regarding workplace engagement initiatives, which could negatively impact nursing performance and patient care quality. Therefore, Muhimbili Orthopaedic Institute may need to implement targeted strategies to enhance communication, support and professional development, fostering a more motivating work environment (Ouhammou & Manar, 2024).

4.1.2 The Organization has Effective Strategies to Keep Employees Motivated and Engaged

Results imply that organisational initiatives directed at maintaining employee motivation and engagement provide crucial impact at Muhimbili Orthopaedic Institute health facility in Dar es Salaam. Correlation coefficient of (r = .505, p = .000) suggests that effective initiatives to improve motivation and engagement are closely linked to improved workers' commitment, attitudes and better performance. This finding indicates a moderate level of employee satisfaction

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with the current engagement initiatives. However, the fact that nearly half of the respondents do not fully agree highlights an opportunity for improvement. Therefore, Muhimbili Orthopaedic Institute can take this feedback to refine and enhance its motivational strategies, ensuring they are inclusive and impactful for all staff. Strengthening these initiatives could lead to higher employee morale, lower turnover rates, and improved organisational performance, ultimately benefiting patient care and creating a more positive work environment. This aligns with the perspective of fostering employee morale. Similarly, Ouhammou and Manar (2024) advocate for the development of a positive work environment and inclusive culture that encourages employee autonomy and continuous learning.

4.1.3 Opinions and Suggestions Valued by Management

Findings indicates that there is a statistically significant, however its weak, positive correlation between workers feeling that their suggestions and opinions are valued by management and the associated to the performance characteristics. The weak-to-moderate relationship (r = .297, p = .000) suggests that while valuing workers' positive contribution, it may not be the greatest aspect for overall outcomes. This suggests that many employees feel their voices are not being heard, this situation led to decreased motivation and job satisfaction. The high percentage of undecided respondents indicates uncertainty about the organization's commitment to fostering open communication and valuing employee input. Findings are contrary to Mansor et al. (2023) and Jain and Khurana (2017) strong positive correlation between staff development and employee engagement; strong positive correlation between employee engagement and organisational performance respectively. Hence, management at Muhimbili Orthopaedic Institute should consider implementing more robust feedback mechanisms and actively demonstrating that employee suggestions are taken seriously.

4.1.4 Employee Engagement Positively Influences Teamwork and Collaboration in my Department

The findings imply that departmental engagement at Muhimbili Orthopaedic Institute significantly influences teamwork and collaboration. The (r = .696, p = .000) imply strong and statistically significant positive correlation, which in turn suggests the higher levels of staff engagement are closely linked to improved cooperation and collaborative among team. A survey showed that 93% of employees agreed or strongly agreed with this. This high percentage means that most employees believe that being engaged at work improves how well they work together. Encouraging employee engagement could be an important way to boost teamwork and the overall performance of the department. The findings were in line with Kwon et al. (2024) found that employee development and engagement support each other, which improves job performance and strengthens relationships among employees, creating a positive cycle of improvement. This collaboration of employees shows a strong link between staff development and employee engagement (Jain & Khurana, 2017). Hence, a dedication, energy and focus greatly impact how well organizations perform in most (Gede & Huluka, 2024).

4.1.5 There are Significant Factors that Contribute to Low Employee Engagement in this Organization

The (r = .686, p = .000) findings shows a strong and statistically significant correlation between the determined factors and low employee engagement at Muhimbili Orthopaedic Institute. Findings suggests that the poor communication, lack of support, insufficient recognition among employees diminishing staff engagement levels. According to Gede and Huluka, (2024) low employee engagement in an organization is attributed to several factors, including inadequate communication between management and staff, lack of recognition and appreciation for employees' contributions, limited opportunities for professional development and career advancement, and a disconnect between employees' values and the organization's mission. Additionally, a negative workplace culture, characterized by high levels of stress, poor work-life balance, and insufficient support from leadership, can further diminish employee morale and commitment as emphasized by Ouhammou and Manar (2024). Mampuru et al. (2024) insist that staff development programs and the levels of job satisfaction, loyalty and retention among academic workers improve mental stability and reduces turnover.

4.2 Organizational Performance

The findings on the organisational performance of MOI highlighted indicators such as: training and development contributing to the overall success of the organisation; employee engagement having a direct impact on organisational productivity and efficiency; employees feeling more engaged when their suggestions, opinions, and advice are valued by management; the organisation effectively aligning training, skills development, and employee engagement to enhance performance; and the provision of relevant resources to enable employees to apply newly acquired knowledge and skills in achieving organisational goals, as illustrated in Table 3**.**

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Table 3

Pearson Correlation Matrix Showing Organizational Performance

Variables	Mean	SD	Cal.r	p-value
T&D contribute to org success	8.99	3.716	1	
Org keep workers motivated and engaged	8.93	3.736	.504	.000
My opinions and suggestions are valued	8.88	3.705	.601	.000
Org. align training with staff engagement	8.88	3.771	.696	.000
Resources are given to use obtained skills	8.91	3.713	.686	.000

Correlation is significant at 01 level; df=188; 043

The findings presented in Table 3, demonstrate that all p-values (.000) fall well below the 0.05 significance threshold at 188 degrees of freedom, thereby providing strong statistical support for the alternative hypothesis that employee engagement and organisational performance are significantly correlated. The mean range of 8.88–8.99 indicates that respondents expressed highly positive attitudes towards the variables under investigation, reflecting strong levels of employee engagement and favourable perceptions of organisational performance. Furthermore, the Pearson correlation coefficients, ranging from .505** to 1.000**, indicate a moderate to strong positive association between key dimensions of employee engagement and organisational success. In particular, the findings suggest that training and development initiatives play a pivotal role in enhancing overall organisational performance.

Furthermore, employee motivation and engagement are strongly influenced by the organisation's capacity to value employee input, foster collaborative teamwork, and implement mechanisms to address disengagement. Employees report higher levels of engagement when their opinions and suggestions are acknowledged by management, and when they receive adequate support and resources to apply newly acquired knowledge and skills in pursuit of organisational objectives. These findings are consistent with the recent work of (Abubakar, 2024; Pinto et al., 2020), who contend that aligning employee engagement strategies with training and performance goals not only enhances productivity but also cultivates a culture of continuous improvement and innovation within organisations.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The findings indicated a strong positive consensus among respondents on the effectiveness of the interventions, highlighting the significant role of training and engagement in enhancing organisational performance. Employee engagement emerged as a critical factor influencing improved outcomes. Grounded in Human Capital Theory which emphasizes employees' knowledge, skills, and competencies as vital organisational assets the results suggest that strategic investments in training and engagement substantially strengthen organisational capacity. At Muhimbili Orthopaedic Institute, training initiatives focused on clinical skills development, patient management, and administrative efficiency are perceived to directly improve healthcare delivery, minimize patient wait times, and enhance the overall quality of services offered.

5.2 Recommendations

Muhimbili Orthopaedic Institute was argued to establish clear key performance indicators (KPIs) linked to training outcomes involving patient satisfaction, staff productivity and surgical success rates linked with engagement initiatives with organisational performance. The Ministry of Health in Tanzania and Muhimbili Orthopaedic Institute management should ensure sustainable availability of funds for staff training and engagement programs annually. Develop a National Health Workforce Engagement Policy which will promote employee involvement, recognition and well-being across all public health institutions using Muhimbili Orthopaedic Institute as a case study for implementation.

REFERENCES

Abubakar, A. H. (2024). Evaluating the impact of training and skill development programs on employee performance in banking sector/financial institutions. *Global Journal of Human Resource Management, 12*(1), 1–10.

Achackzai, N. (2024). The impact of training on employee's performance. *Research Papers in Education, 11,* 2349–5219.

Adeyemi, T., & Yusuf, A. (2023). Employee training and organisational performance in Nigerian SMEs. *Journal of African Business, 24*(1), 45–61.

Arulsamy, A. S., Singh, I., Kumar, M. S., Panchal, J. J., & Bajaj, K. K. (2024). Employee training and development enhancing employee performance: A study. *Samdarshi, 16*(3). https://www.researchgate.net/publication/373775939

Licensed Under Creative Commons Attribution (CC BY-NC)

El-Sayed, M., & Hassan, R. (2024). Training and employee engagement effects on Egyptian organisational competitiveness. *Middle East Journal of Management, 11*(2), 102–118.

Gede, D. U., & Huluka, A. T. (2024). Effects of employee engagement on organisational performance: Case of public universities in Ethiopia. *Future Business Journal, 10*, Article 32.

Jain, S., & Khurana, N. (2017). Enhancing employee engagement through training and development. *Asian Journal of Management, 8*(1), 1–6. https://doi.org/10.5958/2321-5763.2017.00001.4

Johnson, M., Lee, R., & Thompson, A. (2022). Employee engagement and organisational effectiveness in UK firms: A longitudinal study. *Journal of Business Research, 135*, 45–56.

Kariuki, J. M. (2023). Employee engagement practices and organization performance of African Economic Research Consortium in Kenya (Master's thesis, Kenyatta University). Kenyatta University Institutional Repository. https://ir-library.ku.ac.ke/handle/123456789/26758

Kim, H., & Park, J. (2022). Workforce management in North Korean enterprises: Ideological training and productivity. *Asian Journal of Political Economy, 18*(4), 310–325.

Kwon, K., Jeong, S., Park, J., & Yoon, S. (2024). Employee development and employee engagement: A review and integrated model. *Career Development International, 29*(3), 314–333. https://doi.org/10.1108/CDI-04-2023-0117

Li, X., & Wang, Y. (2023). The role of employee training in China's manufacturing sector: A government-driven approach. *International Journal of Human Resource Management, 34*(2), 220–238.

Mampuru, M. P., Mokoena, B. A., & Isabirye, A. K. (2024). Training and development impact on job satisfaction, loyalty and retention among academics. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur, 22*(0), a2420.

Mansor, F. A., Mat Jusoh, Y. H., Hashim, M. Z., Muhammad, N., & Omar, S. N. Z. (2023). Employee engagement and organisational performance. *International Journal of Accounting, Finance and Business, 8*(50), 69–80. https://doi.org/10.55573/IJAFB.085006

Mayilyan, F., & Yedigaryan, K. (2022). The evolution of human capital theory. *Alternative, 4*(4), 68–79. https://doi.org/10.55528/18292828-2022.4-68

Mdhlalose, D. (2020). An evaluation of the impact of training and development on organisational performance: A case study of the Gauteng Provincial Department of Economic Development. *Journal of Human Resource and Sustainability Studies, 8*, 48–74. https://doi.org/10.4236/jhrss.2020.81004

Mehale, K. D., Govender, C. M., & Mabaso, C. M. (2021). Maximizing training evaluation for employee performance improvement. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur, 19*(0), Article a1473. https://doi.org/10.4102/sajhrm.v19i0.1473

Memon, R. A., Bai, R., Simran, F., Kumari, M., Aisha, F., Kiran, S., Kakarlapudi, Y., & Saleem, F. (2023, January 24). Effect of the polypill on adherence and prevention of cardiovascular diseases in patients with or at high risk of cardiovascular diseases: A meta-analysis of randomized controlled trials. *Cureus, 15*(1), e34134. https://doi.org/10.7759/cureus.34134

Mensah, E. K., & Boateng, F. (2023). Linking training outcomes to organisational performance: The mediating role of skill application and managerial support. *International Journal of Human Resource Development, 19*(1), 45–62.

Mosha, M., et al. (2022). Impact of training and employee engagement on healthcare performance in Tanzania. *African Journal of Health Sciences, 35*(4), 123–135.

Msacky, R. (2024). Retention of human resources for health in the decentralised health system in Tanzania: Does training matter? *Journal of Policy and Development Studies, 16*(1), 74–91. https://doi.org/10.4314/jpds.v16i1.5

Muller, R. (2018). The impact of employee engagement on organisational performance: A balanced scorecard approach. *International Journal of Economics and Finance, 10*(2), 45–58. https://sobiad.org/eJOURNALS/journal_IJEF/archieves/IJEF_2018_2/r-muller.pdf

Mwamakula, G. H. (2024). Effect of training and development on Social Security Funds employee's performance (Master's thesis, The Open University of Tanzania). https://repository.out.ac.tz/3879/

Namawu, A. (2024). Human resource management practices and staff work performance: The case of Sagnarigu Municipality in the Northern Region, Ghana (Master's thesis, University of Education, Winneba). http://ir.uew.edu.gh

Ngwasi, G. J. (2022). Examining the role of off-the-job training on employee performance in local government authorities: A case of Singida Municipal Council (Master's dissertation, Institute of Accountancy Arusha).

Nkosi, L., & Mbatha, Z. (2024). Strategic training and workforce effectiveness in South African corporations. *South African Journal of Business Management, 55*(1), 30–45.

Odanwu, A., & Uchenna, A. (2024). The impact of career development on employee performance in the civil service sector: A Nigerian context. *16*, 42–63. https://doi.org/10.47297/wspchrmWSP2040-800504.20241501

Licensed Under Creative Commons Attribution (CC BY-NC)

Odunayo, H., & Fagbemide, O. (2024). Workplace training and employee effectiveness: A case study of Nigerian banking industry. *Acta Universitatis Danubius. Œconomica, 20*(1), 88–106. https://www.dj.univ-danubius.ro/index.php/AUDOE/article/view/2663

Opoku, F. K., Narcotey, I., Kwao, I. T., & Antwi, B. O. (2023). Impact of training and development on job performance in higher education: The case of security guards in the University of Cape Coast, Ghana. *Journal of Business and Enterprise Development*, *11*(1), 1–15. https://doi.org/10.47963/jobed.v11i.1211

Osei, P., & Nyarko, J. (2023). Employee engagement and organisational performance: A strategic perspective in the post-pandemic workplace. *Journal of Organisational Psychology and Management, 17*(3), 112–130.

Ouhammou, S., & Manar, O. (2024). The impact of employee engagement on organisational performance: Case of Alibaba Group. *International Journal of Research and Innovation in Social Science*, *8*(12), 1476.

Pillay, E., & Singh, S. (2018). The impact of employee engagement on organisational performance – A case of an insurance brokerage company in Gauteng. *Journal of Business and Management, 20*(6), 66–76.

Pinto, L., Nunes, E., & Sousa, S. (2020). A framework to improve training and development of workers' technical skills: Effects on operational performance during company relocation. *Procedia Manufacturing, 51*, 1806–1813.

Rani, S., Jining, D., Shoukat, K., Shoukat, M. U., & Nawaz, S. A. (2024). A human–machine interaction mechanism: Additive manufacturing for Industry 5.0 design and management. *Sustainability*, *16*(10), 4158. https://doi.org/10.3390/su16104158

Sanga, F. K. (2024). Effect of training and development on employee performance (Master's thesis, The Open University of Tanzania). https://repository.out.ac.tz/3956/

Smith, J., & Brown, K. (2023). Impact of employee development programs on innovation in US tech companies. *Human Resource Development Quarterly, 34*(1), 77–92.

Wirajing, M. A. K., Nchofoung, T. N., & Etape, F. M. (2023). Revisiting the human capital economic growth nexus in Africa. *SN Business & Economics*, *3*, Article 115.

World Health Organization. (2023). *Tanzania health system review: Improving workforce performance and engagement.* WHO Publications.

Yeboah, R., Agyen-Sampong, M., Nyarko, J. M., & Dekpeh, E. A. (2024). Effects of professional development on productivity: Evidence from a research institution in Ghana. *Open Journal of Social Sciences, 12*, 458–477.

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Psychosocial support services for youth and adults affected by the landslide disaster in Katesh, Hanang District, Tanzania

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ABSTRACT

The landslide disaster in Katesh, Hanang District, Tanzania, had diverse effects on the psychosocial wellbeing of the affected populations. There were efforts and initiatives targeted to address its effects. However, the psychosocial-related problems affected the lives of individuals in communities. This study examines psychosocial support services provided to youth and adults following a landslide disaster in Katesh, Hanang District. The Social Support Theory guided the study. The study employed a qualitative approach with a descriptive phenomenological design. The target population was the youth and adults aged 15 years and above affected by the landslide disaster in Katesh Ward. Thirty-eight (38) informants were involved in the study. Non-probability sampling techniques, including convenience sampling and snowball sampling techniques, were used to select respondents. In-depth interviews and focus group discussions were used to collect primary data and a review of various documents to collect secondary data from both written and electronic materials. Thematic analysis was used to analyse data. The major findings show that the psychosocial support services that were provided included social support services, such as physical and material support, family and community support, medication and referrals. Also, psychological support services included psychological counselling, emotional support and encouragement. The psychosocial support services were provided timely in a well-coordinated system. The findings also highlighted the challenges encountered in the provision of psychosocial support services, including inadequate financial resources and human resources. The study recommends the strengthening of the capacity of local communities through training and skills development in disaster management and ensuring continuity and sustainability in the provision of psychosocial support services, including psychological counselling services.

Keywords: Psychological Counselling, Psychosocial Support, Psychological Wellbeing, Tanzania, Youth and Adults

I. INTRODUCTION

Disaster affect livelihoods, destroy infrastructure, and causes health problems. It has diverse effects on psychosocial wellbeing of the affected populations (Tol, et. al., 2023). Psychosocial related problems include family separation after disaster, disruption of social networks and community structures and support mechanisms (Bangpan, et. al., 2019). The provision of psychosocial support involves counselling and therapy services. On the other hand, social support involves community building activities or connecting individuals with social networks (World Health Organisation, 2023). Psychosocial support services help in the recovery process and in the prevention of problems that may be encountered in the community. It involves activities that increase resilience and coping of the youth, adults and other affected individuals. The services, which are provided to the affected individuals include basic needs and information supply, health care, psychological support, and social support (El Barazi, 2023).Therefore, psychosocial support services improves emotional resilience, reduces stress and encourages community support networks during the recovery process from disaster (Awadhalla & Qaroon, 2018).

The Sendai Framework for Disaster Risk Reduction of 2015-2030 aimed at preventing and reducing losses in lives, livelihoods, economies and infrastructure. Thus, framework calls for raising awareness for resilient future (United Nations Disasters Risk Reduction (2023). In addition, sustainable development goals emphasize the promotion of wellbeing and health lives (World Health Organisation, 2018). Likewise, the Sustainable Development Goal 3 aims to ensure healthy lives and promotion of wellbeing for all ages. It targets on risk reduction and management of national and global health risks (United Nations, 2019; Siragusa et. al., 2022).

The national Disaster Management Strategy aims to ensure the provision of psychosocial and mental health, and rehabilitation services for all people in need during emergency and recovery process. Hence, disaster prevention, mitigation and preparedness aim to enhance disaster prevention at all levels for community resilience (United Republic of Tanzania, 2022a). Moreover, the national guidelines for the provision of psychosocial care and support services targets to ensure the provision of standardized and quality psychosocial care and support services that are

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responsive to all key and vulnerable populations for their full psychological and social well - being. Thus, one of its objectives is to strengthen the coordination for the provision of quality psychosocial care and support services (United Republic of Tanzania, 2020). This study therefore aimed to assess psychosocial support services provided to the youth and adults affected by landslide disaster. Psychosocial support in this study refers to the process and actions that promote the holistic wellbeing of people in their social life.

Disasters have serious psychosocial effects on the affected population. They create significant disturbance to the lives of a large number of people. There have been efforts and strategies to ensure the preparedness for disasters and the provision for psychosocial support services among the affected communities in Tanzania (United Republic of Tanzania, 2020; United Republic of Tanzania, 2022a). However, the effects of disaster results in a state of denial due to the loss and vulnerability of the victims due to the feeling of insecurity attributed by the loss of asserts, property and destruction of homes (Kohtz, et. al., 2018). In addition, death of family members and relatives lead to insecurity due to the loss of a sense of belonging, love and attachment.

This study assessed psychosocial support services, which are provided for psychological wellbeing of affected individuals. The study findings provide insights on psychosocial support services provided to affected youth and adults. Thus, the study contributes to ensuring that knowledge on psychosocial support services and psychological well-being among youth and adults in the affected communities is disseminated to all stakeholders for galvanising informed decisions. The study findings would help to inform and influence policy related to psychosocial support and psychological wellbeing. The study informs policy makers in education and health sectors on the provision of psychosocial support to the affected communities. This study therefore, sought to contribute to theoretical and practical knowledge on psychosocial support services for psychological wellbeing among youth and adults population.

1.1 Statement of the Problem

Provision of psychosocial support services to individuals and families affected by disasters is of paramount importance. Psychosocial support involves easing psychological, social and physical difficulties for individuals, families and communities. It targets to enhance wellbeing and ensure recovery and adjustment after lives disruptions (Brooks, et. al., 2018). Psychosocial support activities include counselling on psychological and social problems attributed by traumatic life experiences and social support such as provision of material and physical support, and health care services including treatment and referrals (Awadhalla & Qarooni, 2018). Psychosocial support services are targeted to support families and victims to address their emotional, social, physical, and health needs. It therefore, involves promotion of a sense of safety and ensures a hopeful future after experiencing negative feeling and perceptions (United Republic of Tanzania, 2020).

However, availability and access to psychosocial support services is still low in LMIC (Low and Medium Income Countries) including Tanzania. Despite efforts done in provision of psychosocial support services there are challenges in access to psychosocial support services to victims of disasters. Evidence suggests that the needs for psychosocial support services, exceeds the capacity for social services and health care systems in LMIC (Deimling, et. al., 2018, Leon-Himmelstine, et. al., 2021). The current body of literature do not adequately address provision of psychosocial support services and the challenges encountered in the recent land slide floods disaster encountered by teenagers and adults in Hanang. Psychosocial support services and resources are still limited in community (Leon-Himmelstine, et. al., 2021). Therefore, this study presents significant contributions in disaster risk reduction by examining the psychosocial support services and the challenges associated to its provision.

1.2 Research Objectives

i. To identify psychosocial support services provided among youth and adults impacted by landslide disaster.
ii. To determine challenges encountered in the provision of psychosocial support services.

1.3 Research Questions

i. What psychosocial support services were provided to youth and adults following landslide disaster?
ii. What challenges were encountered in the provision of psychosocial support services?

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Social Support Theory

This research study was guided by Social Support Theory, which was propounded in the mid-1970 and early 1980's. The theory explains the importance of provision of information, instrumental, appraisal and emotional support when one is in need or stress (Murphy, 2024). Thus, social integration facilitates access to different forms of social support from various sources including family members, friends, colleagues and community resources. The theory proposes that social relationships and support networks are important in individual's well-being. Thus, access to

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supportive relationships such as emotional support, information guidance, tangible assistance and a sense of belonging has a positive impact on an individual's physical and mental health (Murphy, 2024).

According to the theory, social support can have significant impact on individual's wellbeing, coping strategies and health outcomes. It ensures resilience through self-esteem, a sense of belonging and control of individual's circumstances and challenges encountered. Thus access to supportive relationships helps to address negative effects and stressful experiences (Murphy, 2024). This study used Social Support theory to examine psychological wellbeing and psychosocial support services provided to the youth and adults affected by land slide disaster.

2.2 Empirical Review

2.2.1 Psychosocial Support Services Provided Among Youth and Adults Impacted by Landslide Disaster

Empirical research continually demonstrates that psychosocial support is an essential element of disaster management, especially for teenagers and adults susceptible to psychological and social suffering after occurrences like landslides. Psychosocial support, as articulated by the United Nations Relief and Works Agency (2016), include initiatives designed to improve the comprehensive welfare of individuals within their social contexts, particularly by fostering resilience and assisting individuals in managing various stresses. The Inter-Agency Standing Committee (2007) specifies that psychosocial support encompasses both environmental and emotional dimensions, assisting impacted populations in coping with mental health issues and social disturbances.

In crisis scenarios, psychosocial support services typically categorise into three primary types. The initial component is fundamental psychosocial assistance, which entails enhancing awareness and fostering coping mechanisms within the society. This include group talks, community meetings, and general emotional support, all aimed at cultivating resilience on a wide scale. The second group encompasses peer support and community-based solutions, wherein individuals impacted by disaster—both kids and adults—are motivated to exchange their experiences and derive insights from one another. This method is especially beneficial in communities impacted by disasters, as it utilises social networks to offer emotional support and pragmatic guidance (IASC, 2007). The third category of treatment is personalised psychological care, encompassing individual counselling and group therapy sessions aimed at individuals undergoing significant psychological suffering. These interventions often encompass professional evaluation, therapy formulation, and subsequent care to guarantee enduring healing. The provision of psychosocial support services in catastrophe contexts typically entails a cooperative endeavour among several stakeholders.

The World Health Organisation (2023) emphasises the significance of multi-sectorial engagement, acknowledging the contributions of governmental bodies, non-governmental organisations (NGOs), and community leaders. In Tanzania, psychosocial support services post-disasters are coordinated across multiple administrative tiers, from national ministries to local government authorities; with Council Health Management Teams (CHMTs) supervising implementation at the community level (United Republic of Tanzania, 2020). Non-governmental organisations often engage in delivering direct services, including counselling, mental health education, and the capacity building of local service providers, which is essential for both rapid and sustained rehabilitation (Andersen et al., 2022).

2.2.2 Challenges Encountered in the Provision of Psychosocial Support Services

Although the need of psychosocial support in disaster response is acknowledged, empirical research reveals numerous on-going obstacles that impede successful service delivery. A principal difficulty pertains to the coordination among the diverse stakeholders engaged in providing psychosocial support. Dickson and Bangpan (2018) observe that coordination difficulties may arise from divergent organisational missions, individual attitudes, and disparate degrees of comprehension of mental health and psychosocial support. Insufficient coordination may lead to resource depletion, effort redundancy, and inconsistent service provision, ultimately diminishing the efficacy of treatments. Duruel (2023) emphasises that inadequate coordination frequently results in delays in support delivery and deficiencies in essential services, especially for at-risk populations such as kids and adults.

Communication obstacles represent a considerable issue in catastrophe contexts. Becker et al. (2019) underscore the need of prompt and precise information dissemination between impacted communities and assistance teams. Inadequate communication might render individuals oblivious to available resources, while postponed or erroneous information may undermine trust and obstruct community engagement in recovery initiatives. Literature indicates that informal community meetings and feedback systems may effectively address these concerns; however, their implementation frequently lacks consistency.

An additional problem noted in the literature is the transient character of several psychosocial support programs. Duruel (2023) and Dukiya and Benjamine (2021) contend that although prompt assistance from external specialists and agencies is beneficial, it frequently falls short in meeting long-term psychosocial requirements. Affected persons, especially those who have undergone significant trauma, necessitate continuous counselling and

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subsequent treatment to attain psychological healing. The absence of continuous care may result in unaddressed long-term needs and hinder the healing process.

Resource limitations significantly hinder successful service delivery. Safapour et al. (2021) and Puri et al. (2024) indicate that financing for psychosocial assistance is often temporary, generally allocated for under a year, so constraining the capacity to implement thorough and enduring interventions. Alongside budgetary constraints, there frequently exist deficits in trained staff, supplies, and other essential resources, especially in low-resource environments. These limits can impede service continuity and leave impacted populations without sufficient support, particularly as the acute phase of disaster response shifts to prolonged recovery.

III. METHODOLOGY

3.1 The Study area

This study was conducted in Katesh Ward in Hanang District in Manyara region. According to (Tanzania Meteorological Authority, 2023), landslides disaster is the most recent tragedy that hit Manyara region and Hanang District in particular. People were injured, and more than 65 people died and scores of houses and infrastructure were destroyed (Tanzania Meteorological Authority [TMA], 2023). The population in Hanang District is 367, 391; among these, 188,063 are males and 179,328 are females. The district has 69,710 households, with an average household size of 5.3 (United Republic of Tanzania, 2022b). Moreover, the population in Katesh Ward is 13,084; among these 6,332 are males and 6,752 are females. The average household size is 3.7 (United Republic of Tanzania, 2022b). Hanang District was purposively selected in this study because of the landslides disaster which was experienced in the area.

3.2 Design of the Study, Population and Target Population

The study employed a qualitative research approach with a descriptive phenomenological design to investigate respondents' experiences on psychosocial support services provided to youth and adults affected by land slide disaster. This design was employed in this study because it allowed for exploration and collection of detailed descriptive information about participants experiences and contexts. Phenomenological design help in giving descriptions of experiences about the phenomenon and individuals experiencing it (Liamputtong, 2020). The population for this study was all individuals affected by land slide disaster in Katesh ward. The targeted population was youth and adults aged 15 years and above from the families affected by the disaster and social workers involved in the provision of psychosocial support services to affected individuals in Katesh Ward. Social workers assessed needs, provided psychological, social, physical and material support. Thirty two (32) youth and adults and six (06) social workers participated in the study. Inclusion criteria required being 15 years and above affected by land slide disaster and being a social worker.

3.4 Sample Size and Sampling Procedures

The study sample of 38 respondents was selected from the targeted population. Non probability sampling techniques including convenience sampling and snow ball sampling techniques were used to select respondents. Convenience sampling was used to select respondents based their accessibility and willingness to participate in the study. Then snowball sampling technique was used to refer participants affected by the disaster and with common experiences and characteristics. Through this technique, 16 youth and 16 adults who were affected by the land slide disaster and 6 social workers who assisted in the disaster were selected to participate in the study. Participant consent, anonymity and privacy of data were sought before participation in the study.

3.5 Methods of Data Collection

Different methods were used to collect data from the respondents. First, thirty two (32) in-depth interviews were conducted with youth and adults in the affected families. Also six in-depth interviews were conducted with social workers. This method helped to obtain valid and relevant information on disaster experiences and psychosocial support services provided to youth and adults. Second, two Focused Group Discussion were conducted, one with youth and adults respectively. The semi- structured interview guide was used based on the study objectives. Interviews and discussions were conducted in Kiswahili language and then they were later translated in English to ensure clear understanding of the questions. Informed consent was sought before data collection. The interviews and FDGs took place in September 2024. Data collection was stopped when further data collection did not result in new ideas (Saunders et. al., 2018). Third, various documents from both written and electronic materials such as policy documents and Government publications were reviewed. This method provided useful and relevant information.

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3.6 Data Analysis

In-depth interview and FDGs data were transcribed and summarized according to key themes based on the objectives of the study. Data were coded from keywords obtained from interview extracts from face to face interview, FDGs and audio recorded interview. Audio recorded interview helped to capture the context of the information provided. Themes were identified and analysed thematically focusing on the content. Thematic analysis involved six phases; familiarization with the data, generating codes, searching for themes, reviewing themes, defining and naming themes, and creating a narrative using extracts from the interview with passages that show the analytic narrative. Thematic analysis was done to identify patterns from the data and to derive themes. Meaningful segments of the data were assigned codes. Then themes were generated according to the data codes (Braun & Clarke, 2006; O'Brien et. al., 2014).

IV. FINDINGS & DISCUSSION

4.1 Findings

This section presents the study findings, which were categorized into two key themes based on the study objectives. The key themes include psychological support services provided to youth and adults, social support services provided to youth and adults and the challenges encountered in the provision of psychosocial support services. The findings were highlighted further into four sub themes; psychological support services, Social support services, inadequate financial resources, inadequate human resource.

4.1.1 Psychosocial Support Services Provided to Youth and Adults

The study examined psychosocial support services provided to youth and adults for psychological wellbeing following the landslide disaster. Table 1 presents results for psychosocial support services which were provided to youth and adults.

Table 1

Results for Psychosocial Support Services Provided to Youth and Adults

Data Items	Codes	Category	Sub themes	Theme
I received counselling services. We were encouraged, and given emotional support.	Provision of Psychological support	Psychological counselling Emotional support	Provision of counselling Services	Psychological support services provided to youth and adults
We were given food, mattresses, and blankets	Provision of basic needs	Physical and material Support	Provision of social support	Social support services provided to youth and adults
We were given shelter and houses were built for us. This gave us relief.	Provision of humanitarian support	Community support	Provision of social support	
Different individuals supported us	Psychosocial Support	Social workers, counsellors support	Provision of psychosocial support	
Individuals who were wounded were taken to hospital	Medication and referral	Health care facilities	Provision of health care facilities	

According to respondents, different support services provided to youth and adults affected by disaster are categorised into psychological and social support services.

Psychological Support Services: The findings showed that individual counselling services were provided to youth and adults. Also mental health services and psychotherapy were provided by social workers and medical officers to support individuals who experienced serious mental health problem. A male respondent aged 45 years had this to say:

> *I lost my belongings, and my house. It was a very difficult experience. I received different support including food, and counselling services. I think it is not easy for me to forget this bad tragedy* (11 September, 2024).

These findings show that victims experienced painful psychological distress. In addition, they appeared very hopeless. The finding show further that counselling services and referrals were provided by social workers, psychologists and medical professionals to individuals who required more assistance and medication.

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> *I received counselling services. I am fine but I am still worried when I remember what happened. Others were taken to hospital and some of them were injured seriously* (11 September, 2024).

The findings show further that during disaster, individuals experience stressors that cause emotional disruptions, hopelessness and helplessness. Hence, emotional support was provided to such individuals. According to scholars, participation of groups of individuals in the provision of psychosocial support services encourage the victims psychologically as they feel safe and empowered (Duruel, 2023; Kuckarslan, et.al, 2025).

Social Support Services: Social support involved psychosocial and material resources provided in order to help individuals to address or cope with the social problem they encountered. The study findings show that various stakeholders including social workers, health care workers, and community members (friends, family, and neighbours) participated in the provision of social support. The finding obtained through interview with respondents showed that psychosocial support services were provided immediately after the disaster. A social worker aged 38 years reported;

> *The provision of support services started immediately…. the government through its organs coordinated and collaborated with different organizations to rescue and provide services and supplies to victims. Information on the disaster and feedbacks were provided to community members, rescue teams and different stakeholders. Individuals who were injured were taken to hospital* (12 September, 2024).

The findings show further that coordination system was effective and well managed by the government through its systems from ministerial to ward levels, where the services were provided to the victims. The respondents reported further that new houses were built by the government for those individuals whose houses were destroyed by land slide. A male youth aged 16 reported;

> *Apart from daily services rendered to us, the government built good houses for us. This really gave us relief. We have the place to live even though we have lost all of our belongings* (11 September, 2024).

The findings showed that respondents experienced difficulties after their houses and personal belongings were destroyed by landslides and floods. A female respondent aged 29 also reported;

> *I had a house in this area. All of my belongings were destroyed during land slide floods. I was so confused. I thank God that I was assisted and managed to get out of the house safely…..We were given mattresses, blankets, food and a temporary shelter.* (11 September, 2024)

The findings suggest that rescue teams were active and immediate support was provided.

4.1.2 Challenges Encountered in the Provision of Psychosocial Support Services

The second research question sought to examine the challenges encountered in the provision of psychosocial support services. The findings show that the most commonly reported challenges include inadequate financial resources, and inadequate human resource. The findings suggest that the reported challenges contribute in limiting distribution, accessibility of services and continuity of support services. Table 2 presents the details.

Table 2

Results for Challenges in Provision of Psychosocial Support Services

Data Items	Code	Category	Sub Themes	Themes
We have not received start up fund or compensations	Challenges in provision of social support services	Financial resources	Inadequate financial resources	Challenges encountered in provision of psychosocial support services
Experts were not enough to counsel all individuals	Challenges in provision of psychological services	Human resources	Inadequate human resources	

Inadequate Financial Resources: The findings show that there were limited financial resources to address economic challenges resulting from the disaster effects. It was reported that business activities that helped individuals to earn a living were seriously affected. Furthermore, it was difficult to get start-up funds for recovering destroyed livelihood activities including petty business activities and agricultural activities. A male respondent aged 28 years had this to say:

> *I had my petty business in the market place, but I lost everything. Nothing remained there; it just remained an empty space. Everything was destroyed and swept away by the land slide. Also we had not received any start-up money for our businesses or any compensation* (11 September, 2024).

The findings show that individuals who encountered serious loss were worried and desperate. Moreover, it was noted that the victims were optimistic for compensations to cover for the loss they encountered.

Inadequate Human Resources: The respondents reported that there were inadequate counsellors to provide psychological services. For example, the provision of individual guidance and counselling with the subsequent follow up were reported to be inconsistent due to limited number of counsellors and psychologists in the area. A female respondent aged 35 years reported:

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> *The counsellors are not enough to attend and provide counselling to all clients…. I experienced difficulties and I was worried about my future. I did not get enough counselling support* (12 September, 2024).

According to the findings, human resource was insufficient to meet all the needs of the community. Thus, the inadequacy of psychological related services was attributed to inadequate number of counsellors and experts. This limits effective provision of psychosocial support services.

4.2 Discussion

This section presents the discussion of study findings based on the study objectives.

4.2.1 Psychosocial Support Services Provided to Youth and Adults

The study findings suggest that counselling services were provided and helped to address emotions, worries and the feeling of desperation among the people. However, the services appeared to be limited particularly for cases that could require subsequent follow up visits. Scholars argue that psychological support involved listening to individuals, comforting them and to ensure that they are assisted. It also involves empathy, respect and care to clients. Furthermore, psychological support services aimed to help individuals to address distress and post disaster challenges (Semerci & Uzun, 2023; Taylor & McAvoy, 2025). The findings highlights further that psychosocial support focused on the dynamic interaction between emotional process and social structures that link the individuals' internal experience including emotions, behaviour and thoughts with external reality of community support systems (Bretton, 2024; Taylor & McAvoy, 2025). Hence, the provision of psychosocial support during the aftermath of a disaster helps to ensure that trust is restored and feelings of isolation are addressed (Milosevic et. al., 2024; Bretton, 2024).

The findings show that the support activities involved the provision of immediate social support such as emergency shelter facilities, food, and water supplies. It was reported that the government at different levels that is, the national, regional, district and ward levels played a key role in handling the matter. Hence, good coordination ensured a systematic coordination of activities from the ministerial, regional, district and ward levels. Good coordination was also reported from the international agencies, private sector and the local community.

The findings also show that humanitarian support was provided according to the severity of situation, which was encountered by the victims so as to meet their needs. This has implications on individuals' life and their wellbeing. Scholars argue that disaster lead to destruction of homes, damage of infrastructure and separation of family (Djordjevic & Gacic, 2024; Kaur, 2020). Therefore, the provision of psychosocial support intends to help the victims of disaster to stabilize their emotions (Bretton, 2024; Taylor & McAvoy, 2025).

4.2.2 Challenges Encountered in the Provision of Psychosocial Support Services

The findings highlighted the challenges, which were encountered in the provision of social support services. The findings suggest that the economic situation of the people was negatively affected due to losses of property, livelihood and earning capacity. Thus, the victims of disaster sought to find compensation in terms of financial and material support to compensate material losses. Scholars argue that financial instability tend to interrupt service delivery due to the lack of funds (Brooks et. al., 2017). The findings show further that counselling services were not adequate and sustainable due to limited number of counsellors of providing such services. However, scholars argue that community support and focused care are important in improving psychological and mental health outcomes among affected individuals (Bangpan, et. al., 2019).

Furthermore, informal support of the family and communication between the victims and family members ensured encouragement and support. Hence, despite the limited number of counsellors, family connection during the disaster helps to ensure effective coping with the stress (Duruel, 2023). Moreover, ensuring capacity building of local teams and training of social workers is important in building resilience and sharing of responsibility in disaster management and ensure prompt assistance to victims of disaster (Bangpan et. al., 2019). Moreover, there are strategies that intend to mainstream psychosocial service provision among different stakeholders, government ministries and the private sector (United Republic of Tanzania, 2022a). Therefore, such strategies can help to address the present challenges.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined psychosocial support services provided to youth and adults affected by land slide disaster in Katesh in Hanang District. The study highlighted the psychosocial support services, which were provided to the affected youth and adults and the challenges, which were encountered in the provision of psychosocial support services. The major findings show that psychosocial support services were provided timely in a good coordinated system. Social support services provided included physical and material support, family and community support,

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information sharing, medication and referrals. Psychological support services included counselling and emotional support and encouragement. The findings also highlighted the challenges encountered in the provision of social support services including inadequate financial and human resources. The findings show that the economic situation of the people was negatively affected due to losses of property, livelihood and earning capacity. Furthermore counselling services and follow up were not sustainable due to limited number of personnel.

5.2 Recommendations

The study recommends for the strengthening of the capacity of local communities through training and skills development in disaster management to ensure their preparedness for disasters, risk reduction and participation in the provision of psychosocial support services. This will ensure continuity and sustainability in the provision of psychosocial support services including psychological counselling services. Secondly, effective coordination and collaboration with local and international agencies in the provision of psychosocial support services should be strengthened. Third, the government through its departments and ministries should strengthen mobilization of funds and resources for effective disaster management.

REFERENCES

Andersen, I., Rossi, R., & Hubloue, I. (2022). Community-level mental health and psychosocial support during armed conflict: A cohort study from the Democratic Republic of the Congo, Mali, and Nigeria. *Frontiers in Public Health, 10*, 1–16. https://doi.org/10.3389/fpubh.2022.815222

Awadhalla, M. S., & Qarooni, S. A. (2018). Disaster responses: Psychosocial support not optional! *KnE Life Sciences, 4*(6), 14–25. https://doi.org/10.18502/kls.v4i6.3087

Bangpan, M., Felix, L., & Dickson, K. (2019). Mental health and psychosocial support programmes for adults in humanitarian emergencies: A systematic review and meta-analysis in low and middle-income countries. *BMJ Global Health, 4*(5), e001484. https://doi.org/10.1136/bmjgh-2019-001484

Becker, J. S., Potter, S. H., McBride, S. K., Wein, A., Doyle, E. E. H., & Paton, D. (2019). When the earth doesn't stop shaking: How experiences over time influenced information needs, communication, and interpretation of aftershock information during the Canterbury Earthquake Sequence, New Zealand. *International Journal of Disaster Risk Reduction, 34*, 397–411. https://www.sciencedirect.com/science/article/pii/S2212420918312792

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

Bretton, O. M. (2024). Mapping the psychosocial: Introducing a standardised system to improve psychosocial understanding within mental health. *Archives of Psychiatry and Mental Health, 8*, 12–19. http://www.psychiatryhealthjournal.com/articles/apmh-aid1051

Brooks, S. K., Dunn, R., Amlôt, R., Rubin, G. J., & Greenberg, N. (2017). Social and occupational factors associated with psychological distress and disorder among occupational groups affected by disaster: A systematic review. *Journal of Mental Health, 26*(4), 373–384. https://doi.org/10.1080/09638237.2017.1294732

Deimling Johns, L., Power, J., & MacLachlan, M. (2018). Community-based mental health intervention skills: Task shifting in low- and middle-income settings. *International Perspectives in Psychology: Research, Practice, Consultation, 7*(4), 205–230. https://doi.org/10.1037/ipp0000097

Dickson, K., & Bangpan, M. (2018). What are the barriers to, and facilitators of, implementing and receiving MHPSS programmes delivered to populations affected by humanitarian emergencies? A qualitative evidence synthesis. *Global Mental Health, 5*, e21. https://doi.org/10.1017/gmh.2018.12

Djordjevic, I., & Gacic, J. (2024). Sustainable recovery: The link between development and response to disasters. *International Journal of Disaster Risk Management, 6*(2), 223–244. https://doi.org/10.18485/ijdrm.2024.6.2.15

Dukiya, J. J., & Benjamine, O. (2021). Building resilience through local and international partner, Nigeria experiences. *International Journal of Disaster Risk Management, 3*(2), 11–24. https://doi.org/10.18485/ijdrm.2021.3.2.2

Duruel, M. (2023). Social service practices in disasters: 6 February earthquake Hatay case. *OPUS–Journal of Society Research, 20*(56), 1141–1152. https://doi.org/10.26466/opusjsr.1385721

El Barazi, A. S. (2023). Psychological support for earthquake survivors in Turkey and Syria. *Journal of Emergencies, Trauma, and Shock, 16*(4), 171–176. https://doi.org/10.4103/jets.jets_46_23

Inter-Agency Standing Committee. (2007). *IASC guidelines on mental health and psychosocial support in emergency settings*. IASC. http://www.humanitarianinfo.org/iasc/content/products

Kaur, B. (2020). Disasters and exemplified vulnerabilities in a cramped public health infrastructure in India. *International Journal of Disaster Risk Management, 2*(1), 15–22. https://doi.org/10.18485/ijdrm.2020.2.1.2

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Kohtz, B., Asher, L., Bhardwaj, A., & Patel, V. (2018). The role of communities in mental health care in low and middle income countries: A review of components and competencies. *International Journal of Environmental Research and Public Health, 15*, 1279. https://doi.org/10.3390/ijerph15061279

Kuckarslan, G. K., Albayrak, H., Selcuk, O., & Guzel, B. (2025). Witnessing memories that are being destroyed: Challenges and staff support in psychosocial support services after 2023. *British Journal of Social Work, 55*(3), 1317–1336. https://doi.org/10.1093/bjsw/bcae194

Leon-Himmelstine, C., Samman, E., Kyungu, E., Roche, J. M., & Plank, G. (2021). Mental health and psychosocial well-being among adolescents in Tanzania: Findings from a mixed-methods baseline study. *Overseas Development Institute (ODI) Report*. https://www.odi.org/en/publications

Liamputtong, P. (2020). *Qualitative research methods* (5th ed.). Oxford University Press.

Milosevic, G., Cvjetkovic-Ivetic, C., & Baturan, L. (2024). State aid in reconstruction of natural and other disasters' consequences using the budget funds of the Republic of Serbia. *International Journal of Disaster Risk Management, 6*(2), 169–182. https://doi.org/10.18485/ijdrm.2024.6.2.11

Murphy, T. F. (2024, July 23). Social support theory. *Psychology Theory. Trauma and Healing*. https://www.psychologyfanatic.com

O'Brien, B. C., Harris, I. B., Beckman, T. J., Reed, D. A., & Cook, D. A. (2014). Standards for reporting qualitative research: A synthesis of recommendations. *Academic Medicine, 89*(9), 1245–1251. https://doi.org/10.1097/ACM.0000000000000388

Puri, A., Elkharboutly, M., & Ali, N. A. (2024). [Title missing]. *International Journal of Disaster and Risk Management, 107*, 104491. https://doi.org/10.1016/j.ijdrr.2024.104491

Safapour, E., Kermanshachi, S., & Pamidimukkala, A. (2021). Post-disaster recovery in urban and rural communities: Challenges and strategies. *International Journal of Disaster Risk Reduction, 64*, 102535. https://doi.org/10.1016/j.ijdrr.2021.102535

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H., & Jinks, C. (2018). Saturation in qualitative research: Exploring its conceptualization and operationalization. *Quality & Quantity, 52*(4), 1893–1907. https://doi.org/10.1007/s11135-017-0574-8

Semerci, M., & Uzun, S. (2023). The effectiveness of post-disaster psychotherapeutic interventions: A systematic review and meta-analysis study. *Asian Journal of Psychiatry, 85*, 103615. https://doi.org/10.1016/j.ajp.2023.103615

Siragusa, A., Vizcaino, M. P., Proietti, P., & Lavalle, C. (2020). *European handbook for SDG voluntary local reviews* (JRC118682). Joint Research Centre. https://doi.org/10.2760/670387

Tanzania Meteorological Authority. (2023). Tanzania's 2023 El Niño outlook: What to expect and how to prepare. https://www.digest.tz/

Taylor, S., & McAvoy, J. (2015). Researching the psychosocial: An introduction. *Qualitative Research in Psychology, 12*(1), 1–7. https://doi.org/10.1080/14780887.2014.958043

Tol, W. A., Le, P. T. D., Hamson, S. L., Galappatti, A., & Annan, J. (2023). Mental health and psychosocial support in humanitarian settings: Research priorities for 2021–2030. *Health Policy: Lancet Global Health, 11*, e969–e975.

United Nations Office for Disaster Risk Reduction. (2023). *The Sendai Framework for Disaster Risk Reduction 2015–2030*. https://www.undrr.org/documents

United Nations Relief and Works Agency. (2017). *Mental health and psychosocial support framework*. https://www.unrwa.org

United Nations. (2019). *United Republic of Tanzania: Disaster risk profile: Building disaster resilience to natural hazards in Sub-Saharan African regions, countries and communities*. UN Disaster Risk Reduction & CIMA Research Foundation. https://www.undrr.org

United Republic of Tanzania – Prime Minister's Office. (2022a). *National Disaster Management Strategy 2022–2027*. Prime Minister's Office, Disaster Management Division. https://www.pmo.go.tz/uploads/documents

United Republic of Tanzania. (2020). *National guide for the provision of psychosocial care and support services* [Unpublished manuscript]. Ministry of Health, Community Development, Gender, Elderly and Children.

United Republic of Tanzania. (2022b). *Population and housing census: Administrative units population distribution report, Tanzania* (Vol. 1A, pp. 1–290). Ministry of Finance and Planning, National Bureau of Statistics, President's Office, and Office of the Chief Government Statistician, Zanzibar.

World Health Organization. (2021). *Mental health atlas 2020*. https://www.who.int/publications/i/item/9789240036703

World Health Organization. (2023). Dealing with the psychosocial aftershock of the Türkiye earthquakes: Why mental and psychosocial support are so desperately needed. https://www.who.int/europe/news/item/09-03-2023-dealing-with-the-psychological-aftershocks-of-the-t-rkiye-earthquakes

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Enhancing the academic performance of students through an online learning system: A case study of Makurumla Secondary School, Tanzania

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ABSTRACT

This study intended to investigate the possibility of using online learning as the solution for improving students' academic performance at Makurumla Secondary School. The Unified Theory of Acceptance and Use of Technology (UTAUT) are used to lead this study. A mixed methods approach is employed because it allowed for a comprehensive understanding of the role of online learning in improving students' academic performance. The quantitative data provided measurable evidence on patterns, trends, and the effectiveness of online learning tools, while the qualitative data offered deeper insights into teachers' and parents' experiences, perceptions, and challenges. Therefore, using both methods together ensured that the research captured not only statistical relationships but also the contextual realities behind them. The stratified random sampling technique was used. The study was conducted at Makurumla Secondary School in Ubungo Municipality. The target population for this study included teachers, students, and parents, from which a sample of 321 respondents was selected to provide data for the study. Data collection methods include questionnaires, interviews, and focus group discussions. Quantitative data are processed by using SPSS and analyzed using descriptive data analysis and multiple regression analysis. While in Qualitative data from interviews and focus group discussions are analyzed through content analysis and MAXQDA software, which is a qualitative and mixed-methods data analysis software used by the researchers to organize, code, analyze, and visualize data. The findings reveal that the majority of the students at Makurumla Secondary School are interested in and have access to an online learning system at their home, but the school infrastructure does not support implementing the online learning system. The study concluded that for the implementation of online learning in secondary schools, there should be sufficient and supportive infrastructure, such as computers, computer laboratories, stable electricity, and strong internet connectivity. The study recommended that the school should ensure that students and teachers have access to digital devices and a strong and stable internet connection, and that teachers receive proper training to use the online learning system effectively.

Keywords: Academic performance, Learning, Online Learning System, Students, Tanzania

1. INTRODUCTION

In the beginning of the twentieth century, there have been numerous efforts to transform advanced education to online learning for the purpose of improving academic performance of the students (Baum & McPherson, 2019). An instant implementation of online learning has forced by the COVID-19 pandemic. The initiatives to control the spread of COVID-19 pandemic were to implement lockdown, social distancing measures and stay home. Suddenly pedagogy in education change, the online classes became an important part of upholding educational continuousness to improve academic performance of the students (Wangdi et al., 2021). Online learning refer to the uses of the Internet to interact with the content, instructor, access learning materials, and other learners so as to attain knowledge (Ally, 2004). Academic performance is the outcome which is given out by the students after measured through test scores, grades and overall classroom performance (Crisp, 2002).

Makurumla Secondary School is a public secondary school located in Dar es Salaam, Tanzania. It is a co-educational institution, meaning it educates both boys and girls. The school offers a range of facilities, including dedicated science laboratories, classrooms, an outdoor football field, and library. It follows the curriculum set by the National Examinations Council of Tanzania (NECTA) and administers exam such as the Certificate of Secondary Education Examination (CSEE) with center number S.4506 (Shulewiki, 2023). Since the Makurumla secondary school was facing with the problem of poor academic performance of the students due to poor students attendance at school (Shulewiki, 2023). Therefore, this study has focused with improving the student's academic performance through Online Learning at Makurumla secondary school, since it used as alternative way to attend class lessons. Independent variable of this study is Online Learning, since it represents the mediation introduced at Makurumla

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Secondary School. And students' academic performance is the dependent variable, which point the outcomes influenced by the adoption of Online Learning strategies.

The discourse close to Online Learning has pulled importantly attention. Other scholarly person assist its potentials to improve flexibility, accessibility, and student engagement, and others high spot challenges for implementation of Online Learning System in schools. Online learning enhances the academic performance of the students who since the online learners attain better results than those who studied traditional approach (Elfaki & Abdelrahim, 2021). Also according to Ododo (2022) show that e-learning tools are important for improving learners' academic performance in data structure since it encourages students' interest in the learning content. But according to Wangdi et al (2021) the implementation of Online Learning in students of Secondary schools faces considerable obstacles including lack of internet facilities, inconstant internet connection, inadequate internet data and low income to satisfy the internet data cost. Earnest challenges on adoption of online leaning in Tanzania higher learning institutions include poor infrastructural, especially in terms of power supply, bandwidth capacity, computer laboratories (Kisanga & Ireson, 2015). Also according to Ndume (2008) reveal that IT infrastructure, power interruption, resource accessibility and availability is a problem for implementing e-Learning.

However the present literatures high spot the importance of Online learning in enhancing academic performance of the students, but there was an important deficiency of study direct specifically on how online learning enhancing academic performance at Makurumla secondary school. This study attempted to close this gap of examining on improving academic performance through online learning at Makurumla secondary school.

1.1 Statement of the Problem

In recent years, advancements in technology have made Online Learning an attractive option to traditional education, particularly in secondary schools. However, the adoption of Online Learning in students of Secondary schools faces considerable obstacles which are lack of internet facilities, inconstant internet connection, inadequate internet data and low income to satisfy the internet data cost (Wangdi et al., 2021).

According to Komakech (2015) the effects of poor school attendance to students include poor academic performance, students drop out, graduating half-baked students, poor curriculum coverage and loss of interest in learning . Since the performance of the students is affected by the class lesson attendance, there is the need of enabling the Online Learning to secondary Schools because students are equipped with teaching and learning experiences that are not limited to the classroom education (Odunaike et al., 2025).

Based on Shulewiki (2023) reported the Annually Percentage Average of the students school attendance in 2022 was 69.8% and 2023 was 67.3%. This report further indicates that the poor class attendance adversely affects the students' performance. The Shulewiki (2023) report highlighted several reasons for poor student's attendance including lack of bus fare, sickness, taking care of their sick parents and poor road infrastructure especially when it heavily rain. The poor students' school attendance resulted into poor academic performance to students.

Therefore, this study intended to investigate the possibility of using Online Learning as the solution for improving students' academic performance at Makurumla secondary school because the Online Learners experiences new learning style that are not limited to the classroom attendance thus providing opportunity to those students who failed to attend class lesson for various reasons.

1.2 Research Objective

i. To identifying the requirements for introducing an Online Learning System, the study establishes the necessary conditions such as infrastructural, technological and pedagogical conditions for effective adoptions.
ii. To evaluating the effectiveness of different Online Learning teaching strategies and tools, the study finds out the approaches that most positively influence students' learning outcomes.
iii. To recommending a practicable approach for implementing Online Learning, the study provides actionable strategies that schools can adopt to enhance teaching and learning.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Unified Theory of Acceptance and Use of Technology (UTAUT)

According to Alkhuwaylidee (2019) Unified Theory of Acceptance and Use of Technology (UTAUT), is an extensive model established to clarify user intentions and behaviors regarding technology acceptance. Also Alkhuwaylidee (2019) said that Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. in 2003 developed this theory in order to explore the aspects that inspire user intentions to accept and use technology. The theory providing a comprehensive framework with four key constructs as it synthesizes elements from eight previous models of technology acceptance. Those constructs are:

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Performance Expectancy (PE): Performance Expectancy is the degree in which the improvement of job performance is perceived by applying a technology. The significant predictor of behavioral intention between others constructs of UTAUT is Performance Expectancy. The Performance Expectancy suggesting that if users believe that the present technology will advance their productivity then they will accept to use the technology**.** Basing on this study, performance Expectancy fostered those students and teacher might accept online learning if they expect it to improve academic outcomes or teaching efficiency.

Effort Expectancy (EE): Effort Expectancy play a vital role of measuring the perceived ease of using associated with the technology. A lower effort expectancy usually leads to a higher intention to apply the technology, this showing that users select systems that are easy to understand and operate**.**

The application of Effort Expectancy to this study was to enable the creation of user-friendly online platform which can increase the likelihood of acceptance by both students and staff.

Social Influence (SI): Social Influence is the degree in which individuals perceive that important other (such as peers or supervisors) believe that they should use the new system. Social influence, especially in organizational contexts, peer pressure can impact behavioral intention. The use of this construct for this study was that teachers and students might feel compelled to use online tools if they see their peers or school leadership endorsing them..

Facilitating Conditions (FC): This includes the resources and support obtainable to users which ease their ability to use the technology effectively. It contains aspects such as technical infrastructure and organizational support, which directly affect user behavior.

The application of Facilitating Condition construct to this study was to access computers, internet connectivity and technical support which will be vital for successful implementation.

2.2. Conceptual Review

In this study Performance expectancy, Effort expectancy, Facilitating conditions and Social influence are considered as Independent variables. These factors are expected to influence the manner in which Online Learning is adopted and used in Secondary schools. While the improved students' academic performance used as the Dependent variable, which represents the final results of effective implementation and utilize of Online Learning. In addition, Supportive political will is considered as a Co-factor, as it acts as a moderating role by making an enabling environment through policies, regulations, and government support that facilitate the successful integration of Online Learning in schools.

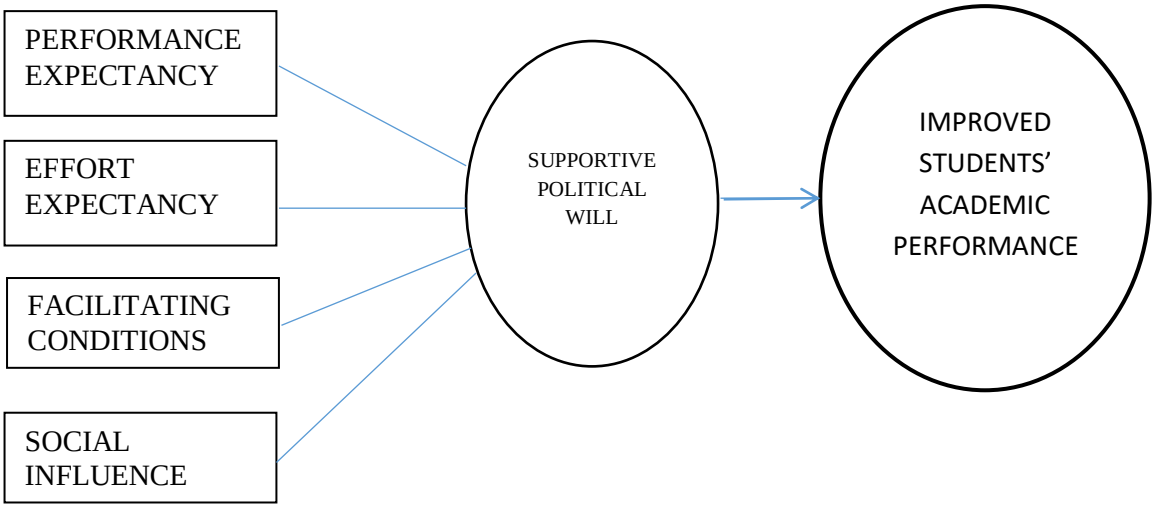

Figure 1
Conceptual frame work

2.3 Empirical Review

According to Lakkala (2020) discovered that online learning improves the academic performance of the upper secondary students in Finland Country since courses were organized by both the private company and the teachers, the private company provide the basic structure of the digital course platform for the teachers but the teachers organized their course areas and the lessons based on the affordances of the platform. Online learning improves the academic performance of the students who since the online learners attain better results than those who studied traditional approach (Elfaki & Abdelrahim, 2021). According to Ododo (2022) reveal that e-learning tools are crucial for enhancing learners' academic performance in data structure since it promotes students' interest in the learning content.

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According to Charles et al (2022) found that low level of investment discourage the effective performance of e-learning to improve the students' academic performance. Therefore Charles et al (2022) recommended that, the Open University of Tanzania management and other educational stakeholder should modify the total investment of e-learning at university level.

Serious problems on implementation of online leaning in Tanzania higher learning institutions include poor infrastructural, especially in terms of power supply, bandwidth capacity, computer laboratories (Kisanga & Ireson, 2015). Also according to Ndume (2008) reveal that IT infrastructure, power interruption, resource accessibility and availability is a problem for implementing e-Learning.

According to Nambambi (2022) reveal that online learning stimulate students of Namibia Business School to achieve better in their formative and summative assessments. Nambambi (2022) suggested that online lecturers must continue to develop valuable instructional and teaching materials that dynamically connect students and motivate them to perform better. Chacha and Kitula (2022) suggested that as it has been discovered that accessibility of ICT has a great inspiration on academic performance of the students in secondary schools, therefore, the government should deliver ICT tools in secondary schools so as to advance the academic performance of the students.

III. METHODOLOGY

3.1 Research Design

The mixed method approach was the research design for this study because it allowed for a comprehensive understanding of the role of Online Learning in improving students' academic performance, the quantitative data provided measurable evidence on patterns, trends and the effectiveness of online learning tools while the qualitative data offered deeper insights into teachers' and parents' experiences, perceptions and challenges . Therefore, using both methods together ensured that the research captured not only statistical relationships but also the contextual realities behind them. Quantitative methods permit for the gathering of numerical data while Qualitative methods offer detailed understandings into contestants' experiences, perceptions, and attitudes, which are vital for understanding the context-specific challenges of online learning (Almeida, 2018).

3.2 Population of the Study

The population intended for this study involved Students, teachers, and parents of the students at Makurumla secondary schools.

3.3 Sample Size

The sample size refer to the number of members needed to notice a clinically relevant treatment effect (Charles & Giraudeau, 2006). The sample size for this study was 321 respondents.
According to Mwiinde (2024) the Slovin formula is as follows:

$$n = \frac{N}{1+N(e^2)}$$

Table 1
Sample Size

Strata	Population	Sample Size
Teachers	45	9
Students	1558	307
Parents	25	5
Total	**1628**	**321**

3.4 Sampling Technique

To obtain participants for the sample size, this study employed Stratified random sampling technique. For in-depth exploration of each stratum's unique experiences and perspectives, stratified random sampling conducted Semi-structured interviews to school teachers' strata and focus group discussion to parents' strata from each stratum to gather detailed insights into their experiences with online learning. Again, stratified random sampling enabled collection of numerical data by distributing of structured questionnaires to sampled participants students to quantify their experiences with online learning.

3.5 Data and Data Collection Methods

The study used Semi-structured interview, focus group discussion and structured questionnaires to gather primary data. Structured questionnaires were distributed to students to collect the numerical data direct from the field while Semi-structured interview were conducted to teachers to collect detailed insights into their experiences with

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online learning and also the focus group discussion were conducted to parents to collect detailed experiences on online learning.

3.6 Data Analysis

Data analysis in mixed research includes integrating both quantitative and qualitative data to provide an extensive understanding of the research problem. In quantitative research, data has been processed by using SPSS and analyzed using descriptive statistics and multiple regression analysis. While in qualitative data from interview and focus group discussion were analyzed through the Content analysis and MAXQDA.

IV. FINDINGS & DISCUSSION

4.1 Demographic Information of the Respondents

This part shows the demographic characteristics of the respondents. The researcher asked questions about gender, secondary level, age, and programs. The results are shown in Table 2.

Table 2

Demographic Information

Demographic	Category	Frequency	Percentages (%)
Gender	Male	139	45.3
	Female	168	54.7
	Total	**307**	**100**
Secondary Level	Form One	-	-
	Form Two	-	-
	Form Three	123	40.1
	Form Four	184	59.9
	Total	**307**	**100**
	12-16 years	131	42.7
Age	17-19 years	170	55.3
	20-22 years	6	2.0
	Total	**307**	**100**
Programs	Science	108	35.2
	Arts	69	22.5
	Business	130	42.3
	Total	**307**	**100**

The demographic data presented in Table 2 provides a detailed overview of the participants (n=307) involved in the study. The table categorizes the demographic characteristics of the respondents based on gender, educational level (referred to as secondary level), age and academic programs. This interpretation examines each demographic factor in detail, exploring the implications and patterns that emerge from the distribution of the data.

S -

4.2 Requirements for Introducing Online Learning System to Secondary Schools

The implementation of Online Learning system in secondary schools needs some necessary requirements discussed in this first specific objective of the study. This part centered on understanding the technological devices required, the level of digital literacy among students, and the necessary training and support mechanisms.

4.2.1 Access to Online Learning

The study wanted to know the accessibility of online learning by students. Respondents were asked questions and findings are indicated in Table 3.

Table 3

Access to Online Learning

Response	Frequency	Percent (%)
Yes	289	94.1
No	18	5.9
Total	**307**	**100**

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The outcomes from the Table 3 above show large number of the students 289(94.1%) out of 307 had access to online learning system, while only 18 students (5.9%) reported of not having such access. Also according to Ododo (2022) reveal that e-learning tools are important for improving students' academic performance in data structure since it encourages learners' interest in the learning content. Hence this confirm that most of the learners had the opportunity to engage with analogue platforms and resources which show that the facilitating conditions as independent variable is full-filled to now days students, which could influence their learning experiences and performance which is dependent variable in this study. The small number of students with no access to Online Learning System may be due to lack of devices, poor internet connectivity, or socioeconomic constraints, which may affect their academic engagement and performance. The outcomes are backed up by the responses obtained after the conduction of a focus group discussion from the parents;

> *"I make sure my child has a reliable smartphone and a tablet, and I provide a stable Wi-Fi connection at home. I often help her set up the devices and troubleshoot any connectivity issues. Additionally, I monitor her usage to ensure she stays focused on her studies and has access to the educational resources she needs." (Parent 1:10/04/2025).*
>
> *"I have a shared laptop that our son uses for his online classes and homework. To ensure he always has internet access, we keep the Wi-Fi router in a central location and sometimes use a mobile hotspot when the main connection is slow or unavailable." (Parent 2:10/04/2025).*

Therefore equal opportunities to all students to access online learning system should be ensured by the school by conducting parents meeting in school for the purpose of educating and involve the parents to support their children with the access to online learning to improve their academic performance.

4.2.2 Technological Resources at Home to Access and Support Online Learning

The study aimed to identify technological resources that currently students have at home to access and support online learning. Findings are shown in Table 4.

Table 4

Technological Resources at Home to Access and Support Online Learning

Technological resources	Frequency	Percent
Computer	30	9.8
Smartphone	251	81.8
Tablet	20	6.5
Never	6	2.0
Total	**307**	**100.0**

Table 4 findings show the kind of technological devices accessible to students at home that can support online learning. Large number of the students(81.8%) has access to smartphones while (9.8%) students have access to computers. Only 6.5% of the students reported access to tablets. A small percentage(2.0%) of the students reported that they never have access to any of these devices. From the findings above reveal that facilitating conditions, performance expectancy, effort expectancy and also social influence as independent variables are full-filled since large number of the students have access to online learning at home with different devices, this will be able to meet the independent variable which is improved students' academic performance easily. Also the findings from the focus group discussion conducted to parents supports the findings where one of the parents said that;

> *"As a parent, I strongly believe that providing students with access to technological resources is essential for their success in online learning. My child has a reliable laptop and high-speed internet at home, which has allowed them to participate fully in virtual classes, complete assignments, and access educational materials without frustration. I appreciate the school's efforts to ensure all students have the necessary tools, as it helps bridge gaps and supports a more equitable learning environment." (Parent 1:10/04/2025).*

Data indicate that most of the students trust on smartphones for online learning engagement, which can be effective but may also airs boundaries such as small screen size or limited functionality for certain educational activities. Therefore this study advises parents should make effort to provide computer to their children although it is expensive since access to computers is more suitable for comprehensive tasks such as writing essays, completing assignments and engaging with educational software. Having access to a computer can enhance the quality of online learning by providing better screen size, keyboard use and multitasking capabilities.

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4.2.3 Ownership of the Technological Resources at Home

The findings in Table 5 show data which represents the ownership and access of students on different technological devices at home, which are essential for involved in online learning. The table classifies resources into computers, smartphones, tablets, and those with no access (Never).

Table 5

Ownership of the Technological Resources at Home

Category		The technological resource you select, does it belong to you?	
		Yes	No
Technological resources do student currently have access to at home	Computer	11.7%	8.2%
	Smartphone	78.1%	84.7%
	Tablet	10.2%	7%
	Never	0%	0%

This study tried to observe the technological resources do students currently have access at home and their ownership status compared to other studies most of them rely on improvement of school technological infrastructures for online learning implementation, example study conducted by Chacha and Kitula (2022) recognized that in Karatu district ICT had an important and positive effect on academic performance of the students in secondary schools because it is utilized to achieve various tasks such as making assignments, classroom activities and planning their lessons more efficiently. Therefore suggested that, the government should deliver ICT tools in secondary schools so as to advance the academic performance of the students. Table 5 outcomes indicate that only 11.7% of the students owning a personal computer, while 8.2% do not have access to one at home.78.1% of the students have access to smartphones but 84.7% show that they do not own the devices themselves. This verify that many students access smartphones owned by family members including mother, father, sister and uncle, which highlighting the importance of mobile devices for online learning. Also 10.2% of students have access to tablets while only 7% do not, which suggesting that tablets are less common but still available to some students .Here the dependent variable which is Improved students' academic performance through Online learning system will be achieved since large number of students have resources to access online learning system which act as independent variable in this study. These results are backed up by one of the teachers in interview who said that;

> *"I recognize that internet access is crucial for effective online learning. To address this, we as school are exploring options such as distributing portable Wi-Fi devices to students in need." (Teacher 3:15/04/2025)*

Although, restricted possession of computers could limit the ability of some students to fully participate in more online learning activities. Since the percentage of students with no access at all indicate 0%,this show that large number of students have some kind of technological resource at home, but also disparities in device ownership can affect learning experiences and performance. After realizing these challenges, teachers should find the solutions such as distributing portable Wi-Fi devices to improve internet access, and also to educate the parents to buy computer or smartphone for their children, aiming to ensure all students can participate effectively in online learning.

4.2.4 Frequency of the Use Technological Resources among the Students

Table 6 reflects findings of how frequently students use technological resources including computer, smartphone, tablet, they have at home that support online learning. It categorizes the data by how often students utilize these resources daily, weekly, occasionally, rarely, or never.

Table 6

Frequency of the Use Technological Resources among the Students

Category		How often do you use technological resources you select?				
		Daily	Weekly	Occasionally	Rarely	Never
What technological resources do you currently have access to at home that could support online learning	Computer	12.4%	7.4%	7.1%	0.0%	0.0%
	Smartphone	80.1%	92.6%	78.6%	100.0%	0.0%
	Tablet	7.5%	0.0%	14.3%	0.0%	0.0%
	Never	0.0%	0.0%	0.0%	0.0%	100.0%

From the table above show that large number of the learners(80.1%) reported using smartphones daily, and an even higher percentage (92.6%) use them weekly, this show that smartphones are the most accessible and frequently used device for online learning among the students. Occasional use was 78.6% of students participating with their smartphones on an irregular basis, while no student reported, rarely or never, using these devices. In opposition, access to computers was less prevalent, only 12.4% of students reported daily use of computers, and 7.4% used them

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weekly. A smaller percentage, 7.1%, used computers occasionally, and none indicated that they rarely or never use them. This advises that while some learners have access to computers, they are less frequently used compared to smartphones, possibly due to restricted availability or affordability. Access to tablets was even more limited. Just 7.5% of learners use tablets daily, with no learners reporting weekly use. Some learners (14.3%) used tablets occasionally, but the many of them did not have access or did not use tablets at all. Notably, no learners reported never using tablets, which show that at least some students have access to these resources. Overall, these outcomes high spot that smartphones are the primary technological devices used often for online learning among students.

This research advice that although smartphone utilized more than other resources outlined by the respondents but it is better for parents to get a computer for their children because access to a computer can improve the quality of online learning by providing better screen size, keyboard use, and multitasking capabilities.

4.2.5 Status of Online Infrastructure Exist at School to Implement Online Learning System

The study sought to know whether infrastructure exist at school satisfy to implement online learning system. The findings presented in Table 7 reveal a significant insight into the state of technological infrastructure at a particular school concerning the implementation of an Online Learning System.

Table 7

Status of Online Infrastructure

Response	Frequency	Percent
Yes	10	3.3
No	297	96.7
Total	**307**	**100**

The table above shows that many of the respondents respond that the infrastructure exist at their school is deficient to support the adoption of an online learning system. 3.3% of the responders answered "Yes" which indicate that the available infrastructure meets the essential requirements for online learning system. But, 96.7% of responders replied "No," which show that the exist infrastructure is deficient. In this situation, imply that independent variables in this study which are Performance expectancy, effort expectancy, facilitating conditions, social influence are not full-filled in this school to meet the dependent variable which is improved students' academic performance through online learning system. Also according to Ally (2004) reveal that one of the serious problem in implementation of Online learning systems in Tanzania higher learning institutions is existence of poor infrastructure .Then compared to our findings in this study show that the problem also exist to secondary schools. During the interview session one of the teacher supports the response of the students by saying that;

> *"Our school lacks the necessary infrastructure such as reliable internet connectivity and adequate computer facilities, which are critical for implementing an effective online learning system." (Teacher 1:13/04/2025)*

Existence of required infrastructure is important for implementation of online learning system which can be accessible, effective, and equitable for all students. Without that, the crucial benefits of online learning system can remain unsuccessful, and students may proceed to face obstacles that restrict their academic development

4.2.6 Preference to any Specific Training When Transitioning to an Online Learning System

The study sought to know whether students prefer any specific training when transitioning to an Online Learning System. The findings are presented in Table 8.

Table 8

Preference to Specific Training

Response	Frequency	Percent
Yes	295	96.1
No	12	3.9
Total	307	100

From the table above show that many of the respondents about 96.1% prefer to receive some form of specific training when transitioning to an Online Learning System. Then this high percentage indicate that majority realize the importance of training for effectively adapt to the new mode of learning. Conversely, a small proportion of respondents, 3.9%, expressed no interest in receiving specific training during this transition. The findings of this study is supported by the study conducted by scholar known as Lakkala (2020) who discovered that Online learning system improve the academic performance of the students in Finland country because courses are organized well by both

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private company and teachers, teachers organized their course areas and the lessons based on the concordances of the platform. This show that for the teachers to organize their courses well to win the goal of improving the academic performance of the students specific training is needed .. Overall, the high preference for training emphasizes the importance of providing targeted orientation and skill development programs to facilitate a smooth transition to online learning. Implementing such training can enhance students' confidence, improve their ability to utilize online platforms effectively, and ultimately contribute to better academic outcomes. These results imply that educational institutions should prioritize developing comprehensive training modules, ensuring accessibility for all students, and addressing any technological gaps to support a successful shift to online education.

In addition, one of the teachers said that;

> *"I would prefer comprehensive training focused on the effective use of digital tools and Learning Management Systems (LMS) like Moodle or Google Classroom. Understanding how to design engaging online lessons, manage virtual classrooms, and assess student performance digitally is essential for me to deliver quality education in an online setting." (Teacher 2:14/04/2025)*

Another respondent said that;

> *"Hands-on, practical training sessions where I can directly practice using various online platforms and tools would be my preference. Having guided workshops or tutorials that allow me to troubleshoot common issues and explore features firsthand would boost my confidence and preparedness for transitioning smoothly." (Teacher 4:17/04/2025)*

4.3 Multiple Regression Analysis: Model Summary Result

Introduce the table

This table below show the key statistical indicators connected to the analysis done on enhancing students' academic performance through Online Learning System.

Table 9

Model Summary Result

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.675[a]	.556	.437	.37119	1.745

a. Predictors: (Constant), Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, and Supportive Political Will

b. Dependent Variable: Improved Students' Academic Performance

From the table 9 above, Model 1, has an R value of 0.675. This imply an average to strong positive correlation between the predictors, namely Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, and Supportive Political Will and the dependent variable, which is Improved Students' Academic Performance.

0.556 is the R square value for this model, which is approximated as 55.6% of the variability in students' academic performance which can be explained by the united effect of the chosen predictors. When attuned for the number of predictors in the model, the Adjusted R Square drops slightly to 0.437, propose that some predictors cannot contribute significantly or that the model could be refined further to modify explanatory power.

The Standard Error of the Estimate is 0.37119, this reflect the moderate distance that discovered values fall from the predicted values generated by the model. A lower standard error show a finer fit of the model to the data. Last, the Durbin-Watson statistic of 1.745 proposes that there is no powerful evidence of auto-correlation in the residuals, which assist the assumption that the residuals are independent an essential condition for the validity of many regression analyses.

Overall, these outcomes indicates that the combination of factors like performance expectancy and social influence significantly contributes to improving students' academic performance in an online learning environment, and the model provides a reasonably good fit to the data.

4.3.1 Coefficients of Regression Model

From the Table 4 below, the coefficients are there to provide key vision into the factors that significantly influence student performance in an online learning environment. The analysis provides a regression model where the dependent variable is "Improved Students' Academic Performance," and independent variables include Performance Expectancy, Effort Expectancy, Facilitating Conditions, Social Influence, and Supportive Political Will. The table indicates both unstandardized and standardized coefficients, along with t-values and significance (p-values), to evaluate the statistical outcome of each predictor.

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Table 10

Factors Influence Student Performance in an Online Learning Environment

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.523	.206		2.540	.013
	Performance Expectancy	.230	.100	.238	2.307	.023
	Effort Expectancy	.261	.073	.352	3.599	.001
	Facilitating Conditions	.247	.110	.226	2.236	.028
	Social Influence	.217	.107	.213	2.131	.021
	Supportive Political Will	.067	.0210	.103	2.012	.328

Firstly, the constant (intercept) is 0.523 with a p-value of 0.013, which is statistically significant at the 5% level. This implies that even when all independent variables are held constant at zero, students' academic performance is expected to start at a positive baseline, suggesting the presence of other contributing factors outside the scope of this model.

The variable Performance Expectancy, with a standardized beta coefficient of 0.238 and a p-value of 0.023, has a statistically significant and positive effect on academic performance. This means that when students perceive online learning as useful and believe it will help them achieve better outcomes, their academic performance is likely to improve. The implication is that promoting the practical benefits of online learning systems can foster better engagement and outcomes among students.

Effort Expectancy shows the highest standardized coefficient (0.352) and is highly significant ($p = 0.001$). This indicates that students' perceptions of how easy online learning systems are to use greatly influences their academic success. When students find the systems intuitive and easy to navigate, they are more likely to interact effectively with the material, leading to better performance. This underscores the importance of user-friendly online platforms and adequate student training in maximizing the benefits of online learning.

The role of Facilitating Conditions is also notable, with a significant positive influence ($\beta = 0.226$, $p = 0.028$). This refers to the availability of the necessary infrastructure, resources, and support systems, such as internet access, technical assistance, and compatible devices. When these conditions are adequately met, students are better positioned to thrive in an online learning environment.

Social Influence also emerges as a statistically significant predictor ($\beta = 0.213$, $p = 0.021$), suggesting that peer opinions, instructor encouragement, and community attitudes towards online learning play a role in shaping students' engagement and performance. A positive social climate around online education may thus encourage more active and confident participation from learners.

However, Supportive Political Will, although having a small positive beta value (0.103), does not show statistical significance ($p = 0.328$). This suggests that while governmental or institutional backing for online learning may be important, it is not directly influencing student performance in this specific context. It may be that such support operates more indirectly, through funding infrastructure or policy development, than through immediate academic outcomes.

V.CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study has demonstrated that the adoption of Online learning system to secondary schools can improve the academic performance of the students when supported by specific proper training, policy frameworks and with adequate and supportive infrastructures such as computers, computer laboratory, stable electricity, strong internet connectivity.

5.2 Recommendation

Based on the outcomes of this study, it is recommended that the school should make sure that learners and teachers have access to analogue devices such as computers, tablets and smartphones, to enable them the access to online learning system. Also the school administration should ensure that there is strong internet connection by work with local service providers to offer free or subsidized Wi-Fi hotspots to students who do not have reliable internet at home. Furthermore there is need of prioritizing teacher and students training, involvement of parents to support smoothly the main objective for the implementation of online learning system to secondary school to be successfully. In addition, policy makers should supply supportive policies and devices that promote schools to implement and sustain technology enhanced teaching.

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REFERENCES

Alkhuwaylidee, A. R. (2019). Extended unified theory acceptance and use technology (UTAUT) for e-learning. *Journal of Computational and Theoretical Nanoscience, 16*, 1–8.

Ally, M. (2004). Foundations of educational theory for online learning. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning* (2nd ed., pp. 15–44). Athabasca University Press. http://www.aupress.ca/books/120146/ebook/01_Anderson_2008-pp16-17

Almeida, F. (2018). Strategies to perform a mixed methods study. *European Journal of Education Studies, 8*(5), 137–151. https://doi.org/10.5281/zenodo.1406214

Baum, S., & McPherson, M. (2019). The human factor: The promise & limits of online education. *Daedalus, 148*(4), 235–254. https://doi.org/10.1162/DAED_a_01769

Chacha, C. W., & Kitula, P. R. (2022). Availability of information and communication technology and its influence on students' academic performance in Karatu District, Tanzania. *Journal of Research Innovation and Implications in Education, 6*(5), 549–559.

Charles, P., & Giraudeau, B. (2006). Reporting of sample size calculation in randomised controlled trials: Review. *BMJ*. https://doi.org/10.1136/bmj.b1732

Charles, C., Malusu, P. J. M., & Ogoti, P. E. (2022). Influence of E-Leaning on Students' Academic Performance at the Open University of Tanzania. *International Journal of Contemporary Applied Researches, 9*(7), 85-97.

Crisp, C. (2002). ENB school performance. *Dancing Times, 92*(1104), 41, 353–354.

Elfaki, N., & Abdelrahim, R. (2019). Impact of e-learning vs. traditional learning on students' performance and attitude. *International Medical Journal, 24*(3), 225-233.

Kisanga, D., & Ireson, G. (2015). Barriers and strategies on adoption of e-learning in Tanzanian higher learning institutions: Lessons for adopters. *International Journal of Education and Development Using Information and Communication Technology, 11*(2), 126–137.

Komakech, R. A. (2015). School attendance is a pre-requisite for student academic performance in universal secondary education schools. *Journal of Social Science for Policy Implications, 3*(1), 33–57. https://doi.org/10.15640/jsspi.v3n1a3

Lakkala, M. (2020). Finnish upper secondary school students' experiences with online courses. *Education in the North, 27*(2), 73–91.

Makurumla Secondary School. (2023). *Shulewiki*. https://shulewiki.co.tz/makurumla-secondary-school/trend

Mwiinde, Z. D. (2024). *An analysis of revenue management efficiency at Lusaka City* (pp. 22–23) [Unpublished master's thesis]. The University of Zambia.

Nambambi, H. I. (2022). *Assessing the impact of online learning on student performance at the Namibia Business School during COVID-19* [Master's thesis, The University of Namibia].

Ndume, V. (2008). Challenges of adaptive e-learning at higher learning institutions: A case study in Tanzania. *International Journal of Computing and ICT Research, 2*(1), 47–59. http://www.ijeir.org/volume1-number2/article6.pdf

Ododo, E. P. (2022). A publication of International Association for the Promotion of Asia-Africa Research in collaboration with Medicaps University, India. *Asia-Africa Journal of Education Research, 2*(2020), 157–177. https://doi.org/10.5281/zenodo.6370171

Odunaike, S. A., Olugbara, O. O., & Ojo, S. O. (2025). E-learning implementation critical success factors. In *Proceedings of the International MultiConference of Engineers and Computer Scientists 2013* (Vol. 1, pp. 2–3). IMECS 2013, Hong Kong.

Shulewiki. (2023). Makurumla Secondary School. https://shulewiki.co.tz/makurumla-secondary-school/trend

Wangdi, N., Dema, Y., & Chogyel, N. (2021). Evaluating the challenges in online learning during the COVID-19 pandemic in a middle secondary school. *International Journal of Didactical Studies, 1*(2), 7–8. https://doi.org/10.33902/ijods.2021269731

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Exploring the perceived level of satisfaction with the quality of library services in university libraries in Tanzania

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ABSTRACT

This study explores the perceived level of satisfaction with the quality of library services (QLS) in university libraries in Tanzania. Specifically, the study analyzed the extent to which services influence library users' level of satisfaction and assessed how users perceive their satisfaction with the quality of library services. The study was guided by the SERVQUAL model, and it used a cross-sectional research design. The population of this study involved academic staff, students, heads of higher learning institutions, directors of libraries, quality assurance officials, heads of departments in the libraries, and library staff, amounting to 64,988 and Simple random sampling and purposive sampling procedures were used to select 397 respondents and 68 key informants. Questionnaires and interviews were used to collect data and were analyzed using the Statistical Package for Social Sciences (SPSS) tool version 20 and content analysis for qualitative data. The key findings revealed that 75% of library staff were approachable, polite, friendly, empathetic, and available to respond timely to users' needs. Moreover, 61.2% indicated that time provided for using the library was adequate for users, and results from binary logistic regression show that noise, poor photocopy services, lack of air conditioning, lack of weekend services, and early closing time had a statistically significant influence on users' satisfaction with library services. Moreover, the study found that 38% opined that a good library provides users with advisory services; sufficient collection was mentioned by 33.8%. Seating arrangements and an attractive environment to learn were rated at 47.9%. However, 13% disagreed that a good library provides reservation/booking services. The study therefore concluded that library users were satisfied by the university libraries' services in terms of collection, environment, staff, facilities, and services provided. Library management should have a current collection/facilities, a conducive environment, trained staff, and adequate furniture.

Keywords: Library Users, Librarians Perception, Tanzania, University Libraries, Quality of Library Services

I. INTRODUCTION

The functions of university libraries are to support and contribute to university activities which includes teaching, learning research and consultancy. The library acquires information materials, catalogue, classify/organize information and disseminate it according to its users. Information has been identified as important key to cover all development of human being (United Nations, 2022). According to Robinson (2022) academic library is the central organ of the university, in which together with good laboratories and faculties form an important parameter of judging the status and quality of the university. On the other hand, Mubofu *et al.* (2020) described library as an establishment charged with the responsibility for acquiring books, making them accessible to those who require them and converting every person in its neighbourhood into habitual library users. Therefore, the library must create a balance between specific research and information needs and a usable collection of information materials to meet the need of the university's academic programmes. According to Ashilungu and Onyancha (2024), an academic library has the mission to build and maintain a collection that will support academic needs of the university and provide access to all sources of information. Similarly, Khan and Shahzad (2024) observes that, the role of the university library is to achieve academic excellence and thus; the library has to play vital role since a university is incomplete without a good library.

Studies have shown strong correlations between information quality and use as well as between user perceptions and satisfaction. These relationships have been influencing changes in library operations towards improving the quality of library services provision (LSP) (Shahzad *et al.*, 2021). Rapid technological advancements in information science have changed how libraries provide services. It has redefined how information is collected and increased demands on the skills of library staff, library facilities, and the entire infrastructure of libraries (Vijayalatha, 2023). Through post-utilization evaluations, library decision makers are concentrating on raising service standards and enhancing the user experience. For service-oriented businesses, customer satisfaction is essential since happy customers are devoted,

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upbeat, and likely to recommend services. According to Kaushik (2022), service quality is determined by users' assessment of their experience with the product or service obtained. This study aimed at exploring the perceived level of satisfaction with the quality of library services on university libraries in Tanzania. It focused on five key entities: library staff, library services, library collection, library as a place, library facilities, and how they impact the actual experience of library users and their satisfaction levels.

1.1 Statement of the Problem

The impact of perception on the utilization of university library resources and facilities cannot be underestimated. According to Khan and Shahzad (2024), there has been a shift from traditional library services to a modern approach. This shift has influenced how library users perceive information services offered and how they utilize it. Additionally, the rise of ICTs has led to increased access to information through the internet, resulting in decreased interest in traditional library services. This, in turn had a negative impact on the reputation and relevance of libraries (Idowu & Oso, 2022; and Mushi *et al*., 2020). While this shift from traditional library service provision is well documented from other studies above, the situation is opposite from Tanzanian experience, where the perceptions and satisfaction of university libraries exhibiting hybrid environment services is unknown. This warranted the present study.

1.2 Research Objectives

i. To analyse the extent to which the library services influences library users' level of satisfaction
ii. To assess how library users, perceive their satisfaction with the quality of library services.

1.3 Research Questions

i. How does various type of services contribute to overall satisfaction of library users?
ii. What factors shape users' perceptions on quality services?

II. LITERATURE REVIEW

2.1 Theoretical Review

The ServQual framework was used in this study because of its worldwide efficacy in assessing service quality. ServQual, which was created by Parasuraman *et al.*, (1988), it measures the discrepancy between user expectations and perceptions in order to determine the quality of a service. It focuses on five main elements, which can be summed up as follows: Assurance (staff trust and confidence), Empathy (individualized attention), Responsiveness (timely support), Reliability (constant and correct service delivery), and Tangibles (physical facilities and personnel appearance). When real service meets or exceeds expectations, it is considered high-quality service.

Because it highlights user perceptions, finds gaps in service delivery, and establishes a direct correlation between service quality and user pleasure, the ServQual model is frequently used. It is versatile and adjustable to library settings, enabling organizations to evaluate not only conventional services but also digital resources, librarian knowledge, and information accessibility. It is a useful tool for continual improvement since it also makes benchmarking between institutions or over time possible.

2.2 Empirical Review

An empirical review evaluates previous studies that observed at a topic using actual data. Golder *et al.*, (2023) orated that empirical review emphasizes what was investigated, how it was investigated, and the results summarizing the available data, pointing out research gaps and trends, and demonstrating how the present study expands on earlier findings. Empirical reviews, as opposed to theoretical reviews, are based on real study findings rather than theoretical ideas Pandey, (2024). Based on the two specific objective of this study empirical literature review is presented as follows.

2.2.1 The Extent to which the Library Services Influences Library Users' Level of Satisfaction

The degree to which library services affect users' satisfaction in academic libraries has been the subject of investigations. The results typically indicate that the main factors influencing user satisfaction are the quality, availability, and sufficiency of library services. In a study on Tanzanian university libraries, Mbua, (2025) discovered that the accessibility of ICT resources, the effectiveness of librarians, and the availability of current information resources have major impact on user satisfaction. The study found that library users are less satisfied when services are delivered slowly and with inadequate infrastructure. Similarly, Alam and Mezbah-ul-Islam, (2021) found that user-oriented services, efficient communication, and prompt service delivery have a high positive correlation with satisfaction among Bangladeshi university students.

A related study by Okello-Obura and Ikoja-Odongo (2019) examined the quality of library services in East African institutions and found that aspects including assurance, responsiveness, tangibility, and reliability have a direct

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impact on user satisfaction. According to the survey, patron satisfaction was higher in libraries that integrated ICT services and had longer hours.

Additionally, Kaishe-Mulungu, *et al.*, (2024) looked at how Library service provision including digital resources enhance users' satisfaction in Tanzania university libraries. The results showed that having access to up-to-date digital repositories, online databases, and e-resources greatly increases user satisfaction, especially for postgraduate, lecturers and researchers' users. On the other hand, variables that negatively impact user experience were found to include noise, unstable power supply, inadequate photocopying services, low bandwidth and lack of air conditioning. Similarly, Devi and Bhatt, (2024) discovered that regular feedback mechanisms and user involvement in library service planning enhanced the perceived quality of library services and, in turn, satisfaction level.

Over all empirical studies revealed that, user satisfaction is largely determined by the quality of library services, library collection, library as a place, librarians' knowledge and skills as well as library facilities including the accessibility of relevant information resources, ICT adoption, staff response, and physical facilities. As a result, improving user experiences at academic institutions requires ongoing evaluation and enhancement of library service quality. The services, facilities, staff efficiency, and manners all of which address the information demands of library users have a direct impact on how satisfied library users are. According to Bamkin (2020) on analysis of academic libraries' collection development, space planning, futuristic technologies, and information services, the library of the future will serve as a knowledge refinery and visually pleasing and emotionally charged social hub.

Therefore, it is undeniable that user's satisfaction with the library's space, collection, services, personnel, and facilities has a substantial impact on how often users use the resources provided and how well their needs are met. User satisfaction in the library serves as a vital indicator of service quality in library setting (Aminu & Trivedi, 2022). However, failure to provide the required quality of services could lead to dissatisfaction. Given the significant responsibilities of library staff in provision of services, it is crucial for every university library to enhance the skills and knowledge of its librarian workforce (Saragih *et al*., 2021). While many library users have demonstrated the impact of library services on their satisfaction, there are still questions about the specific services that should be offered to meet users' needs. Therefore, this study aims to determine the extent to which library services influence user satisfaction levels by using a five-point Likert scale to evaluate various services provided by the university libraries, focusing on library facilities, services, librarians, collection and place.

Library Services: Based on library services, libraries offer a broad range of services to satisfy its users. These include interlibrary loan, online book reservations, circulation, reference, photocopying and printing, orientation, workshops, current awareness services, selective information distribution, audiovisual facilities, and even refreshments. With at least two libraries at each of the 30 public and private colleges in the nation, attempts are underway to expand access to online resources by integrating contemporary technology and internet connectivity (United Republic of Tanzania [URT], 2022; Mushi *et al*., 2023).

University libraries' main responsibility is to gather, arrange, and make learning materials in a variety of formats accessible. In order to improve accessibility and facilitate teaching and research, services are increasingly being provided via online platforms like Net Library, institutional repositories, and integrated library systems (Mbughuni *et al.*, 2022). Digital resources, including e-books and e-learning platforms, have become central in ensuring that students and staff can easily access updated academic materials.

Due to the availability of resources from publishers, online bookstores, databases, and the internet, libraries no longer have a monopoly on information on a global scale (Mahmood *et al.*, 2021). University libraries are forced by this competition to embrace cutting-edge technological strategies in order to be valued, visible, and relevant to their patrons. Libraries can fulfill changing academic needs and preserve user happiness by adopting digital services and user-centered procedures (Ofori *et al.*, 2020).

Research conducted in Tanzania shows successes and difficulties in guaranteeing user satisfaction. Even if a large number of customers are happy with the services and collections offered, problems including bad shelving arrangements, insufficient security, and subpar customer service continue to be obstacles (Khan et al., 2019). Specifically, poor security erodes patron confidence and deters patronage of libraries (Saragih *et al.*, 2021). In order to promote trust, strengthen the library's reputation, and guarantee a secure, friendly learning environment, increasing customer satisfaction necessitates ongoing development, employee training, and operational changes (Nzewi, 2023; Albrecht, 2023).

Library as a place: With library as a place, the idea of the library as a location highlights that libraries are social, cultural, and educational spaces where users can establish a feeling of community in addition to being informational centers (Hamilton-Nixon, 2019; Dameria *et al.*, 2020). By connecting individual values and perceptions to place identity, attachment, and dependency, this viewpoint emphasizes the cognitive, emotional, and psychomotor aspects of user experiences. User pleasure and engagement are greatly impacted by the layout and organization of libraries, including study spaces, digital resources, and physical design (Riratanaphong, 2024).

Upgrades to libraries' study areas, book collections, and technology infrastructure are essential for raising customer happiness and service quality. While personnel and cultural events create the library's human and service

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dimensions, amenities like meeting rooms, cafes, exhibition spaces, and digital access enhance the whole library experience. Kim (2018) emphasizes that user perceptions have a critical role in directing the expansion, refurbishment, and design of libraries. However, studies reveal that many academic libraries have issues that negatively impact user views, such as inadequate space, bad ventilation, inadequate electricity, a lack of ICT equipment, and unprofessional staff behavior.

Users nevertheless value library services, especially circulation and resource access, in spite of these obstacles, suggesting that libraries continue to play a crucial role in academic engagement. Stakeholders must extend ICT-based services, improve librarian-user relations through training, and upgrade infrastructure in order to increase satisfaction. Positive opinions of libraries as professional and user-friendly locations are also influenced by the creation of well-kept, tidy, and ordered facilities (Kim, 2018; Kim & Yang, 2022). Fostering conducive learning environments requires a number of factors, including natural lighting, comfortable sitting, quiet study spaces, and access to print and online materials.

Convenience and accessibility play equal roles in determining the library experience. Broader usability is ensured by extended hours, adaptable study areas for both solo and group study sessions, and dependable internet connectivity. Emotional ties to a library's academic significance, history, or architecture boost patron happiness and loyalty, and libraries are frequently seen as intellectual icons (Cox, 2023). By offering individualized support and direction, helpful employees further improve this reputation. Because it has a direct impact on the caliber of library services and patron pleasure, it is crucial to comprehend how patrons view the library as a place.

Library collection: Library collection refers to all learning resources available in the library, the process of collection development involves methodical selection, procurement, and dissemination of a wide range of information materials that users need. In line with the institution's vision, mission, and academic programs, this includes books, licensed databases, audiobooks, movies, and digital resources (Mwilongo *et al.*, 2020). Whether in print or electronic formats, a well-structured collection guarantees that resources satisfy the learning and research goals of staff and students and directly increases user satisfaction by offering pertinent and easily available materials.

The quality and accessibility of library collections are directly related to user satisfaction. Research has demonstrated that both teachers and students appreciate collections, but it also emphasizes how crucial it is to include administrators and professors in collection construction (Mahmood *et al.*, 2021). Higher satisfaction levels are reported by libraries that maintain friendly, multipurpose spaces and incorporate user demands into their rules. In addition to collections, other elements that influence the overall library experience include physical space, technology, and chances for social interaction.

By offering current, specialized, and multidisciplinary resources, strong library collections promote academic support, research, and innovation (Bachynska *et al.*, 2024). Additionally, by ongoing assessment and modification, effective collection development guarantees sustainability, enhances institutional reputation, and enables accreditation (Oguntuase *et al.*, 2024). Well-organized collections facilitate long-term preservation through archiving and digitization, enhance interaction, and make resource finding easier. Libraries continue to be vital to academic advancement by incorporating digital technologies, personalized services, and the preservation of rare resources.

Librarians: Professionals who work in libraries, librarians offer patrons technical or social programming as well as information services. Antonia *et al. (*2024) opined that librarian in universities are of two categories: academic and non-academic, belonging to either of the categories has implication as employee's role, duties, status and career progressions in the academic setting. Their tasks, responsibilities, prestige, and career advancements in academic contexts are critical, and they might be either academic or non-academic (Donkor et al., 2024). Librarians provide services by being attentive, quick to respond, and adept at solving problems. By building relationships, selecting efficient information access options, and assessing academic landscapes, they can increase user satisfaction.

They should be actively engaging with academic environment and anticipating user needs, rather than passively waiting for requests for specific services. Oguntuase *et al.* (2024) opined that librarians are tasked with nurturing and enhancing relationships with faculty, researchers, and students, ensuring that the services provided are in alignment with the institution's academic objectives and priorities. In the selection of information access solutions, including databases, journals, and other resources, librarians are urged to evaluate cost and effectiveness of these options. This necessitates a careful balance between budget limitations and the provision of high-quality academic resources, thereby ensuring sustainability while promoting academic excellence (Tribelhorn, & Young, 2022). To remain responsive and essential in furthering academic goals, librarians must constantly evaluate the academic environment while keeping abreast of research trends, instructional strategies, technology, and information access.

According to Bachynska *et al.*,2024; Donkor, *et al.*, 2024 on their studies observes that, librarians are essential to academic work because they give users access to high-quality learning materials, encourage critical thinking, teach them how to manage resources, conduct research, provide specialized subject knowledge, create customized resources, and keep ICTs up to date for efficient library operations.

Librarians are the key actors in developing collection that meets the needs of users by ensuring budget optimization, cooperate with faculty members and other professional communities and influence policies and other cross

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cutting issues within the community based on goals and mission of the university thus ensures the library remains a central pillar of the university in the academic infrastructure and contribute in meeting accreditation standards by enhancing university good image and driving innovations (Antonia *et al.*, 2024).

Professionals in charge of providing information services and assisting academic communities in universities are librarians. Their tasks, responsibilities, and career advancement are influenced by their classification as academic or non-academic staff (Antonia *et al.*, 2024). Their efficacy hinges on attributes including expertise, reliability, responsiveness, and problem-solving skills, all of which have a big impact on customer satisfaction. According to research, librarians have a crucial role in promoting user-centered services because of their attitudes and interactions with patrons, which directly affect how the library is viewed.

In order to anticipate and meet user demands, modern librarians must actively interact with academics, researchers, and students. In order to ensure sustainability and academic success, they must use information resources that strike a compromise between cost and quality (Oguntuase *et al.*, 2024; Tribelhorn & Young, 2022). To stay responsive and flexible, librarians must continuously evaluate teaching strategies, academic trends, and technology developments. Librarians actively contribute to the advancement of institutional missions through creative service design, strategic partnerships, and effective resource management.

According to studies, librarians promote academic work by making sure that students have access to high-quality resources, encouraging critical thinking, teaching research techniques, maintaining databases and library systems, and giving individualized assistance (Bachynska *et al.*, 2024; Donkor *et al.*, 2024). Their duties include upholding academic integrity, carrying out research, gaining subject-matter expertise, and modernizing ICT tools to enhance library operations. By doing this, they improve educational opportunities and provide easy access to print and digital resources. In order to ensure conformity with institutional goals and accrediting criteria, librarians also play a crucial role in budget optimization, policy impact, and collection development (Antonia *et al.*, 2024). In addition to knowledgeable librarians, library infrastructure has a significant impact on how users interact with the institution. In order to improve resource availability, encourage cooperation, and establish a friendly learning environment for both staff and students, modern libraries are increasingly being developed with flexible, technologically advanced spaces, such as multimedia labs, electrical, computer terminals, and sustainable study areas (Miao *et al.*, 2024).

Library facilities: University library facilities comprise all of the technological, service, and physical infrastructures that contribute to a library environment which is favorable for learning, research and teaching. Their sufficiency, availability, and up to date have a direct impact on the quality of library services rendered and users' satisfaction. Studies shows difference between the expectations of library users and the perceived quality of services rendered. For instance, Simba's (2021) investigation of the University of Iringa library revealed that the magnitude of the gap varied depending on individual services given from library and that there was a gap between user's expectations and perceptions of service quality.

Furthermore, in Tanzanian academic libraries, technology resources and infrastructure are often important facilities that influence users' satisfaction. According to Kaishe-Mulungu and Lwehabura (2025) in their study found out that; unreliable ICT infrastructure hinders library service delivery and user satisfaction. They also claim that the use of (ICTs) resources in developing countries like Tanzania faces significant challenges. This is in line with other research that demonstrate how user views the library use are adversely affected by a lack of enough computer infrastructures, poor internet connectivity, and poor physical comforts such as reading space, lighting, and ventilation. Mulalike (2015) identified insufficient number of computers with internet connectivity and reading space compared to number of users as one of the main obstacles to user satisfaction.

Lastly, the empirical literature highlights a crucial detail: facilities' existence alone does not guarantee user satisfaction rather they also need to be functional, accessible, and in line with user needs. Mubofu (2023) observed that although users are satisfied with overall quality of the library services, the rates of satisfaction do not meet the maximum scale in the context of Tanzanian university libraries. This points to a situation where potential is unrealized yet satisfaction is moderate. Additionally, Simba (2021) noted that, from the standpoint of the user, electronic journals, photocopying, interlibrary loan, and the library webpage were some of the most troublesome services. For Tanzanian academic libraries to successfully improve their facilities, integrative techniques combining physical space, ICT infrastructure, staff support, and user-oriented service design are necessary.

2.2.2 How Library Users, Perceive their Satisfaction with the Quality of Library Services.

Several empirical studies have observed at how satisfied library users are with the quality of services provided, exposing a range of variables that affect users' experiences in general. Service quality models like SERVQUAL, LibQUAL+, and E-S-QUAL, which gauge perceptions along dimensions including tangibility, assurance, responsiveness, empathy, and dependability, have been widely used to measure user satisfaction (Parasuraman *et al.*, 1988). Several research assessing users' expectations and perceptions of service delivery in academic library environments have been guided by these frameworks.

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Owusu-Ansah (2024) in her investigation on the moderating influence of library size on the relationship between library space attributes and learning satisfaction, found that users of Ghanaian university libraries were somewhat satisfied with the services provided by the library, especially with regard to the availability of learning spaces and the helpfulness of the librarians. However, issues like access to up to date resources and ICT resources caused discontent. Similarly, Akande (2023) discovered that while librarians in Nigeria showed positive opinions toward users, user satisfaction was greatly lowered by bad infrastructure, slow internet access, and constrained hours. These results imply that the availability of current resources and the provision of human services are directly related to users' perceptions of satisfaction.

Empirical research suggests comparable tendencies in East Africa. Users were generally satisfied with librarians' competency and information literacy training, but they were less content with seating capacity, ventilation, and electronic resources, according to a study conducted by Ilako, *et al.* (2025) in Ugandan universities. Malik *et al.*, (2024) looked at academic library services in libraries and discovered that while users appreciated the availability of print materials and staff support, they continued to be dissatisfied with the insufficient study areas, noise levels, and digital resource access. Together, these studies show that in developing-nation settings, user happiness is significantly influenced by the standard of library infrastructure, staff-user interactions, and availability of contemporary information technology.

Important insights are also provided by research conducted outside of Africa. For example, Khan and Bhatti (2020) in Pakistan discovered that the attitude of library employees, the quality of online databases, and the convenience of access to information all had a significant impact on the satisfaction of library customers. According to Akande (2023), users at Nigerian institutions expressed satisfaction with the library's capacity to adjust to their evolving digital needs in addition to the quality of services provided. These results highlight how user-cantered service design and ICT integration are becoming increasingly important in influencing patron satisfaction in contemporary academic libraries.

Overall, empirical data shows that library users' satisfaction is multifaceted and includes both concrete and abstract elements of service quality. When libraries offer dependable physical and digital information resources, well-maintained, easily accessible facilities, and polite, attentive personnel, library users are more likely to be satisfied. On the other hand, poor infrastructure, scarce resources, and insufficient technical assistance frequently lead to dissatisfaction. In order to improve service delivery and make sure that libraries continue to be responsive to changing academic and informational needs, it is crucial to analyze users' feelings of satisfaction.

2.2.3 Perception on the Quality of Library Services among Library Users

The quality of collections, accessibility, technology infrastructure, study space, librarian expertise, and the library's prominence in national and international forums are some of the elements that influence how users perceive and understand a university library's services and environment (Kiriri, 2018). Positive opinions are largely shaped by current collections that are in line with academic programs and international standards, as well as knowledgeable librarians who encourage information literacy, critical thinking, and resource organizing (Chandrakar, 2024). Convenience and accessibility are also important factors in user happiness. Libraries are supposed to offer suitable learning environments, flexible operating hours, and cozy study areas (Saragih *et al.*, 2021). Digital resources, maker spaces, and virtual reference services are examples of technological infrastructure that improves user impressions and presents libraries as creative and progressive (Mushi *et al.*, 2023).

While collaborative spaces and international alliances enhance institutional reputation, a user-entered approach that incorporates feedback, friendly policies, and active interaction with academic communities further improves how libraries are seen (Ojei & Popoola, 2023). Research indicates that dependable services, well-designed buildings, and high-quality collections have a beneficial impact on impressions (Molson, 2022). User participation in the selection of materials, better reference services, handy locations, and subject-matter competence of librarians are all elements that contribute to increased satisfaction. Users' trust and enjoyment of the library increase when their needs and expectations are regularly satisfied, which supports the institution's academic mission and stellar reputation.

Universities must establish criteria for high-quality library services that facilitate academic activities in order to improve users' perspectives (Antonia *et al.*, 2024). Relevance and efficiency are guaranteed by appropriate resource allocation, data-driven decision-making, and effective collection development policies. In the end, extensive holdings and cutting-edge services not only raise users' satisfaction but also support academic reputation, university accreditation, and global ranking, establishing the library as an essential center for study and research.

III. METHODOLOGY

The study was carried out in Tanzanian universities libraries with primary data collected between September 2022 and August 2023 with mixed approach both qualitative and quantitative (Tashakkori, & Teddlie, 2008). It employed a cross-sectional research design, which involved collecting data at a single point in time. This design saves time and resource which are limited (Merriam & Tisdell, 2015). In a cross-sectional study, the researcher assesses both

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the outcome and the exposures in the study participants simultaneously. The selection of participants in such a study is based solely on the predetermined inclusion and exclusion criteria. Cross-sectional studies are also recognized for their relatively swift execution and cost-effectiveness.

The study was carried out in five selected Universities in Tanzania, namely University of Dar-es-Salaam (UDSM), the University of Dodoma (UDOM) and St. Augustine University (SAUT) on Tanzania Mainland and the State University of Zanzibar (SUZA) and Zanzibar University (ZU) in Tanzania Islands. These five universities were selected purposefully because most of them are old enough in terms of experience, resources, services offered and its libraries and infrastructure. St. Augustine University (SAUT) and Zanzibar University (ZU) were privately owned while University of Dar-es-Salaam (UDSM), the University of Dodoma (UDOM) and State university of Zanzibar were government owned. All universities are rendering services which differs in one way or another. However, they are regulated by Tanzania Commission for Universities (TCU) and was accredited as per regulatory authority. It was therefore considered that the universities under study were applicable to give the required and adequate information under the study.

The population of this study was members of academic staff, students, heads of higher learning institutions, Directors of Libraries, quality assurance officials, Heads of Departments in the libraries and library staff amounting to 64,988 (Table 1). In addition, 68 respondents were selected purposely because they thought to provide important information related to the positions they held in their institutions that could enriching the research findings. These groups were chosen because they were considered as potential for providing relevant information and answers for the study. The unit of analysis was the university's academic staff and students who were selected by using purposive sampling techniques and systematic random Sampling techniques as explained in (Kothari, 2014).

Table 1

Population of the Study

Name of University	Category	Number of Participants
UDSM	Staff	1,538
	Students	28,625
UDOM	Staff	867
	Students	16398
SAUT	Staff	434
	Students	10, 957
SUZA	Staff	230
	Students	3,984
ZU	Staff	93
	Students	1,995
	Total	**64,988**

Source: TCU, 2024

Respondents in this study were selected by using both probability and non-probability sampling techniques. Probability sampling techniques used were systematic random sampling while non-probability sampling was purposive sampling techniques. Purposively technique was used to select five universities of this study whereas systematic random sampling was used to obtain respondents of the population at regular intervals every after the 20th respondent on a list of the population.

The study had 68 key informant respondents of which Heads of university administrators were (20), Directors of libraries (5), Heads of Library Departments (20), Heads of Quality Assurance Units (5), Heads of Finance (5), heads of ICT units (5), and Building and Estate Managers (8). The key informants were selected purposely because they were thought to be well knowledgeable and with the required expertise in their respective areas of specialization. The total population was 64,988 (see table 1). The purpose of the study was to determine how satisfied library users of Tanzanian university libraries were with the quality of library services.

Table 2 below shows the sample size of the study with precision level of + or – 5. The Sample Size Determination Table created by Israel (1992) was used to establish the sample size in order to guarantee that the chosen sample accurately represented the target population. For different demographic ranges, this table offers suitable sample sizes at predetermined precision rates and confidence levels. In order to determine a representative sample size that would produce accurate and broadly applicable results about users' satisfaction with library services, the researcher first determined the entire population of possible library users and then consulted Israel's table. The sample size was obtained by using Sample Size Determination Table by Israel (1992) which state that; if the total population is between 50,000 to 100,000 the sample shall be 397 respondents. (See Table 2). So, since the total population was 64,988 then the ideal sample size should be 397

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Table 2
The Sample Size of the Study

	Precision level	**Precision level**	**Precision level**	**Precision level**
Population	±3%	±5%	±7%	±10%
15,000	1034	390	201	99
20,000	1053	392	204	100
25,000	1064	394	204	100
50,000	**1087**	**397**	**204**	**100**
100,000	1099	398	204	100
≥100,000	1111	400	204	100

Source: Israel (2003) Israel Sample Size Determination Table Sample size for ±3%, ±5%, ±7% and ±10% Precision Levels Where Confidence Level is 95% and P=.5

Table 3 below shows the sampling frame which indicate how many respondents were selected from each university. The respondents were selected by using a formula =Number of Participants/total population*sample size= number of respondents in each university categories of staff and students in each particular university.

Table 3
Sampling Frame

Name of University	**Category**	**Number of Participants**
UDSM	Staff	9
	Students	175
UDOM	Staff	5
	Students	100
SAUT	Staff	3
	Students	67
SUZA	Staff	1
	Students	24
ZU	Staff	1
	Students	12
	Total	**397**

Source: TCU, 2024

The primary data for the study were collected using questionnaire and interviews. Questionnaires with closed and open-ended questions were administered to the unity of analysis category which was students and university staff. Questions were set based on constructs extracted from the conceptual framework and specific objectives of the study. Questions required respondents to select answers from the list provided and Likert scale questions to rate numbers in matching statements. Other questions required respondents to explain, and express their views or opinion on related matters in each section. The questions focused on the main and specific objectives of this study. Questions were distributed to each specific group. Open questions were used because they allowed respondents to express their views independently and hence reduce biases and subjectivity. However, questionnaire was pretested before being administered to the respondents. The results obtained were 0.72 that means the instrument were reliable.

The interview is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program or situation. In this study, interviews were administered to the key informants who were 68 participants. Quantitative data were analysed by using SPSS software where descriptive data analysed. The results were presented in the form of tables and figures indicating frequencies, percentages. Content analysis was used to analyse qualitative data gathered from key informants and open-ended questions obtained from the unity of analysis which was the respondents. The researcher collected the information with the related ideas from open-ended questions and interviews.

IV. FINDINGS & DISCUSSION

4.1 The Extent to Which Users are Satisfied with Library Collection

The respondents were asked to indicate how they perceive Library collection on a 5-point likert scale where SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree and; SD=Strongly Disagree. 33.8% indicated that they find library collection books in their programs sufficiently in their library, 31% were satisfied with collection of theses & dissertations in their discipline are sufficient in this library, 30% find Journals, newspapers, magazines & printed

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resources sufficient, 28.3% reported that they find the library having extensive subscribed databases and e-learning resources, 23% find e-resources portals easy to access, informative and easy to navigate, 20.6% find the library to provide sufficient CD, DVD, VHS, photos & other digital resources (Table 4).

However, 21.6% disagreed that they find the library to provide sufficient CD, DVD, VHS, photos & other digital resources. These results are contrary to a study done by Elias and Lubua (2024) who indicated that the library contained e-resources organized by their college libraries were proprietary online e-resources, Open-source online e-resources, Off-line database and CD/DVD collection. Interviews with staff from quality assurance unit (key informants) had this to comment on how they perceive Library collection.

> *"Librarians are doing their work professionally; the problem is the number of library users at once which makes them seem less efficient.* Dodoma and Dar es salaam Universities (2023).
>
> *"Most of library staff are competent with ICT technology therefore they perceive that library provide services they wanted."* Zanzibar University (2023).

Table 4

Library Collection as Perceived by Library Users

Statement	SA		A		N		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
I find Journals, newspapers, magazines & printed resources Sufficient	119	30	112	28	114	29	46	11.6	6	1.5	397	100
Satisfying collection of theses & dissertations in my discipline are sufficient in this library	123	31	112	28	115	29	44	11	3	0.6	397	100
I find library collection books in my programs sufficient in this library	134	33.8	105	26	114	28.8	38	9.6	5	1.2	397	100
I find records of the collection are kept consistent with actual holding/status in this library	103	26.0	112	28.1	139	35	39	9.8	3	0.6	397	100
I find this library has extensive subscribed databases and e-learning resources	113	28.3	105	26.4	121	30.4	50	12.4	9	2.1	397	100
I find this library to provide sufficient CD, DVD, VHS, photos & other digital resources	82	20.6	81	20.4	138	34.8	86	21.6	9	2.3	397	100
I find e-resources portals are easy to access, informative & easy to navigate in this library	94	23	120	30.3	120	30.3	63	16	3	0.6	397	100

4.2 The Extent to Which Users are Satisfied with Library Services

The respondents were asked to indicate how they perceive library services. The results show that 38% reported that a good library provides users with advisory services to assist them to use the collection efficiently, 35% reported that a good library provides interlibrary loans request thoroughly and promptly, 34% said that in an efficient library, library books are re-shelved promptly and are neat free from dust. Additionally, 30.2% indicated that timely library opening hours meets their time table needs, 29 % indicated that an information-rich library, online catalogue e-portal is easy to use and to learn how to use it, and 28.7% said that an information-rich library website is easy to access, impressive looking, informative and easy to navigate. However, 13% disagreed that a good library provides reservation/booking services. These results are similar to study done by Bamkin (2020) who indicated that the participants identified the benefits of interlibrary lending and generally acknowledged that resource-sharing was important. However, interviews with staff (key informants) commented that most students are satisfied with services rendered by their library, however some of them were not satisfied with the library services categorically in availability of computers and most of them are restricted for typing, inserting external gadgets they are just there for catalogue access only, so they perceive library service as not satisfactorily at all

4.3 The Extent to Which Users are Satisfied with Library as a Place

The respondents were asked to indicate how they perceive and satisfied by library as a place and services provided. 47.9% of the respondent indicated that the seating arrangement of the library is attractive, 38.9% cleanliness of the library and its conducive environment enhance learning, 33.8% library as a place provides sufficient cloakrooms/lockers, 37.4% lighting of the library building is conducive, 36.6% library is comfortable, clean and well lighted with clean air, 33.8% library as a place provides sufficient cloakrooms/lockers. Furthermore, 30.5% library as a place provides reliable wireless connections to the internet, 30.5% library as a place provides reliable wireless connections to the internet, 30.3% directional and warning sign, emergence doors/windows in case of fire alarm 29.4%.

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Library as a place provides sufficient computer workstation for users, 29% library place provides sufficient book borrowing and returning kiosks, 28.8% library provides timely and clear information about equipment which is not working and 28% library reference services (Current awareness Services and Selective Dissemination of Information). This result shows that most users strongly agree with the service provided in the library as a place. However other users disagree with the service provided for example 20.8% of users disagree that the library offers enough secretarial services, 13.9% think the sitting arrangement is attractive, and 11.8% think there are enough book borrowing and return kiosks. These findings are consistent with research by Kekana and Kheswa (2020), which found that students' opinions of the services they received at (CRM) Cecil Renaud Main library were less favourable than what they had anticipated. Interviews with directors (key informants) had this to comment on how they perceive Library as a place **(See table 10).**

> *"Most of Library users perceive library as a place not conducive for having discuss and others are complained that the atmospheric condition is not pleasant for study. "Dodoma University and University of Dar es salaam (2023).*
>
> *"Most of library users requesting that the library should have a coffee shop and soft drinks" Zanzibar University and State university of Zanzibar (2023).*

4.4 The Extent to Which Users are Satisfied with Library Staff

The respondents were asked to indicate how they perceive library staff on the services provided in the library. 40% indicated that library staff are approachable, polite, friendly and empathetic, 35% library staff are available to respond timely and in humble manner, 29.9% indicated that library staff were competent in professionalism, 28.9% were of the view that library staff makes relevant information about its services available, 28% library staff provide printed or electronic resource guidance, 27.5% the behaviour of the library staff were impressive, 27% library staff are competent in communication while 26.7% said library staff provide sufficient library user education. However, 14.1% of the respondents disagreed that the behaviour of the Library Staff is impressive**.** This result corresponds to findings from a study by Ojei and Popoola (2023) who indicated that the library staff delivers the library services with positive attitude, prompt and are always ready to respond to users' query, assurance, access, good communications skills and empathy, Library staff positively influences the users' access to effective library services. However, interviews with staff from quality assurance unit (key informants) commented on how they perceive library staff on services provision **(See table 7).**

> *"Most of library staff perform their duties properly but they complain that they have so many costumers to serve at one time therefore they find themselves exhausted with duties.* Dodoma University (2023).
>
> *"Most of library staff are competent with ICT technology therefore they library users perceive the library to be providing services they wanted."* Zanzibar University (2023).

4.5 The Extent to Which Users are Satisfied with Library Facilities

Respondents were asked to give their views during in depth interview on to what extent they are satisfied with library facilities; they had differing perspectives about how satisfied they were with the facilities available to their libraries. According to a significant percentage of respondents, their libraries offer enough reading areas, convenient seating, enough lighting, and an all-around tidy and orderly setting that is ideal for research and study. Access to information resources was also emphasized as being improved by the availability of necessary facilities including computers, internet access, and photocopying services. Other patrons, however, complained about the lack of computer terminals, low ventilation, crowded study areas during busy times, and poor upkeep of the library's furnishings and equipment.

Some respondents also mentioned that the library's atmosphere was less conducive due to noise, a lack of group study spaces, and uncomfortable hot tropical climatic condition while air conditioning and fans were not working in some areas. Interviews with library directors (key informants) had this to say in relation factors that the level of satisfaction of library services,

> *"Library users were not satisfied with overcrowding and hot climatic condition, lack of chairs, and early closing time especially during university preparation weeks which negatively affects concentration of their studies given the fact that most of them are staying off campuses."* University of Dar es salaam, (key informant 3, 2023).

These results are in line with earlier research, like that of (Simba 2021; Omar, 2023 and Mubofu, 2025), which found that user satisfaction in Tanzanian university libraries is highly influenced by the availability and state of library facilities. Overall, the degree of satisfaction with library facilities is mostly determined by its sufficiency, usefulness, accessibility, and upkeep, all of which together impact how comfortable and productive the learning environment is.

4.6 Extent to Which the Library Services Influence Library Users' Level of Satisfaction

The respondents were asked to indicate to what extent library services influences users' level of satisfaction based on time, accessibility and time spent to reach library and the results are indicated in table 5. These results show

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that 61.2% indicated that time provided for using the library is adequate for users, 58.7% indicated that they access library any time they need and 54.6% indicated users who may want to come to the library but are not able because of distance.

Table 5

Extent to which the Library Services Influences Library Users' Level of Satisfaction

Extent to which the library services influences library users' level of satisfaction	F	%
Access library any time they need.	233	58.7
Time provided for using the library is adequate for users	243	61.2
Users are not able to use the because of distance	217	54.6

These results show that the majority of users are using the library adequately once the library was open. This implies that libraries are open at the required time and the staff are there to provide the students with the services they needed. Therefore, the library management should make sure that the library is open on time and skilled staff are available to give services and provide the required assistance to users. The findings are similar to those from the study done by Nzewi (2023) who found out that library staff through their professional skill are able to guide and support student get the needed information resource to achieve their educational goal.

Interviews with library directors (key informants) had this to say in relation to the extent library services influence users' level of satisfaction;

> *"Library users are satisfied with the availability of learning resources both print and online but the frequent electricity cut off is affecting its effectiveness, efficient careful use of our library facility."* St. Augustine and Dodoma University, (key informant 1, 2023).
>
> *"Most of students reported that they are not satisfy with the library because it does not have enough computers and most of them use their own electronic gadgets to brows online resources which is difficult as there are no enough charging sources" State University of Zanzibar and Zanzibar university, (key informant 2, 2023).*

To ascertain the factors that influenced the level of satisfaction of library services, a binary logistic regression model was used. The results are presented in Table 6.

Table 6

Factors Influencing the User Satisfaction Level of Library Services

Variable	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Lack of relevant resource	.447	.238	3.526	1	.060	1.563	.981	2.492
Noise	-.526	.260	4.106	1	.043*	.591	.355	.983
impoliteness	-.013	.328	.002	1	.968	.987	.519	1.878
No computers	.005	.243	.000	1	.985	1.005	.624	1.617
bad photocopy	-.620	.276	5.052	1	.025*	.538	.313	.924
Lack of air conditioners	.684	.288	5.628	1	.018*	1.982	1.126	3.488
Lack wireless connectivity	.363	.256	2.010	1	.156	1.437	.870	2.372
Poor toilets	.391	.282	1.931	1	.165	1.479	.852	2.569
congestion	.437	.271	2.596	1	.107	1.547	.910	2.631
lack enough staff	.466	.273	2.918	1	.088	1.594	.934	2.720
lack printing services	-.154	.247	.389	1	.533	.857	.528	1.391
lack weekend services	-.579	.287	4.070	1	.044*	.560	.319	.984
early closing time	.781	.349	5.020	1	.025*	2.184	1.103	4.326
Constant	-1.441	.563	6.541	1	.011	.237		

Note: * Statistically significant at 5% level of significance

Results from binary logistic regression indicate that several factors had a statistically significance influence on the user satisfaction with library services. Among them with their corresponding probabilities are noise (p = 0.043), bad photocopy (p= 0.025), lack of air conditioners (p=0.018), lack weekend services (p=0.044), early closing time (p=0.025).

Interviews with library directors (key informants) had this to say in relation factors that the level of satisfaction of library services,

> *"Library users were not satisfied with overcrowding and hot climatic condition, lack of chairs, and early closing time especially during university preparation weeks which negatively affects concentration of their studies given the fact that most of them are staying off campuses."* University of Dar es salaam, (key informant 3, 2023).

Library Users' Satisfaction with the Quality of Library Services Perception to library staff

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Table 7 presents respondents' perceptions of library staff competence, professionalism, and user interaction quality

Table 7

Library Staff as Perceived by Library Users

Statement	SA		A		N		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Library staff are approachable, polite, friendly and empathetic	158	40	93	23.4	99	24.8	29.9	7.5	0.9	0.2	397	100
Library staff makes relevant information about its services available	137	35	106	26.6	98	24.7	38.4	9.7	17.1	4.3	397	100
Library staff are competent in the communication	108	27	91	23	116	29.2	32.4	8.2	14.5	3.7	397	100
Library staff provide sufficient library user education	106	26.7	90	22.6	110.9	27.9	42.7	10.7	13.6	3.4	397	100
Library staff provide printed or electronic resource guidance	113	28	91	23.	127	31.9	52	13	13.4	3.4	397	100
Library staff makes relevant information about its services available	115	28.9	114	28.7	107	26.9	52	13	11	2.7	397	100
Library staff competence in professionalism	119	29.9	100	25.2	122	30.7	42	10.5	2	0.5	397	96.8
The behaviour of the Library Staff is impressive	109	27.5	113	28.4	117	29.4	56	14.1	2	0.5	397	99.8

Table 8 summarizes how library users perceive the effectiveness, accessibility, and reliability of various library services.

Table 8

Library Services as Perceived by Library Users

Statement	SA		A		N		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
An information-rich library website is easy to access, impressive looking, informative and easy to navigate	114	28.7	122	30.7	111	27.9	50	13	1	0.2	397	100
Timely library opening hours meet my time table needs	120	30.2	88	22	107	27	44	11	2	0.5	397	100
An information-rich library online catalog e-portal is easy to use and to learn how to use	117	29	102	25.6	108	27	41	10	3	0.6	397	100
A good library provides reservation/booking services	108	27	98	25	118	30	51	13	3	0.8	397	100
A good library provides interlibrary loans request thoroughly and promptly	140	35	78	20	131	33	47	12	0.8	0.2	397	100
In an efficient library books are re-shelved promptly and are neat free from dust	136	34	116	29	114	29	28	7	3	0.6	397	100
A good library provides users advisory services to assist them to use the collection efficiently	150	38	95	24	118	30	31	7.8	3	0.6	397	100

Table 9 presents respondents' perceptions of library collections and electronic resources.

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Table 9

Library Collection as Perceived by Library Users

Statement	SA		A		N		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
I find Journals, newspapers, magazines & printed resources Sufficient	119	30	112	28	114	29	46	11.6	6	1.5	397	100
Satisfying collection of theses & dissertations in my discipline are sufficient in this library	123	31	112	28	115	29	44	11	3	0.6	397	100
I find library collection books in my programs sufficient in this library	134	33.8	105	26	114	28.8	38	9.6	5	1.2	397	100
I find records of the collection are kept consistent with actual holding/status in this library	103	26.0	112	28.1	139	35	39	9.8	3	0.6	397	100
I find this library has extensive subscribed databases and e-learning resources	113	28.3	105	26.4	121	30.4	50	12.4	9	2.1	397	100
I find this library to provide sufficient CD, DVD, VHS, photos & other digital resources	82	20.6	81	20.4	138	34.8	86	21.6	9	2.3	397	100
I find e-resources portals are easy to access, informative & easy to navigate in this library	94	23	120	30.3	120	30.3	63	16	3	0.6	397	100

Table 10 presents respondents' perceptions of the library's physical environment and facilities.

Table 10

Library as a Place and Services as Perceived by Library Users

Statement	SA		A		N		D		SD		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Library as a place provides sufficient secretarial services	102	25.5	70	17.6	30	7.5	83	20.8	6	1.2	397	100
lighting of the Library Building is conducive	149	37.4	84	21	129	32.4	33	8.3	3	0.6	397	100
Cleanliness of the Library and its conducive environment enhance learning	155	38.9	140	35.2	31	7.7	2	0.4	11	2.7	397	100
Library as a place provides sufficient computer workstation for users	117	29.4	86	21.7	159	40.0	33	8.3	2	0.4	397	100
Library as a place provides reliable wireless connections to the internet	121	30.5	90	22.5	155	38.9	26	6.6	4	1.1	397	100
Library has sufficient seating, carrels, discussion rooms & study areas	126	31.8	71	17.8	149	37.4	44	11	7	1.7	397	100
Library place provides sufficient book borrowing and returning kiosks	114	29	76	19	157	39	47	11.8	4	1.1	397	100
Library as a place provides sufficient cloakrooms/lockers	157	33.8	85	18.3	171	36.8	40	10.3	4	1.1	397	100
Library is comfortable, clean & well lighted with clean air	145	36.6	73	18.4	141	35	37	9.2	1	0.2	397	100
Library provides timely and clear information about equipment which is not working	114	28.8	95	23.8	154	38.7	30	7.5	4	1.1	397	100
Directional and warning sign, emergence doors/windows in case of fire alarm	120	30.3	81	20.4	159	40	32	7.9	5	1.2	397	100
Library Reference Services (Current awareness Services and Selective Dissemination of information etc. CAS, SDI	130	28.0	89	19.1	194	41.7	50	10.8	2	0.4	397	100
The seating arrangement of the library is attractive	190	47.9	75	19.1	16	4	55	13.9	1	0.2	397	100

4.7 Discussion

University libraries in Tanzania provides services mainly to students and academic staff. Since the libraries are the heart of any university in enhancing its activities to realize its missions/vision through quality library service provision (QLSP) then they should be observing global /Tanzanians standards. The findings revealed that 61.2% are

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using library adequately as it opens on time and time provided for using it is adequate. This implies that university libraries are striving to provide information resources and services as per local and international standard. Therefore, the library management should ensure that library is opened on time and skilled staff are available to give services to users. This is similar to the study done by Nzewi (2023) who found out that library staff through their professional skills are able to guide and support users to get the needed information resource to achieve their educational goal. Therefor libraries should ensure the library facilities have the required trained staff which enhance the utilization of the resource and facility on given time.

Again, to ascertain the factors that influenced the level of satisfaction of library services, a binary logistic regression model was used and the results indicate that several factors had a statistically significance influence on the user satisfaction with library services. Among them with their corresponding probabilities are noise ($p = 0.043$), bad photocopy ($p= 0.025$), lack of air conditioners ($p=0.018$), lack weekend services ($p=0.044$), early closing time ($p=0.025$). This implies that, users across all universities have been affected by noise, poor photocopy services, lack of cool environment given the hot climate condition in East Africa, lack of week end services and early closing of the library. This leads to dissatisfaction with library services

The study found that noise levels, poor photocopying services, lack of air conditioning, lack of weekend services, and early closing times are significant factors affecting user satisfaction in libraries. Reducing noise levels and providing quieter areas and improving photocopying facilities could improve satisfaction. Expanding hours to include weekends and extending operating hours could also improve satisfaction. Addressing these issues could lead to better library experiences for users. This results are similar and a bit contrary on sounds to the study by Peng *et al*. (2022) on university library space renovation based on user learning experience in two Wuhan universities and found out that library design should abide with some elements that affects learning experience of university library users, the results of binary logistic regression shows that elements such as indoor physical space comfort and in door sounds environment comfort have a positive effects on the frequency and length visits to the library.

On the perception of level of satisfaction on the quality of library services among library users is influenced by five aspects of library updated library collection, conducive library place, reliable library services, well trained and skilful staff as well as functioning library facilities. The majority of respondents 75% perceive library staff as approachable, polite, friendly and empathetic, and are available to respond timely and in humble manner. These results are almost similar to study done by Ojei and Popoola (2023) who indicated that the library staff provides the library services with positive attitudes, prompt and are always ready to respond to users' query, responsiveness, assurance, access, good communications skills and empathy, library staff positively influences the users access to effective library services. However, most of the library staff perform their duties properly but the complaint that they have so many users to serve at one therefore they found they are exhausted with duties, with this observation library management should balance staff and user's ratio in service-oriented category.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study therefore concluded that library staff, services, collection and place are the major essentials features that affect the perception of the library users in utilization of library facilities in general. Also, the study found out library users indicated that library staff are approachable, polite, friendly and empathetic. Moreover, the study found out that library books collection in various programs was sufficient in the library, the seating arrangement was attractive and library collection such as books in a given program are sufficient. Therefore, the study concluded that library users were satisfied by the services in terms of library collection, library environment, staff, facilities and services provided.

5.2 Recommendations

Based on the study's findings, several suggestions are made to increase satisfaction levels and improve Tanzanian university libraries' satisfactory perceptions. These include; a number of actions are suggested to improve library services in order to boost users' satisfaction and encourage academic performance. First, in order to foster an environment that is conducive to teaching, learning, and research, the university library should guarantee the ongoing provision of current educational learning resources. In addition to increasing academic productivity, having access to up to date and relevant information resources will solidify the library's position as a key part of the university's knowledge base and good quality service provider.

Second, the administration of the library should create a welcoming and encouraging atmosphere that invites library users to freely engage with its resources and its librarians. A friendly environment increases user involvement and makes an important contribution to favorable opinions about the quality of the services. In addition, the library should hire and maintain competent librarians who have the professional skills necessary to provide users with knowledgeable advice and support on how to use its resources and technology available in their libraries. Lastly, focus should be directed on enhancing the physical infrastructure of the library. To guarantee comfort, accessibility, and

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functionality in the library space, sufficient and practical fittings such as computer workstations, study carrels, discussion tables, and lounge chairs should be provided. All of these enhancements are necessary to increase patron users' satisfaction and strengthen the library's support of the university's main academic purpose.

REFERENCES

Akande, S. O. (2023). Postgraduate law students' attitude towards the use of electronic information resources in two universities in Nigeria. *NAU Journal of Library and Information Science, 8*, 54–70.

Alam, M. J., & Mezbah-ul-Islam, M. (2021). User satisfaction with library services in university libraries of Bangladesh. *International Journal of Library and Information Science, 13*(2), 12–25.

Albrecht, S. (2023). *The safe library: Keeping users, staff, and collections secure*. Rowman & Littlefield.

Aminu, M., & Trivedi, M. (2022). Evaluating users' satisfaction of information resources and services in university library: A case study of Shrimati Hansa Mehta Library, the Maharaja Sayajirao University of Baroda, Gujarat, India. *Library Philosophy and Practice, 11*(8), 1–12.

Antonia, B. D., Amy, P. A. A., & Williams, E. N. (2024). Torn between two worlds: Perceptions of the role, status, and career progression of librarians working in university libraries. *The Journal of Academic Librarianship, 50*(2), 102861. https://doi.org/10.1016/j.acalib.2023.102861

Ashilungu, M., & Onyancha, O. B. (2024). Faculty–librarian cooperation in collection development at the University of Namibia library, with special reference to electronic resources. *Collection and Curation, 43*(1), 1–15. https://doi.org/10.1108/CC-11-2022-0041

Bachynska, N., Horban, Y., Novalska, T., Kasian, V., & Gaisynuik, N. (2024). University library information resources as a basis for enhancing educational and professional programmes in information, library and archival studies. *Acta Informatica Pragensia, 13*(1), 1–14. https://doi.org/10.18267/j.aip.123

Bamkin, M. (2020). The moral obligation for interlibrary lending. *Journal of Librarianship and Information Science, 52*(4), 1–9. https://doi.org/10.1177/0961000619880956

Chandrakar, K. (2024). *Introductory Library Science and Technology*. Academic Guru Publishing House.

Cox, A. (2023). Factors shaping future use and design of academic library space. *New Review of Academic Librarianship, 29*(1), 1–17.

Dameria, C., Akbar, R., Indradjati, P. N., & Tjokropandojo, D. S. (2020). A conceptual framework for understanding sense of place dimensions in the heritage context. *Journal of Regional and City Planning, 31*(2), 139–163. https://doi.org/10.5614/jpwk.2020.31.2.2

Devi, G. R., & Bhatt, D. (2024). A comprehensive study on library service quality: Bridging user perception gaps and implementing effective improvement strategies. *Library of Progress-Library Science, Information Technology & Computer, 44*(3), 304.

Donkor, A. B., Asimah, A. P. A., & Nwagwu, W. E. (2024). Torn between two worlds: Perceptions of the role, status, and career progression of librarians working in university libraries. *The Journal of Academic Librarianship, 50*(2), 102861. https://doi.org/10.1016/j.acalib.2023.102861

Elias, J. D., & Lubua, E. W. (2024). The impact of usability, functionality and reliability on users' satisfaction during library system adoption. *The Journal of Informatics, 1*(1), 13–21.

Golder, P. N., Dekimpe, M. G., An, J. T., Van Heerde, H. J., Kim, D. S., & Alba, J. W. (2023). Learning from data: An empirics-first approach to relevant knowledge generation. *Journal of Marketing, 87*(3), 319–336.

Hamilton-Nixon, R. (2019). Academic libraries as third place: Spatial transformation of the library learning environments at the University of Johannesburg (Master's thesis, University of Johannesburg, South Africa).

Idowu, A. O., & Oso, O. O. (2022). Influence of library service quality on perceived librarians' image in selected private universities in South-West Nigeria. *International Journal on Integrated Education, 5*(4), 1–15. https://doi.org/10.31149/ijie.v5i4.2579

Ilako, C., Bukirwa, J. M., & Maceviciute, E. (2025). The library is my everything: Mapping the meaning of university library spaces in Uganda. *The Journal of Academic Librarianship, 51*(6), 103–145.

Israel, G. D. (1992, November). Determining sample size: Program evaluation and organizational development, IFAS, University of Florida (PEOD-6). Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida.

Kaishe-Mulungu, D. D., Lwehabura, M. J. F., & Angello, C. (2024). Library service provision for improved satisfaction among library users in selected university libraries in Tanzania. *Regional of Information and Knowledge Management, 9*(1), 11–28.

Kaishe-Mulungu, D., & Lwehabura, M. J. F. (2025). Evaluation of ICT resources and barriers to adoption in improving library service delivery for higher user satisfaction in Tanzania. *African Quarterly Social Science Review, 2*(4), 169–179. https://doi.org/10.51867/AQSSR.2.4.16

Kaushik, D. K. (2022). *Management of libraries in the new millennium*. KK Publications.

Licensed Under Creative Commons Attribution (CC BY-NC)

Kekana, M. D., & Kheswa, S. E. (2020). The gap between user perceptions and expectations of students at the main library of the University of KwaZulu-Natal: Pietermaritzburg Campus. *South African Journal of Information Management*, *22*(1), 1–9.

Khan, D. K. M., Ali, M. K., & Sunil Kumar, R. (2019). Users' satisfaction on library and information resources, facilities and services: A case study in Vidyavardhaka First Grade College, Mysore. *ResearchGate*, 1–21.

Khan, S. A., & Bhatti, R. (2020). Factors affecting digital skills of university librarians for developing & managing digital libraries: An assessment in Pakistan. *Library Philosophy and Practice*, Paper 4230. https://digitalcommons.unl.edu/libphilprac/4230

Khan, S. A., & Shahzad, K. (2024). Key features of digital library management systems (DLMS) for developing digital libraries: An investigation from LIS practitioners in Pakistan. *Journal of Librarianship and Information Science*, *56*(1), 29–42.

Kim, J. A. (2018). Dimensions of user perception of academic library as place. *The Journal of Academic Librarianship*, *42*(5), 450–460.

Kim, Y., & Yang, E. (2022). Academic library spaces and student activities during the COVID-19 pandemic. *The Journal of Academic Librarianship*, *48*(4), 102529. https://doi.org/10.1016/j.acalib.2022.102529

Kiriri, P. N. (2018). Service delivery: The perceptions of users of library services in a private university in Africa. *European Journal of Multidisciplinary Studies*, *3*(4), 221–231.

Kothari, C. R. (2014). *Research methodology: Methods and techniques* (3rd ed.). New Age International.

Mahmood, K., Ahmad, S., Rehman, U. S., & Ashiq, M. (2021). Evaluating library service quality of college libraries: The perspective of a developing country. *Sustainability*, *13*(5), 1–15. https://doi.org/10.3390/su13052968

Malik, S. A., Fatima, T., Jia, Y., & Pannu, H. (2024). The influence of library service quality, library image, place, personal control and trust on loyalty: The mediating role of perceived service value and satisfaction. *International Journal of Quality & Reliability Management*, *41*(4), 1111–1129.

Mbua, G. (2025). Assessment of user satisfaction with library services in selected university libraries in Tanzania. *Journal of Information and Knowledge Management*, *15*(1), 44–59.

Mbughuni, A. S., Mtega, W. P., & Malekani, A. W. (2022). Exploring academic staff engagement in depositing locally produced research content in open access institutional repositories in Tanzania. *IFLA Journal*, *48*(4), 523–537.

Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.

Miao, Y., Chen, Z., Chen, Y., & Tao, Y. (2024). Sustainable architecture for future climates: Optimizing a library building through multi-objective design. *Buildings*, *14*(6), 1877. https://doi.org/10.3390/buildings14061877

Molson, A. R. (2022). Perception of postgraduate students towards the quality of library services provided at Mzuzu University (Doctoral dissertation, Mzuzu University).

Mubofu, C. (2023). Experiences, purposes, satisfaction and missing library services as predictors of library information services provision: A case study. *Alexandria*, *33*(1-3), 64–79.

Mubofu, C., Mambo, H., & Samzugi, A. (2020). Academic libraries and information resources preservation strategies: Past, present and the way forward. *Covenant Journal of Library & Information Science (CJLIS)*, *3*(1), 1–14. https://doi.org/10.47231/YMKG7952

Mulalike, W. (2015). A comparative study on customer satisfaction among public and academic libraries: The case of the national central library and Dr. Wilbert Chagula library, University of Dar es Salaam (Doctoral dissertation, University of Dar es Salaam).

Mushi, C., Mwantimwa, K., & Wema, E. (2020). Perceptions of librarians towards the adoption of embedded librarianship in Tanzania. *University of Dar es Salaam Library Journal*, *15*(2), 21–38.

Mushi, C., Mwantimwa, K., & Wema, E. (2023). Librarians' competencies for implementing embedded librarianship in university libraries. *Journal of Librarianship and Information Science*, *55*(3), 798–812.

Mwilongo, K. J., Luambano, I., & Lwehabura, M. J. (2020). Collection development practices in academic libraries in Tanzania. *Journal of Librarianship and Information Science*, *52*(4), 1152–1168.

Nzewi, A. N. (2023). Use of library and information resources among fresh students in university libraries in College of Health. *Asian Journal of Education and Social Studies*, *48*(2), 123–130. https://doi.org/10.9734/ajess/2023/v48i21059

Ofori, W. O., Markwei, E., & Quagraine, N. T. (2020). Marketing intangibles: The case of library services in higher education institutions. *Library Hi Tech News*, *37*(3), 15–20. https://doi.org/10.1108/LHTN-11-2019-0085

Oguntuase, M. O., Okhakhu, D. O., & Fasae, J. K. (2024). Leadership styles and collection development practices of librarians in academic libraries: A case of Ekiti State, Nigeria. *Collection and Curation*, *43*(2), 1–15.

Ojei, L. N., & Popoola, S. O. (2023). Users' perception of staff attitude as a determinant of effective library service delivery in federal universities in South-West Nigeria. *Library Philosophy and Practice*, 1–12. https://digitalcommons.unl.edu/libphilprac/7681/

Licensed Under Creative Commons Attribution (CC BY-NC)

Okello-Obura, C., & Ikoja-Odongo, R. (2019). User satisfaction with library services in East African university libraries. *Library Philosophy & Practice*. https://digitalcommons.unl.edu/libphilprac

Omar, A. M. (2023). Contribution of libraries in attaining sustainable development goal four in Zanzibar: 2018–2022 (Doctoral dissertation, The Open University of Tanzania).

Owusu-Ansah, S. (2024). Repurposing university library spaces for improved learning satisfaction: The moderating role of organizational size. *Journal of Access Services, 21*(2), 71–104.

Pandey, G. P. (2024). Doing a literature review in English language teaching research: Practical suggestions. *Access: An International Journal of Nepal Library Association, 3*, 133–148.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multi-item scale for measuring customer perceptions of service quality. *Journal of Retailing, 64*(1), 12–40.

Peng, L., Wei, W., Gong, Y., & Jia, R. (2022). University library space renovation based on the user learning experience in two Wuhan universities. *International Journal of Environmental Research and Public Health, 19*(16), 10395. https://doi.org/10.3390/ijerph191610395

Riratanaphong, C. (2024). Assessing users' demand for library space: Insights from an architecture school. *Journal of Architectural/Planning Research and Studies, 21*(2), 361–386.

Robinson, H. (2022). Advancing information literacy: Examining the impact of library programs in central academic libraries. *International Journal of Research in Management Fields, 2*(01), 1–5.

Saragih, B. A. P., Jamaluddin, & Mahyuni. (2021). Analysis of the influence of the quality of library services on library satisfaction. *Scholars International Journal of Law, Crime and Justice, 4*(2), 89–96.

Shahzad, A., Hassan, R., Aremu, A. Y., Hussain, A., & Lodh, R. N. (2021). Effects of COVID-19 in e-learning on higher education institution students: A group comparison between male and female. *Quality & Quantity, 55*(1), 123–140. https://doi.org/10.1007/s11135-020-01028-z

Simba, C. (2021). User perceptions of library service quality in private universities in Tanzania: A case of University of Iringa. *Journal of Issues and Practice in Education, 12*(1), 1–18. https://doi.org/10.61538/jipe.v12i1.911

Tashakkori, A., & Teddlie, C. (2008). *Mixed methodology: Combining qualitative and quantitative approaches*. Sage.

Tribelhorn, S. K., & Young, C. (2022). Key performance indicators for assessing sustainability in academic libraries. *Journal of Library Administration, 62*(7), 1–15. https://doi.org/10.1080/01930826.2022.2056789

United Nations. (2022). *The sustainable development goals report 2022*. United Nations Publications.

United Republic of Tanzania. (2022). *Higher education report*. Tanzania Commission for Universities. https://www.tcu.go.tz/publications/higher-education-statistics

Vijayalatha, C. (2023). Enhanced and changing role of library and information professionals in the digital era. In *Proceedings of National Conference on Exploring the Past, Present, and Future of Library and Information Science* (p. 130).

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Determinants of self-driven referral among clients seeking outpatient services at Bungoma County Referral Hospital, Kenya

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ABSTRACT

Self-referred cases, where patients do not visit primary healthcare (PHC) facilities and instead consider visiting higher-level hospitals, create a negative burden on the healthcare system and jeopardise the attainment of the universal health coverage (UHC) requirements of the Sustainable Development Goal (SDG) 3.8. The prevalence of self-referral has been estimated at 84.3% in Kenya, and Bungoma County Referral Hospital (BCRH) has overutilisation, which is explained by systemic PHC gaps; however, there is a paucity of empirical studies that explain the determinants of overutilisation. This research evaluated the factors that have an impact on self-referrals in outpatient clientele visiting BCRH. Using the Health Belief Model (HBM), the research operationalised the concept of self-referral by the severity of perceived illness and mistrust in PHC and perceived benefits of care at a higher-level facility. An analytical cross-sectional design was used. The study population was 1,880, with a prevalence of 84.3%, which has a sample size of 201 patients in the Outpatient Department, Antenatal Care, Mother and Child Health, and Family Planning clinics. Purposive sampling identified key informants and systematic random sampling patients. Information was obtained through a pre-test validity structured questionnaire and key informant interview (KII) guide; quantitative data were analysed with chi-square tests and odds ratios ($p < 0.05$) using Statistical Package for Social Sciences version 27, and qualitative data were done through thematic analyses. Findings showed that self-driven referral rate in BCRH was 51.7%. Out of the 201 respondents, 71.6% were female, 73.2% were below 32 years of age and 60.2% were secondary education holders. Propensity toward self-referral was stronger among male clients (Odds Ratio [OR] = 4.418, $p = 0.040$) as well as those having tertiary education (OR = 0.094, $p = 0.006$). This study concludes that the factor of self-motivated referral in Bungoma County can be highly influenced by the systemic inadequacy of PHC, especially the insufficiency of diagnostics and the availability of medication and is also exacerbated by gender and educational gaps. This study recommends strengthening of PHC infrastructure, the guaranteeing of continuous medication availability, the coordination of insurance requirements with referral policies and the building of trust in communities asthe necessary steps in reducing unnecessary self-referrals and promoting UHC.

Keywords: Bungoma County Referral, Primary Health Care, Self-Referral, Outpatient Services

I. INTRODUCTION

The client-made referral, where patients bypass the lower-level health institutions and go to the higher-level facilities, is majorly a challenge to the rationality of healthcare systems all around the world as well as its fairness. This practise is also in opposition to the principles of primary health care (PHC) as stipulated by the Alma-Ata Declaration issue of 1978 and once again by the Abuja Declaration issue of 2006, neither of whom failed to highlight the universal access to affordable and effective healthcare in their majority get-list (World Health Organisation [WHO], 2020). The self-referral practises reveal the systemic discrepancies between patient efficiencies and the service provisions, thus creating the inefficiencies, inequities, and increase in workloads to the higher-level facilities (Escamilla *et al*., 2018; Yao, 2018). The phenomenon has great impact on achieving Sustainable Development Goal (SDG) 3.8 that seeks to achieve universal health coverage (UHC) by ensuring everyone has equitable access to quality healthcare services without fear of not affording them (WHO, 2020). Empirical data collected in different geographical settings show a significant difference in self-referral rates as it reflects the differences in healthcare organisation, its accessibility, and the patient trust towards the lower-level services (Abere *et al*., 2021; Bell *et al*., 2020).

Health declarations in Sub-Saharan Africa have been uneven, and several countries have been unable to operationalize PHC because of a lack of infrastructures, financial inaccessibility, and sociocultural fences (WHO, 2020). Even though the Abuja Declaration proposed a need to allocate more resources in the health sector, the distribution of

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resources remains unequal between the various parts of the region so that there would be an uneven access to healthcare services of high quality (Larson *et al*., 2019). Self-referral has become specifically widespread in African locations, as patients tend to lack confidence in primary-level establishments because of perceived shortcomings in diagnostic abilities, availability of medication, and staffing (Mubiri *et al*., 2020). The self-referral rate is reported to be 29% in Uganda and more than 60 per cent in Nigeria and Ethiopia, which represents weakness in the system in terms of PHC delivery (Abere *et al*., 2021; Okoli *et al*., 2017). Such patterns vary health inequities, put the pressure on referral hospitals, and make the quality of care, creating the necessity to adopt region-specific strategies to empower PHC infrastructure and the fact that more people believe in the frontline services.

The policy frameworks and the provisions of the Kenyan constitution are directing its health system with consideration of the fact that health is a fundamental human right. The right of the highest attainable standard of health is guaranteed in article 43(1) of the Constitution of Kenya (2010) and the Kenya Health Policy (2014-2030) and the Vision 2030 provide the focus on universal coverage to quality healthcare on all levels of service delivery (Ministry of Health, 2014). Nevertheless, Kenya still reports one of the highest self-referral rates in Sub-Saharan Africa and research shows that a as high as 84.3% of patients engage in bypass lower-level facilities as their initial choice to acquiring care in higher-level hospitals (Escamilla *et al*., 2018). Distance, waiting time, access to diagnostic services, and patient opinion about the quality are among the factors that influence this trend (Bell *et al*., 2020). The consequence ant excessive use of referral hospitals negatively affects the functionality of healthcare system and defies national and worldwide aims to fulfil SDG 3.8 by the UHC.

The issue of the client-driven referral is most severe in Bungoma County where patients arc at the Bungoma County Referral Hospital (BCRH), more so in other secondary healthcare facilities in Kanduyi and Webuye West sub-counties (Ministry of Health [MOH], 2022). This focus of healthcare usage is an indication of systemic imbalances in the distribution and perceived quality of primary-level services, which then result in bypassing of local facilities. Furthermore, the overuse of BCRH according to the study not only spreads the resources but also affects the referral system's intention at the national level to enhance patient flow and maximise service delivery to all levels of treatment (MOH, 2022). Despite the high-wide spread of self-referral in the county, there has been little empirical research to identify the underlying socio-demographic and system factors that create or drive this behaviour. These dynamics are important for informing interventions aimed towards strengthening PHC delivery to reduce inequities in service-seeking behaviour and bring Bungoma County health systems more broadly aligned with Kenya's UHC agenda.

1.1 Statement of the Problem

The principles of self-driven referral, when patients do not use primary health facilities to address the issue and refer directly to hospitals of a higher level, negate the effectiveness of referencing in Kenya and offers an added load on already limited resources (World Health Organisation, 2020). In the Sub-Saharan Africa, self-referral rates are high because of inadequate infrastructure, undermined trust in the services of lower level and perceptions to gaps in objectivity (Mubiri *et al*., 2020; Bell *et al*., 2020). One of the highest is 84.3% in Kenya ranking among the world (Abere *et al*., 2021). System-wide weaknesses are highlighted by the over-use of the Bungoma County Referral Hospital (Ministry of Health, 2022) at county level, and very few empirical studies have been conducted in the subject to date, thus indicating a promising approach for this study. This study endeavoured to evaluate the determinants of self-driven referral among clients seeking outpatients' services such as outpatient department (OPD) antenatal care (ANC), child welfare clinics (CWC), mother and child health (MCH), and family planning (FP), at Bungoma County Referral Hospital.

1.2 Research Objective

To evaluate the determinants of self-driven referral among clients seeking outpatient services at Bungoma County Referral Hospital, Kenya

II LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Health belief Model

In the early 1950s the social psychologists Irwin M. Rosenstock, Godfrey Hochbaum, S. Stephen Kegeles, and Howard Leventhal (at that time serving the U.S. Public Health Service) tested the characteristics of this Health Belief Model [HBM] (Rosenstock, 1974). The model was first meant to make sense of the failure of people to engage in preventive health services like tuberculosis screening. It assumes health-related behaviours to be affected by perceptions of the people regarding susceptibility, severity, benefits and barriers and cues to action and self-effects. The HBM has over the years been utilised worldwide to examine the human behaviours like vaccination, testing, life service use (mothers), and treatment adherence (Champion & Skinner, 2008).

Self-referral behaviours have been explained through the HBM in the research of healthcare utilisation. As an illustration, studies in Ethiopia and Ghana utilised the model to demonstrate that the perception of disease severity and the distrust of the patients in the facilities of lower tiers was the strongest predictor of going around primary care (Mubiri *et al*., 2020; Bell *et al*., 2020). When applied to the situation at the Bungoma County, the HBM is used to investigate how

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customers' perceptions of the seriousness of illnesses, perceived insufficiency of primary facilities, and perceived benefits of visiting BCRH can affect their self-referral intentions. All determinants in this study (including socio-demographic factors, and perceived quality of care) would be assigned to the categories of the HBM constructs, thus determining individual and structural power of self-driven referral and deciding how to interfere in the primary healthcare system and decrease the unwarranted crowding at the referral hospital.

2.2 Empirical Review

Self-driven referral, in which patients circumvent the primary care and go directly to higher level hospitals is a recurrent challenge in the world. A cross-sectional study conducted on 822 patients in Bangladesh revealed that 59% of them preferred to bypass primary facilities due to inadequate care (28%), or inadequate facilities (23%) (Hasan *et al*., 2024). Such studies indicate that even customers are dissatisfied with their diagnostic ability, shortage of medicine, and wait times cause patients to go to third tier hospitals (WHO, 2020). Such actions are counterproductive to the ethics of primary health care (PHC) as envisaged in the Alma-Ata Declaration and are counterproductive to advancing universal health coverage (UHC) in SDG 3.8 (WHO, 2020). The outcome is that there will be congestion in the referral hospitals, an increase in costs and uneven access to services.

The cross-sectional hospital-based design is available in most studies in the world since 2018 that utilises structured questionnaires in the procedure of capturing patient experiences and determinants (Hasan *et al*., 2024). Although such approaches offer prevalence estimates and related factors, they are prone to self-report bias, and their use focuses on causal inference. Results are regularly consistent with the conclusion that perceived severity of the illness, closeness to the tertiary hospitals as well as distrust in the field of primary care is the predominant reason behind bypassing (Escamilla *et al*., 2018). Nevertheless, little interventional/longitudinal studies are while investing measures to diminish bypass, and there is a deficiency in proof of effective system-level adjustment. This disjunction is especially applicable in the areas of outpatient services, where the role of determinants other than maternal health is not much explored.

The prevalence of self-referral in Sub-Saharan Africa has a wide range of 35 percent in Uganda to more than 80 percent in Ethiopia and Kenya (Mubiri *et al*., 2020; Abere *et al*., 2021). In a multi-centre study developing in Ethiopia (n=446), 70.4% were self-referred, and both higher education (Adjusted Odds Ratio [AOR] = 0.35, 95% Confidence Interval [CI] 0.101 – 0.950), and knowledge of referral systems (AOR=0.31, 95% CI 0.16 – 0.68) decreased the likelihood, whereas perceived illness severity increased the likelihood (Alemu *et al*., 2025). Those results state the fact that individual and systemic factors do interfere with the decisions surrounding referrals. However, despite the proposal by the Abuja Declaration to invest in PHC, there are still way too many countries in Africa with insufficient infrastructure, lack of medicine supply, and insufficient diagnostic services, and they continue to support bypassing behaviours (WHO, 2020).

There is debate between scholars that make self-referral irrational and a rational outcome to poor PHC systems. The lack of trust in the lower-levels facilities, inefficient staffing, and low quality of service is provided as the reasons why patients avoid going through (Bell *et al*., 2020). Some believe that this behaviour indicates a misperception of the patients, others believe it is a reasonable response to the shortcomings the patient sees in the entire system (Mubiri *et al*., 2020). Nevertheless, limited literature evaluates the PHC capacity rigorously in conjunction with patient decision-making and attributing this versus that makes attribution disputable. Besides, other types of interventions like the implementation of referral guidelines or community education are not evaluated sufficiently. This creates a gap on research on scalable strategies supporting PHC and lessening disparities in healthcare access in the region.

This is because Kenya is one of the few countries with the highest self-referral rates in Sub-Saharan Africa with estimates indicating 86% percent (Adoyo *et al*., 2021). A hospital-based cross-sectional study of 161 women seeking skilled birth attendance in Marsabit County involved 47.2 percent not using the facilities at a lower level (Adoyo *et al*., 2021). Some of the predictors were age (2539 years, AOR=5.17, p=0.048), previous delivery at the hospital where participants enrolled in the scheme (AOR=5.40, p=0.014) and willingness to receive more ANC services (AOR=4.06, p=0.010). Perceived privacy and confidentiality on the other hand decreased self-referral (AOR=0.37, p=0.048). This was a narrow study as it was limited to maternal health and cannot be generalised to outpatient.

As an example, policy-oriented studies in the Kenyatta National Hospital (KNH) demonstrate how enforced referral guidelines can affect the hospital. An intervention study revealed that orthopaedic walk-in admissions reduced to 45.1% down to 54.9% (p=0.013) whereas facility referrals went up to 53.4% up to 46.6% (Omondi *et al*., 2024). A different analysis found that there were significant decreases in level 23-facility referrals (p=0.002), including more so in those in the private facilities (Omondi *et al*., 2024). After all, there were still openings, including the fact that formal referral letters continued to be under-utilised. These results could outline the prospects and weaknesses of enforcing policies. However, there is no previous peer-reviewed article after 2018 investigating outpatient self-referral determinants in county referral hospitals beyond Nairobi, and the gap in evidence is thus critical that the research covers.

The population of the Bungoma County (located in Kenya) served 1.7 million people with 143 public health facilities, but the population presents an unequal distribution of patients to the Bungoma County Referral Hospital (BCRH) (County Government of Bungoma, 2024). Recording of self-care pilot programmes have shown problems in things such as uncertainty of policy frameworks, challenges in reporting, and shortages of commodities that can make the patients go

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to the higher-level hospitals to secure services. Such results indicate a weakness of PHC, although, they are only qualitative, which do not provide the prevalence or determinants of outpatient self-referral.

There is little quantitative evidence of Bungoma. In a descriptive analysis of 137 diabetic outpatients at BCRH, 60% of the customers were content with service quality, and 88.3% said they received glycemic control services whereas 80.8% reported receiving complication management services (Amoro *et al*., 2021). Despite being useful, this research was not an original peer-reviewed study but specific to its condition, so the results could not be generalised. Since 2018 no research has been published comprehensive to investigate the determinants of outpatient self-referral in Bungoma County. The given gap implies the significance of the current research that aims at assessing socio-demographic and systemic factors affecting self-driven referral at BCRH, thus affecting the county and national strategies of the UHC.

III. METHODOLOGY

In this study, a cross-sectional analytical design was used to explore the factors of the self-driven referrals among the outpatient client at the Bungoma County Referral Hospital (BCRH). Quantitative method was used while the qualitative was used to give insights to the quantitative data. Self-driven referral was the dependent variable, socio-demographic issues (age, sex, marital status, education, income) were the independent independently published factors, and perceived severity of illness was a mediating factor.

BCRH was considered based on criteria of low facility density, (1.4 per 10,000) compared to the national level (2.4 per 10,000), and the high use of outpatient (220% in 2021/2022). A total of 1,880 outpatient clients visited BCRH per week, which made the target population, which was also considered based on the utilisation of outpatient services at the clinics [antenatal care (ANC), mother and child health (MCH) and family planning (FP)] clients. Clients whose age was lower than 18 years and too weak to cooperate or those with psychotic illnesses were not included.

The sample size adopted was 201 respondents was calculated using Cochran formulae, with self-referral prevalence of 84.3%. The purposive sampling was used to select the facilities in-charge to conduct the key informant interviews (KIIs), whereas systematic random sampling identified the clients across the clinics (OPD: 147, ANC: 16, CWC: 30, FP: 8). Data collection was done employing structured questionnaire and KII guide. Webuye County Hospital was selected for pre-testing of questionnaire from 21 clients to improve on the validity and reliability. Data collection was achieved using trained four research assistants. Data analysis was done by the aid of Statistical Package for Social Sciences version 27. This generate both descriptive and inferential (Odds Ratio). Data was presented in frequency tables. The thematic analysis of qualitative data was done to complement quantitative results and was reported in narration and verbatim. Ethical approval was obtained from Kenyatta University and research permit obtained from National Commission for Science, Technology and Innovation (NACOSTI) and the county government of Bungoma, Department of Health Bungoma County. This ensured that this study upheld ethical conduct during data collection

IV. RESULTS & DISCUSSION

4.1 Results

4.1.1 Socio Demographic Characteristics of the Study Population

The study sought to establish the sociodemographic characteristics of the respondents in terms of age, gender, education, marital status, occupation and average household income.

Most of young adults (43.3%) participants were aged 25-31 years and 29.9% were aged 18-24 year. This means that almost three-quarters (73.2%) of participants were under 32 years. The proportion of over 39 years of age was at only 11.4%, which indicates that younger individual has the most frequent cases to Bungoma County Referral Hospital. Gender wise, most of the respondents were females (71.6%) as compared to the male population (28.4%), which was perhaps a resultant indication of health seeking behaviour among women or the character of services received (ANC, MCH, FP clinics). In terms of education, most of the respondents were well-educated as 60.2% had secondary level education, 25.9% had college level education, and 6.5% university education. The proportion of individuals possessing the first or non-basic education was very low, only 7.5%.

Concerning marital status, most of them were married (59.7%), and 37.8% were single, widows or divorced were 2.5%. This distribution denotes that family responsibilities could impact on the family health-seeking patterns. Occupation wise, self-employment (34.8%) and formal employment (25.4%) were the predominant. Farming constated 19.9% and the unemployed individuals were 12.9%. Others 7% were students. Household incomes had a diversity where the highest in earnings ranged between KES 5,000 -9,999 according to 26.9% of the respondents. Approximately 36.3% were earning under KES 5,000 per month, and 36.7% were earning over KES 10,000. This indicates a mixed-income population with many people found in low and middle-income incomes. Table 1 presents the findings.

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Table 1

Social Demographic Characteristics of the Respondents

Variable	Categories	Frequency	Proportion	Variable	Categories	Frequency	Proportion
Age (Years)	18-24	60	29.9%	Occupation	Employed	51	25.4%
	25- 31	87	43.3%		Self-employed	70	34.8%
	32-38	31	15.4%		Farmers	40	19.9%
	<39	23	11.4%		Unemployed	26	12.9%
Gender	Male	57	28.4%		Students	14	7.0%
	Female	144	71.6%	Average monthly income (Kes)	≤ 1000	35	17.4%
Education level	No formal education	4	2.0%		≥1000- ≤ 4999	38	18.9%
	Primary	11	5.5%		≥5000 ≤ 9999	54	26.9%
	Secondary	121	60.2%		≥10000 ≤ 14999	26	12.9%
	College	52	25.9%		≥15000 ≤ 19999	23	11.4%
	University	13	6.5%		≥ 20,000	25	12.4%
Marital status	Married	120	59.7%				
	Single	76	37.8%				
	Widowed/Divorced	5	2.5%				

Source: Researcher (2024)

4.1.2 Proportion of self-driven clients at the Bungoma County Referral Hospital

In this study, the dependent variable was those who self-referred. According to this study, 51.7% (n=104) sort medical services at the BCRH before seeking services in their nearest health facility. Figure 4-1 summarizes the proportion of self-referred and referred clients visiting BCRH at the time the study was conducted.

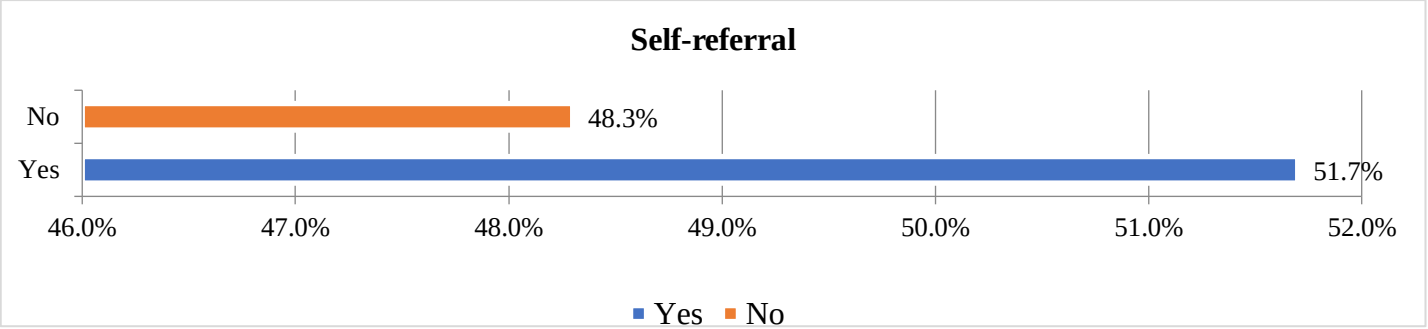

Figure 1

Proportion of self-driven clients at BCRH

4.1.3 Association between Self-Driven Referral and Socio - Demographic Factors

Table 2 presents socio-demographic factors associated with self-driven referral, showing odds ratios, confidence intervals, and significance levels.

Table 2

Socio-Demographic Factors Influencing Self-Driven Referral

Variable	Categories	Self-referral		OR	95% CI		P-value
		Yes	No		Lower	Upper	
Age (Years)	≤ 35	42	3	3.387	.923	12.428	0.054
	> 35	62	15				
Gender	Male	37	2	4.418	.963	20.277	0.040
	Female	67	16				
Education level	Primary-secondary	64	17	0.094	.012	.735	0.006
	Post-secondary	40	1				
Marital status	Married	69	14	0.563	.173	1.839	0.337
	Not Married	35	4				
Occupation	Formal employment	37	4	1.933	.593	6.300	0.268
	Informal employment	67	14				
Average Income (Kshs)	≤ Kes 23,670	90	17	0.378	.047	3.069	0.346
	> Kes 23,670	14	1				

Source: Researcher (2024)

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In this study, bivariate analysis showed that gender and educational level were significantly associated with self-driven referral (p value = 0.040; OR 4.418) and (p value = 0.006; OR 0.094), respectively. Therefore, this study notes that according to gender, male clients are four times more likely to self-refer to BCRH for health care services as compared to female clients. Additionally, this study notes that clients with primary and secondary education are 90.6% less likely to self-refer to BCRH for health care services as compared to clients with tertiary education.

4.1.4 Health System Factors Influencing Self-Driven Referral

When clients were asked to rate the significant cause that made them to visit BCRH other than their nearest primary health care facility, the finding of this study showed that participants agreed that; availability of laboratory services, availability of medicine, and hospital reputation significantly contributed to their self- referral at 89.5% (n=91), 83.6% (n=87) and 74.1 % (n=87) respectively.

Table 3

Health System Factors Influencing Self-Driven Referral

Costs of Services	**5**	**4**	**3**	**2**	**1**
Affordability of services	2 (1.9%)	1 (1.0%)	1 (1.0%)	2 (1.9%)	98 (94.3%)
Insurance cover	63 (60.6%)	26 (25.0%)	6 (5.8%)	4 (3.9%)	5 (4.8%)
Deposit requirement	10 (9.6%)	5 (4.8%)	2 (1.9%)	25 (24.0%	62 (59.6%)
Quality of Care	**5**	**4**	**3**	**2**	**1**
HCW competency	21 (20.2%)	4 (3.9%)	5 (4.8%)	33 (31.7%)	41 (39.4%)
HCW attitude	15 (14.4%)	5(4.8%)	3(2.9%)	30 (28.9%)	51 (49.0%)
Time spent on queues	12 (11.5%)	6 (5.8%)	3 (2.9%)	16 (15.4%)	67 (64.4%)
Opening hours	8 (7.7%)	3(2.9%)	3(2.9%)	22 (21.2%)	68 (65.4%)
Availability of lab services	62 (59.6%)	29 (29.9%)	5 (4.8%)	1 (1.0%)	7 (6.7%)
Availability of medicine	68 (65.4%)	9 (8.7%)	1 (1.0%)	6 (5.8%)	20 (19.2%)
Hospital reputation	67 (64.4%)	20 (19.2%)	5 (4.8%)	5 (4.8%)	(6.7%)

Source: Researcher (2024)

The results indicate that affordability of services was rated as least contributory by most respondents (94.3%), while insurance cover was identified as greatly contributory by 60.6% of participants. Deposit requirements were considered least contributory by 59.6% of respondents. With respect to quality of care, health care worker (HCW) competency was rated least contributory by 39.4%, and HCW attitude by 49.0%. Time spent on queues and opening hours were also largely considered least contributory, at 64.4% and 65.4% respectively. In contrast, availability of laboratory services (59.6%), availability of medicines (65.4%), and hospital reputation (64.4%) were rated as greatly contributory by most respondents.

4.1.5 Association between Health Systems Factors Interaction with Household Average Income Impacting Self-Referral to Bungoma County Referral Hospital

Table 4 also shows the association between household average income and the chosen health system variables, and how they have co-experience to affect self-referral behaviour to Bungoma County Referral Hospital using odds ratios, confidence and significant levels in relation to respondent data.

Concerning an Odds Ratio between health system factors and household income, less possibility of self-referral and nonsignificant association was observed to be associated with affordability of service (OR=0.860, p=0.486), insurance policy ownership (OR=0.545, p=0.475) and affordability of deposits (OR=0.962, p=0.962). Lower-income individuals were more likely to be influenced by perceptions of provider competency (OR= 1.571, p=0.492), attitude (OR= 3.042, p=0.071) and waiting time (OR= 2.086, p=0.257), though it was not statistically significant. Equally, lower-income individuals were more likely to be influenced by the supply of medicine (OR=1.278, p= 0.724), lab services (OR=1.182, p=0.231), cleanliness (OR= 1.543, p=0.545), and privacy (OR=3.625, p=0.278), but this had significance in their influence.

Table 4

Health Systems Factors and Household Average Income Impacting Self-Referral to Bungoma County Referral Hospital

Health system factors		**Household average income**		**OR**	**95 CI**		**P value**
		<= Kes 23,670	> Kes 23,670		**Lower**	**Upper**	
Affordability of service	Disagree	86	14	0.860	0.795	.931	0.486
	Agree	3	0				
Insurance policy	Disagree	7	2	0.545	0.101	2.942	0.475
	Agree	77	12				
Affordability of the deposit requirement for clients	Disagree	75	12	0.962	0.192	4.804	0.962
	Agree	13	2				

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Competency of the healthcare providers	Disagree	66	8	1.571	0.430	5.748	0.492
	Agree	21	4				
Attitude of the healthcare providers	Disagree	73	8	3.042	0.873	10.594	0.071
	Agree	15	5				
Time spent in queues	Disagree	73	10	2.086	0.572	7.599	0.257
	Agree	14	4				
Time of operation	Disagree	79	11	2.693	0.620	11.704	0.173
	Agree	8	3				
Cleanliness of the hospital	Disagree	72	10	1.543	0.376	6.329	0.545
	Agree	14	3				
Availability of lab services	Disagree	8	0	1.182	1.083	1.290	0.231
	Agree	77	14				
Availability of medicine	Disagree	23	3	1.278	0.327	4.988	0.724
	Agree	66	11				
Privacy during examination.	Disagree	87	12	3.625	0.305	43.078	0.278
	Agree	2	1				
Reputation of the hospital	Disagree	11	1	1.932	0.230	16.266	0.538
	Agree	74	13				

Source: Researcher (2024)

4.2 Discussion

The study found a 51.7% self-referral rate (n=104), which is a significant number of patients who skipped the primary healthcare centres. This observation points to a structural issue in the Kenyan healthcare referral system where primary health centres (PHCs) are supposed to be used as the first point of contact point. The rate observed is also consistent with the data provided by Oladimeji *et al*. (2021) who noted a rate of 55.3% in a similar setting, which leads to believing that self-referral is not an isolated event and is instead a regular occurrence in the region of Sub-Saharan Africa. On the other hand, the present study gives a lower percentage compared to those of Escamilla et. al. (2018) in Kakamega which was a high as 84.3%. this might be attributed to variable study design and sampling frames, especially the addition of urban populations with more facilities choice. The current findings are also higher than the ones reported by Mubiri *et al*. (2018) in Uganda (29%), during which their population sample was limited to acute and maternal care cases, which hinders the generalisability of bypass behaviour. Key informant observed that:

> *"The majority of referral cases that we have received in the facility was because there were no supportive health systems to address health complications like maternity related care, blood transfusion and complex complication like meningitis, albeit infrequently."*

This finding shows how the existence of infrastructural gaps in lower-level facilities is a direct contributor to a bypass behaviour and therefore quantitative data that self-referral is motivated by a lack of perceived sufficiency with PHC services is echoed.

The sense of technical superiority in BCRH was found to be an influential factor of self-referral. Customers consider BCRH as a healthcare centre, which provides specific services, which PHCs do not. This view is aligned with the results of Yao (2018) in Ghana, when the extent and quality of services in tertiary plants influenced the choice of clients. The reasons given to avoid PHCs include preventive care, pain management, and gynaecological services, which is indicative of the tendency of patients to find all round solutions to their routine and complex needs.

> *"... BCRH is known for upscale services that are not accessible to other health facilities in Bungoma County. Even health promoters are known to help guide clients to BCRH."*

This observation serves to strengthen bypass behaviour by community actors, but also it is concerning that a lack of trust in PHC diagnosing capacity, reported by Debsarma and Choudhary (2025). The inability to provide X-ray and laboratory services is further supported by Bell *et al*. (2020) and serves as one more indication of the gaps in the chain of infrastructures that transfers clients to facilities of a higher tier.

Insurance cover was found as an enabler of bypass behaviour, which allowed clients to focus on quality and privacy (private wards) rather than proximity. This observation is not foreign to Roh and Moon (2005) in Korea where insurance-access led to more people going to hospitals in cities. Key informant said this concerning self-referral and insurance cover.

> *"Clients who have National Health Insurance cover would not simply skip PHCs to save money but rather enjoy the perks like having their own wards in BCRH."*

This demonstrates that even without making direct use of monetary expenses, insurance plays a role in raising standards of care quality. Kenyan context is opposed to Putri *et al*. (2021) in Indonesia, where insurance did not have a visible effect, which indicates that the correlation between insurance and self- referral is very situational and relies on the infrastructure of the local healthcare. The low risk that deposit is insured, which additionally implies that financial impediments at PHCs are not as related to initial payments but rather to the perceived quality of the service, which demonstrates more resource inequalities in the devolved healthcare environment in Kenya.

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As indicated by quantitative analysis, male clients tended to self-refer, which confirms the results by Rajman and Mahomed (2019) in South Africa who stated that men tended to bypass PHCs. This trend is supported by patriarchal traditions in the Bungoma County, and the increased financial mobility and control of men.

> *"Men struggle with accessing conventional primary care services because when compared to the number of services, one can find, rather, rather targeted services that specifically cater to men."*

This observation brings about the gendered aspects of accessing healthcare in that, a man considers referral hospitals to be better placed in terms of treating complex conditions. But this is contrary to Okoli *et al*. (2017) in Nigeria, who presented statistics of greater self-referral in female clients highlighting the significance of local socio-cultural attributes in determining referral behaviour.

Education was also a predictor of self-referral, which can be attributed to the findings of Abere *et al*. (2021), who concluded that informed clients do not use PHCs, as reflected by a higher understanding of the services offered. Tertiary educated clients had high expectations of PHC gap and chose specialised care at BCRH, especially when dealing with complex cases.

> *"The customers who have tertiary education would most likely be culturally critical of PHC constraints and would want the specialised treatment of BCRH."*

This is contrary to Yao (2018) who stated that there is no significant connection between education and self-referral and this effect is mediated by local PHC quality. Clients having primary or secondary education, unable to get PHC because of the lack of awareness or financial capacity, often had to accept the PHC despite the perceived inadequacy, as it happened in Abere *et al*. (2021). Earnings of households were not significant, even though richer households were slightly more inclined to self-refer, which was also the case in Abere *et al*. (2021), where the purchasing power determined care preferences.

Financial access is often mentioned as a motivator of self-referral, but this researcher was not in agreement with it since income and deposit requirements were not a major predictor (Roh and Moon, 2005). This supports Putri *et al*. (2021) in Indonesia, who propose that in the Kenyan devolved healthcare system, the perceived quality of the services is more important than direct financial expenditures.

> *"Within the health system, we have got drugs that we can store as health centre; but then there are some drugs that we cannot be in a position to order them at KEMSA."*

These include the observation of inequalities in systemic resources between PHC and tertiary facilities that underpin the quantitative observation that, it is the structural inequalities that drive bypass behaviour, and not affordability. The implication here is that healthcare reforms that will enhance PHC infrastructure can be more successful in decreasing self-referral compared to financial interventions that work on their own.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that at least 51.7% of outpatients at Bungoma County Referral Hospital are self-referred. These referrals were occasioned by the scarcity of specialised equipment and the availability of insurance cover at their primary facilities. Moreover, male was more likely to self-refer as compared to women. Lastly, those with lower education, i.e., primary and secondary school were skewed towards using primary care services as compared to those with tertiary. This leans towards financial capacity which leads to choice of the facility with most opting for self-referral. Both financial aspects and attitudes towards quality-of-service influence self-referral patterns. Strategic interventions need to be initiated to address the insurance policy guidelines, while consolidating strengths in diagnostic facilities and drug availability.

5.2 Recommendation

The study recommends decentralisation of specialised care and in order to lower increasing cases of referrals to BCRH. This could be achieved through initiatives aimed at sensitizing the community members in Bungoma County on service available at their primary care facilities.

REFERENCES

Abere, T. M., Atnafu, D. D., & Mulu, Y. (2021). Self-referral and associated factors among patients attending adult outpatient departments in Debre Tabor General Hospital, Northwest Ethiopia. *BMC Health Services Research, 21*(1), 642. https://doi.org/10.1186/s12913-021-06642-7

Adoyo, J. O., Makunyi, E. G., Otieno, G. O., & Yoos, A. (2021). Magnitude and determinants of self-referrals among women seeking skilled birth attendance services: A cross-sectional hospital-based study in Marsabit County, Kenya. *International Journal of Community Medicine and Public Health, 8*(6), 2813–2821.

Alemu, T., Yigzaw, Z. A., Alemu, M. E., & Asmare, L. (2025). Self-referral practice among patients attending outpatient department of Northwest Comprehensive Specialized Hospital, Ethiopia: A multi-center cross-sectional study. *Frontiers in Public Health, 13*, 1434669. https://doi.org/10.3389/fpubh.2025.1434669

Licensed Under Creative Commons Attribution (CC BY-NC)

Amoro, V. A., Abiiro, G. A., & Alatinga, K. A. (2021). Bypassing primary healthcare facilities for maternal healthcare in North West Ghana: Socio-economic correlates and financial implications. *BMC Health Services Research, 21*(1), 545. https://doi.org/10.1186/s12913-021-06573-3

Bell, G., Macarayan, E. K., Ratcliffe, H., Kim, J. H., Otupiri, E., Lipsitz, S., Hirschhorn, L., Awoonor-Williams, J. K., Nimako, B. A., Ofosu, A., Leslie, H., Bitton, A., & Schwarz, D. (2020). Assessment of bypass of the nearest primary health care facility among women in Ghana. *JAMA Network Open, 3*(8), e2012552.

Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (4th ed., pp. 45–65). Jossey-Bass.

County Government of Bungoma. (2024). *Health and sanitation.* https://www.bungoma.go.ke/ova_dep/health-and-sanitation/

Debsarma, D., & Choudhary, B. K. (2025). Exploring the Socio-Ecological factors of healthcare-seeking behaviour among patients/people from Rural Unqualified Health Providers in the rural settings in West Bengal, India. *SSM-Health Systems, 4*, 100046.

Escamilla, V., Alker, A., Barker, P., & Mokdad, A. H. (2018). Access to primary health care: Bypassing health facilities in rural Ghana. *BMC Health Services Research, 18*(1), 445. https://doi.org/10.1186/s12913-018-3249-8

Hasan, M. J., Rafi, M. A., Nishat, N. H., *et al.* (2024). Patient self-referral patterns in a developing country: Characteristics, prevalence, and predictors. *BMC Health Services Research, 24*, 651. https://doi.org/10.1186/s12913-024-11115-8

Larson, P. S. (2018). Access to health care in Sub-Saharan Africa: Challenges in a changing health landscape in a context of development. In K. Heggenhougen (Ed.), *Health in ecological perspectives in the Anthropocene* (pp. 95–106). Springer. https://doi.org/10.1007/978-981-13-2526-7_8

Ministry of Health [Kenya]. (2014). *Kenya health policy 2014–2030: Towards attaining the highest standards of health*. Government of Kenya. https://kehpca.org/wp-content/uploads/2020/06/kenya_health_policy_2014_to_2030.pdf

Ministry of Health [Kenya]. (2022). *Health sector working group report: Medium term expenditure framework 2023/24–2025/26*. Government of Kenya. https://treasury.go.ke/wp-content/uploads/2022/12/Health-Sector-Report.pdf

Mubiri, P., Kajjo, D., Okuga, M., Marchant, T., Peterson, S., Waiswa, P., & Hanson, C. (2020). Bypassing or successful referral? A population-based study of reasons why women travel far for childbirth in Eastern Uganda. *BMC Pregnancy and Childbirth, 20*(1), 497. https://doi.org/10.1186/s12884-020-03194-2

Mursa, R., Patterson, C., & Halcomb, E. (2022). Men's help-seeking and engagement with general practice: An integrative review. *Journal of Advanced Nursing, 78*(7), 1938-1953.

Okoli, H., Obembe, T., Osungbade, K., Adeniji, F., & Adewole, D. (2017). Self-referral patterns among federal civil servants in Oyo State, South-Western Nigeria. *Pan African Medical Journal, 26*, 105.

Oladimeji, F. A. (2021). New public health approach to oral health care accessibility in a pandemic. *Nigerian Dental Journal, 29*(2), 25-34.

Omondi, M. P., Chege, J. M., Ong'ang'o, H., & Sitati, F. C. (2024). Effect of enforcement of the national referral guidelines on patterns of orthopedic admissions to Kenyatta National Hospital, Kenya: Pre–post intervention study. *PLOS ONE, 19*(8), e0290195.

Putri, F. R. J. (2021). Literature review: Analysis of factors related to user satisfaction on the online reference system for BPJS health participants in Semarang City. *Muhammadiyah International Public Health and Medicine Proceeding, 1*(1), 149-158.

Rajman, A., & Mahomed, O. H. (2019). Prevalence and determinants of self-directed referrals amongst clients at hospitals in eThekwini District, KwaZulu-Natal 2015. *South African Family Practice, 61*(2), 53–59.

Roh, C. Y., & Moon, M. J. (2005). Nearby, but not wanted? The bypassing of rural hospitals and policy implications for rural health care systems. *Policy Studies Journal, 33*(3), 377-394.

Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs, 2*(4), 328–335.

The Constitution of Kenya. (2010). *The Constitution of Kenya, 2010*. National Council for Law Reporting. https://www.parliament.go.ke/sites/default/files/2017-05/The_Constitution_of_Kenya_2010.pdf

World Health Organization (WHO). (2020). *Primary health care on the road to universal health coverage: 2019 monitoring report*. World Health Organization. https://apps.who.int/iris/handle/10665/344057

Yao, J. (2018). Bypassing primary healthcare facilities for childbirth in Ghana: A multilevel analysis of the 2014 Ghana Demographic and Health Survey. *BMC Health Services Research, 18*(1), 464.

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Communication pathways and youth engagement in climate-smart agriculture in Bumula Sub-County, Kenya

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ABSTRACT

Climate-Smart Agriculture (CSA) is essential for developing climate change resilience in susceptible areas such as Kenya's semi-arid regions. The involvement of youths is crucial for the transformation of agriculture, but uptake remains low. While the successful delivery of information is an established driver of CSA, the best communication channels for various CSA practices are unknown. This research, guided by the Diffusion of Innovations, Social Learning, and Channel Complementarity theories, aimed to evaluate the impacts of different information communication channels on young people's involvement in CSA in Bumula Sub-County, Kenya. A correlational research design was employed. A structured questionnaire was administered to a simple random sample of 120 youth farmers (18-35 years), drawn from a target population of 10,888 in the Siboti and Khasoko wards. Data was analysed using descriptive statistics and binary logistic regression in SPSS to estimate the relationship between communication sources (extensions, media, and social networks) and the uptake of different CSA practices. The analysis revealed a strong association between information sources and involvement in CSA (Cramer's V = 1.0). Pathways to involvement were practice-specific: extension agents predominated for knowledge-based practices (agroforestry, 47.7%), social networks for visible practices (intercropping, 43.0%), and mass media for market-related inputs (improved seeds, 41.2%). The findings demonstrate that a one-style-fits-all communication approach is ineffective. A multi-channel, segmented strategy that aligns the communication channel with the distinctive characteristics of each CSA practice is imperative to bridge the information gap efficiently and strengthen youth-led climate adaptation. The results provide an evidence-informed path for policymakers and practitioners to upgrade extension services by integrating digital platforms, strengthening peer networks, and adopting tailored communication strategies to enhance youth engagement in CSA.

Keywords: Climate-Smart Agriculture, Information Communication Pathway, Youths in Agriculture, Youth Unemployment

I. INTRODUCTION

In recent years, there have been studies that analyzed how communication channels affect the uptake of farming innovations among rural farmers in developing countries (Atser et al., 2023; Mahama et al., 2024). For instance, Mulungu et al. (2025) found that text message notifications significantly increased farmers' uptake of new practices, highlighting the transformative potential of information and communication technologies (ICTs). Similarly, studies in Kenya have identified the role of both formal extension and social networks in passing on information (Morrison et al., 2025). But there is one major constraint. Much of the research lumps communication channels together into a single, undifferentiated category and does not often elucidate which specific pathways work best to improve different types of Climate-Smart Agriculture (CSA) practices, especially among the young population. This gap is most urgent in sub-Saharan Africa, where the involvement of youth in agriculture is both a demographic imperative and a development issue.

The urgency of this question is intensified by the expanding climate crisis. In Kenya, and across Eastern Africa, climate change manifests itself as increasingly erratic rainfall, increasing droughts, and rising temperatures, which poses an immediate danger to farm production and food security (Allen et al., 2025). Climate Smart Agriculture has now become an important paradigm in building resilience and increasing productivity in a sustainable manner while also trying to mitigate greenhouse gas emissions (Kabato et al., 2025). However, the adoption of CSA practices is frustratingly low, often below 25% in Bumula Sub-County considered risk-prone (Mwanzia et al., 2025). The challenge of adoption is further compounded by an allied crisis. Youth unemployment and the aging farmer population. Though the youth between 18-35 years represent 38% of Bumula's population (Onyango et al., 2025) and are a strong force for agricultural transformation, their participation is hindered by an array of institutional, economic, and social barriers, including limited access to credit, land, and most importantly, relevant information (Deininger et al., 2022).

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Existing literature indicates that the relationship between communication, youth, and Climate-Smart sAgriculture (CSA) is not well understood. While the worth of information undoubtedly is an international phenomenon, studies have reported mixed findings. For example, some studies, such as that of Morrison et al. (2025) and (Mulungu et al., 2025). Onyango et al. (2025) found a weak association (Cramer's V = 0.3-0.5) between adoption of technology and extension contact, citing logistics and relevance issues. Other studies, by contrast, praise digital platforms as the magic bullet for harnessing technology-savvy youth (Haddock et al., 2022). This raises a vital shortcoming in the lack of a fine-grained, practice-by-practice communication model. The typical "one-size-fits-all" approach to dissemination does not anticipate that the technical level, visibility, and resource requirements of different CSA practices may call for specialized communication channels. Is a WhatsApp group as useful for transferring the subtleties of agroforestry as it is for selling new varieties of seeds? The literature is quiet on this key differentiation, making it so that policymakers and extension officers lack an overt, evidence-based framework by which to segment their communication approaches.

In response to this gap that has been identified, this study formulates the following core research inquiry: How do various information communication channels affect youth engagement in particular Climate-Smart Agriculture practices in Bumula Sub-County, Kenya? This query is expanded to explore: 1) Through which of the above-mentioned channels of communication (extension officers, media, social networks) do different CSA practices find their major sources of information? 2) Is there a statistically significant relationship between these channels of communication and youth adoption of CSA? 3) How do the particular attributes of a CSA practice (technical expertise, observability) influence which mode of communication best advertises it?

1.1 Statement of the Problem and Research Gap

The empirical literature confirms that communication is a critical driver of agricultural innovation adoption. However, a critical limitation persists since much of the existing research treats communication channels as a monolithic category, often reporting on their generalized effectiveness or ineffectiveness without linking specific channels to the distinct attributes of specific agricultural practices (Onyango et al., 2025; Molala & Makhubele, 2021). This has resulted in a body of work with mixed and sometimes contradictory findings, as seen in the stark contrast between studies that report a strong link between extension and adoption and those that find a weak association.

This generalized approach has created a significant gap in both theory and practice. Policymakers and extension officers lack an evidence-based, fine-grained framework to guide their communication strategies. It remains unclear, for instance, whether a WhatsApp group is as effective for transferring the complex knowledge required for agroforestry as it is for promoting the use of improved seeds. Therefore, a practice-by-practice analysis is urgently needed. This study sought to fill this gap by moving beyond a generic assessment of communication channels. It investigated how the effectiveness of extension officers, mass media, and social networks is contingent upon the technical complexity and observability of specific CSA practices among the youth population in Bumula Sub-County, Kenya. By doing so, it provided a segmented communication model that can enhance the efficiency and impact of youth engagement in climate-smart agriculture.

1.2 Research Objectives

The general objective of this study was to evaluate the impact of information communication channels on youth engagement in Climate-Smart Agriculture practices in Bumula Sub-County, Kenya.

The specific objectives were:

i. To identify the primary communication channels (extension officers, mass media, and social networks) through which youth access information for different CSA practices.
ii. To determine the existence and strength of the statistical relationship between these communication channels and the adoption of CSA practices among the youth.
iii. To evaluate how the specific attributes of a CSA practice (such as technical complexity and observability) influence the effectiveness of different communication channels.

II. LITERATURE REVIEW

2.1 Theoretical Review

The study is anchored on three interconnected theoretical frameworks that explain the adoption of innovations and the role of communication.

2.1.1 Diffusion of Innovations (DOI) Theory

The Diffusion of Innovations (DOI) theory by Kapoor et al. (2014) provides a foundational framework for understanding how new ideas and technologies, such as CSA practices, spread through social systems over time. The theory posits that the rate of adoption of an innovation is influenced by its perceived attributes: relative advantage, compatibility, complexity, trialability, and observability. This study directly applies the DOI framework by

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hypothesizing that the complexity (technical knowledge needed for agroforestry) and observability (visible results from intercropping) of different CSA practices determine the most effective communication channel for their dissemination. The theory suggests that complex, less observable practices require interpersonal, credible channels like extension agents, while simple, highly observable practices can diffuse effectively through peer networks, a premise this research tests empirically.

2.1.2 Social Learning Theory (SLT)

Social Learning Theory (Deaton, 2015) emphasizes that individuals learn and adopt new behaviors by observing others within their social environment and the consequences of those behaviors. This theory is crucial for understanding the role of informal communication pathways, such as neighbors and friends, in the adoption of CSA. When youth farmers observe their peers successfully implementing a visible practice like intercropping or rainwater harvesting, they are more likely to adopt it themselves. SLT thus explains the efficacy of social networks for practices where vicarious learning and social validation are powerful motivators, complementing the DOI framework by focusing on the mechanism of peer-to-peer influence.

2.1.3 Channel Complementarity Theory

Channel Complementarity Theory (Rains & Ruppel, 2016) argues that individuals use multiple information channels in a complementary, rather than mutually exclusive, manner to fulfill different information needs. This theory challenges the notion of a single "best" channel and instead supports a segmented, multi-channel strategy. It posits that audiences actively seek out different media for different purposes for instance, using mass media for awareness and extension services for in-depth knowledge. This theory provides the theoretical justification for this study's core argument against a one-size-fits-all communication approach and for a strategy that aligns specific channels with specific CSA practice characteristics.

2.2 Empirical Review

Empirical studies on communication channels and agricultural adoption reveal significant but often contradictory findings, underscoring the need for a more nuanced, practice-specific analysis.

2.2.1 The Role of Extension Services

Several studies highlight the importance of extension services, but their reported effectiveness varies greatly. Morrison et al. (2025) conducted research in the Kenyan dairy sector and reported that farmer-to-farmer extension within social networks was highly effective for sharing knowledge on common practices. In contrast, Gao et al. (2020) in a study in China, found only a weak to moderate association (Cramer's V $\approx$ 0.3-0.5) between extension contact and technology adoption, citing logistical challenges and high farmer-to-agent ratios as major constraints. This contrast suggests that the effectiveness of extension is highly context-dependent, influenced by local infrastructure and the nature of the practice being promoted.

2.2.2 The Efficacy of Social and Digital Networks

The rise of digital platforms has been hailed as a transformative tool for youth engagement. Larochelle et al. (2019) found that text message notifications in Tanzania significantly increased farmers' uptake of new practices, highlighting the potential of low-cost ICTs. Similarly, Singh et al. (2023) in a study in South India, demonstrated that mobile-based agricultural extension services significantly boosted adoption rates. However, other studies offer a more cautious perspective. George (2025), researching agricultural data sharing in Tanzania, concluded that conventional extension and radio were broadly ineffective for youth, citing low digital literacy and the passive nature of such platforms. This creates a clear contrast: while some studies champion digital tools as a "magic bullet," others point to significant barriers to their effectiveness, particularly among certain demographics.

2.2.3 The Function of Mass Media

Mass media has been identified as playing a specific, rather than general, role in information dissemination. Mahama et al. (2024), in a study in the Savannah Region of Ghana, found that mass media was highly effective for disseminating information about commercial inputs like seeds and fertilizers, which are often promoted through advertisements. This aligns with findings from other regions where media serves as a key channel for market-linked information. However, its limitation is also evident. Danso-Abbeam et al. (2018), in Northern Ghana, noted that media was less effective for complex land management practices that require hands-on, experiential learning, a constraint that underscores the channel's inability to deliver rich, interactive communication.

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III. METHODOLOGY

3.1 Study Location and Context

This investigation was conducted in Bumula Sub-County (0°34′N, 34°23′E), a semi-arid locality within Bungoma County, western Kenya (KNBS, 2015). The sub-county was strategically chosen as a research site due to its representative characteristics for studying information dissemination patterns related to Climate-Smart Agriculture among youth populations. Characterized by increasingly unpredictable bimodal rainfall regimes (800-1,200 mm annually) attributed to climate change (Bouteska et al., 2024), the 396 km² territory presents a compelling case for investigating CSA communication dynamics.

Demographic composition reveals a predominantly rural population of 156,000 residents, with youth aged 18-35 years constituting 38% of the inhabitants (Kenya National Bureau of Statistics (KNBS, 2022), creating a substantial cohort for examining agricultural information pathways. The economic foundation rests primarily on smallholder maize-bean production systems, engaging approximately 62% of the youth population (Kirimi et al., 2023). However, agricultural sustainability faces severe challenges from multiple environmental stressors, including prolonged seasonal droughts, erratic precipitation patterns, and documented temperature increases of 1.5°C since the millennium, collectively contributing to 30-40% yield reductions over the past decade (Nying'uro et al., 2023). These climatic stresses are compounded by soil erosion and limited irrigation infrastructure, which covers less than 5% of arable land (Bouteska et al., 2024).

The institutional landscape further compounds these challenges, creating an information-poor environment that necessitates diverse communication strategies. Critical barriers include limited financial inclusion, with only 18% of youth farmers accessing formal credit (Morrison et al., 2025), and constrained extension reach, with merely 32% of farmers receiving formal advisory services (Ministry of Agriculture, Livestock and Fisheries (Kabato et al., 2025). These institutional gaps are exacerbated by significant gender disparities, where 68% of young women report land ownership constraints that potentially limit their access to formal information channels (Federation of Women Lawyers (Atser et al., 2023).

The convergence of climate vulnerability, demographic pressure, institutional limitations, and high dependence on informal networks creates a critical research context where effective information communication becomes paramount for CSA adoption (Morrison et al., 2025). This complex socio-ecological setting provides an ideal natural laboratory for investigating how communication channels mediate youth engagement with climate-resilient agricultural practices, addressing a crucial knowledge gap in agricultural extension literature. See the study map in figure 1.

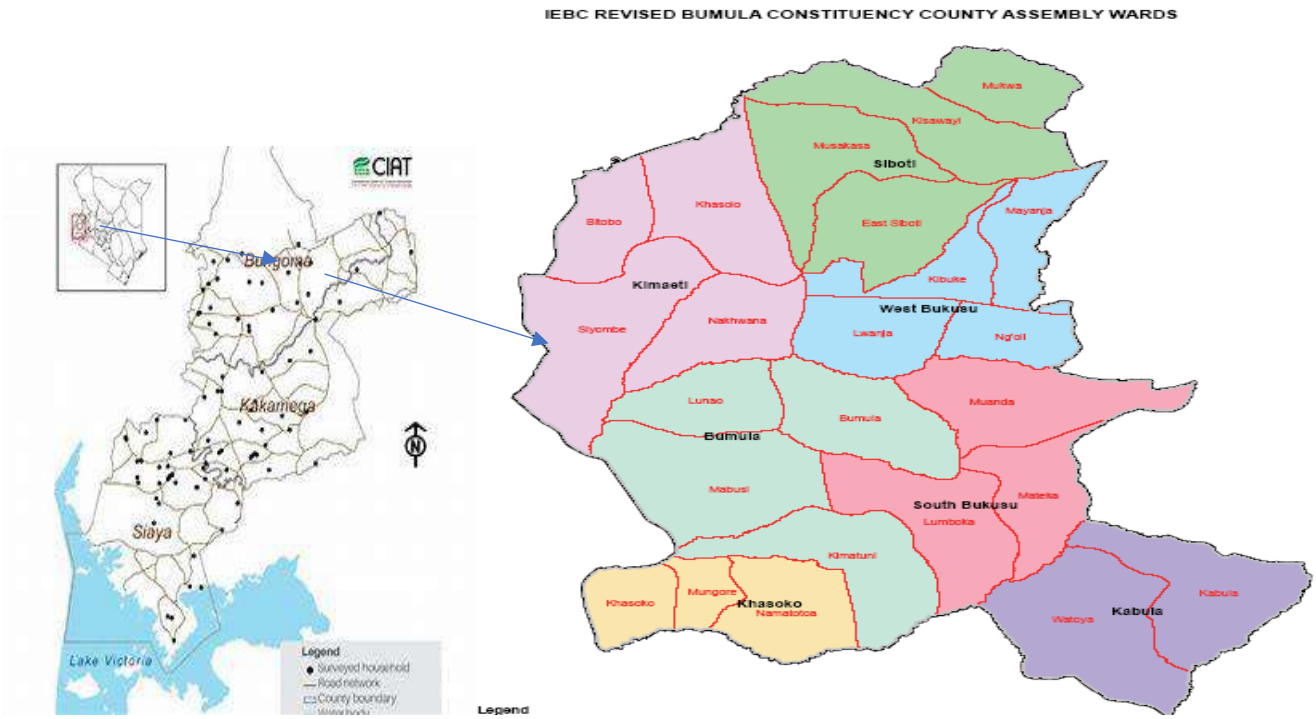

Figure 1
Map of Study Location

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3.2 Research Design

This study adopted an explanatory, correlational research design grounded in the Diffusion of Innovations (DOI) theory (Turner, 2007). This framework was selected to move beyond merely describing relationships and instead to explain how the perceived attributes of different Climate-Smart Agriculture (CSA) practices influence which communication channels become most effective for their adoption among youth. A cross-sectional survey served as the primary data collection method to operationalize this design, providing the quantitative data necessary to test the postulated relationships within the theoretical model at a specific point in time.

The design was particularly appropriate as it enabled the investigation of whether the effectiveness of a communication channel (extension agents, mass media, and social networks) is contingent upon the nature of the CSA practice being promoted. For instance, the DOI theory suggests that practices high in complexity are more effectively disseminated through interactive channels like extension services, while easily observable practices may diffuse more rapidly through social networks. This study specifically tested this nuanced relationship, which is often overlooked in broader communication studies. By applying binary logistic regression, the research was able to model the probability of a youth adopting a specific CSA practice based on their primary information source, thereby providing a predictive and explanatory understanding of communication pathway efficacy (Omeiza Bashiru et al., 2022). This approach provided a more granular and theoretically informed analysis than a standard descriptive survey, directly addressing the research objective of identifying practice-specific communication pathways.

3.3 Target Population

The study focused on 18-35 years youth farmers in Bumula Sub-County, with the youth population being 51,641 (Njenga et al., 2024). The target population at hand was 10,888 youths from Siboti (6,602) and Khasoko (4,286) wards, selected due to their youth farmer concentration, agricultural intensity, and high vulnerability to climate risks, making them an appropriate group for exploring CSA information channels (Debates, 2023).

3.4 Sampling Procedure and Sample Size

A multi-stage cluster sampling design was employed to select a representative cohort of youth farmers. This approach was deemed appropriate for efficiently sampling a population distributed across a wide geographical area while maintaining statistical robustness (Ahmed, 2024).

In the first stage, two administrative wards, Siboti and Khasoko, were purposively selected as primary sampling units. This selection was based on their high agronomic significance, accounting for approximately 83% of the sub-county's agricultural activity, a pronounced climate risk index (7.2/10), and a high density of youth populations (62%), making them critical loci for investigating CSA communication channels (Li et al., 2024). The sample size was calculated using Nassiuma, (2001) coefficient of variation formula, which is designed for finite populations where the variance is not directly known. The formula is expressed as:

$n = \frac{NC^2}{C^2+(N-1)e^2}$, where N is the population size (10,888), C is the coefficient of variation (set at 0.5), and e is the margin of error (set at 0.05). This calculation yielded a base sample of 109 respondents. To account for potential non-response and ensure data robustness, this figure was rounded up to a final sample of 120 youth farmers.

In the final stage, a simple random sampling technique was applied within each selected ward with proportional allocation to ensure representativeness. This resulted in the selection of 73 respondents from Siboti ward and 47 from Khasoko ward, as detailed in Table 1.

Table 1

Proportion of Sample Size per Ward

Ward	Number of youth Farmers	Proportion	Sample size
Siboti	6,602	61	73
Khasoko	4,286	39	47
Total	**10,888**	**100**	**120**

3.5 Instrumentation

Data collection was conducted using a structured survey questionnaire, meticulously designed to capture the study's core variables. To ensure the tool's robustness, a multi-step validation process was employed. Content validity was established through a thorough review by a panel of agricultural extension specialists, who assessed the relevance, clarity, and comprehensiveness of the items. Furthermore, a pilot study was administered to 30 youth in Bumula ward, which served to refine question phrasing, estimate the time required for completion, and identify any potential ambiguities in a field setting. The internal consistency of the scales, particularly for the institutional factors construct, was confirmed via reliability analysis, yielding a Cronbach's alpha coefficient of 0.82, which is considered a good level of reliability (Karimian & Chahartangi, 2024).

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3.6 Data Collection Procedure

The data collection process was executed through a structured, multi-phase procedure designed to ensure the integrity and quality of the field data. Prior to commencing fieldwork, research assistants were recruited and participated in a comprehensive two-day training session. This training covered the study's objectives, the precise meaning of each questionnaire item, ethical protocols for engaging respondents, and techniques for conducting neutral, non-leading interviews.

The primary data were subsequently gathered through face-to-face interviews conducted at the homes or farms of the sampled youth farmers using the structured questionnaire. Each interaction began with the researcher introducing themselves, explaining the study's purpose, and obtaining verbal informed consent before proceeding. To maintain high data quality, a rigorous, multi-layered verification protocol was implemented concurrently with data collection. This involved daily audits of completed questionnaires for consistency and completeness, followed by systematic back-checking where a random selection of 20% of respondents were contacted via phone to verify the consistency of key responses. Furthermore, the GPS coordinates of each interview location were electronically captured to document the spatial distribution of the survey. This meticulous, stepwise approach ensured the collection of robust, verifiable, and high-fidelity data for subsequent analysis.

3.7 Data Analysis

The data analysis was conducted using SPSS version 26, following a two-stage analytical procedure. Initially, descriptive statistics, including frequencies, percentages, and means, were employed to systematically characterize the study sample and summarize the predominant patterns in communication channel usage for different Climate-Smart Agriculture (CSA) practices. Subsequently, inferential analysis was performed using binary logistic regression. This technique was specifically selected to model the probability of CSA practice adoption and to test the statistical influence of the various information communication channels on youth engagement, thereby addressing the core research objective of identifying significant predictive pathways.

IV. FINDINGS & DISCUSSION

4.1 Information Communication Pathways for Climate-Smart Agriculture

The analysis of information sources in Table 2 reveals distinct and purposeful patterns in how youth in Bumula sub-county access knowledge on different Climate-Smart Agriculture (CSA) practices, moving beyond a monolithic view of information dissemination.

Table 2

Frequencies of CSA Use Arising from different Information Communication Pathways

Information of CSA practices	Extension officer		Mass Media		Neighbors and Friends	
	F	%	F	%	F	%
Composting	37	36.3	28	27.5	37	36.3
Rainwater harvesting and storage	30	25.6	42	35.9	45	38.5
Crop rotation	**53**	46.9	27	23.9	33	29.2
Mulching	43	41.3	25	24.0	36	34.6
Drainage	**50**	47.6	22	21.0	33	31.4
Irrigation	30	31.6	26	27.4	39	41.1
Furrow/ ridge planting	41	42.7	29	30.2	26	27.1
Minimum tillage	41	41.4	27	27.3	31	31.3
Improved crop varieties	37	38.1	40	41.2	20	20.6
Agroforestry	**51**	47.7	25	23.4	31	29.0
Terracing	46	43.8	30	28.6	29	27.6
Intercropping	41	36.0	24	21.0	49	43.0
Inorganic fertilizers	**50**	43.9	38	33.3	26	22.8

F – Frequency; % - Percent; N/F – Neighbors and friends; Ext Off – Extension officers

A clear delineation emerges based on the technical complexity and observability of the practices. Extension officers were the dominant information source for knowledge-intensive and permanent land management techniques. Practices such as agroforestry (47.7%), drainage (47.6%), and crop rotation (46.9%) relied most heavily on formal extension. This aligns with the findings of Morrison et al. (2025), who noted that farmers depend on extension agents for technically complex practices that require expert guidance for correct implementation. The high reliance on extension for these practices in Bumula suggests they are perceived as demanding specialized knowledge that is less easily transmitted through informal channels.

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Conversely, informal social networks, including neighbors and friends, were the primary pathway for practices that are highly visible, easily replicable, or managed communally. This was most evident for intercropping (43.0%), irrigation (41.1%), and rainwater harvesting (38.5%). This pattern strongly supports social learning theory (Deaton, 2015), where individuals adopt behaviors observed and validated within their immediate social circles. The prominence of peer-to-peer learning for these practices, also observed in rural Kenya by Haddock et al. (2022), underscores their low perceived risk and the critical role of community-based demonstration in their adoption, particularly for techniques like rainwater harvesting which may involve shared resource management.

Mass media (radio, television) played a significant but specific role, acting as a key conduit for information on market-linked inputs. Media was the leading source of information for improved crop varieties (41.2%) and a major source for inorganic fertilizers (33.3%). This finding corroborates research by Mahama et al. (2024), which found that mass media is highly effective for disseminating information about commercial inputs like seeds and fertilizers, which are often promoted through advertisements and sponsored programs. However, media's lower influence on complex land management practices like terracing (28.6%) and minimum tillage (27.3%) highlights its limitation in delivering the hands-on, experiential learning these methods require, a constraint noted by Danso-Abbeam et al. (2018).

These findings present a nuanced picture that both confirms and challenges broader narratives. The robust role of extension in Bumula contrasts with studies from regions like Northern Ghana, where extension services were found to be ineffective due to logistical constraints and high farmer-to-agent ratios (Apantaku et al., 2016). This discrepancy suggests that Bumula may benefit from a relatively more functional extension infrastructure or targeted youth programs. Furthermore, the practice-specific effectiveness of media underscores the "digital divide" in agricultural extension (Singh et al., 2023). While digital and broadcast media are powerful for simple messages, they cannot replace demonstration for complex techniques. Ultimately, the data argue against a one-size-fits-all communication strategy and instead advocate for a segmented approach that matches the communication channel to the inherent characteristics of the CSA practice being promoted.

4.2 Effect of Information Communication Pathways on Youth's CSA Practice

The quantitative analysis (Table 3) reveals a statistically profound relationship between information communication channels and the adoption of CSA practices among youth in Bumula Sub-County. A chi-square test of independence confirmed a significant association, χ^2 (2, N = 120) = 100.12, $p < .001$. The strength of this association was found to be perfect, as measured by Cramer's V (V = 1.0). This indicates that the specific source of information is a primary determinant of youth participation in CSA, moving beyond a mere correlation to suggest a near-categorical relationship within this sample.

Table 3

Effect of Information Communication Pathways on Youth's CSA Practice

Statistical Measure	Value	Interpretation
Chi-square (χ^2)	100.12139	A significant association between variables.
Degrees of freedom (df)	2	Number of categories minus one for the chi-square test.
p-value	< 0.05	Statistically significant at the 5% level (rejects the null hypothesis).
Cramer's V	1.0	Very strong association between information sources and CSA participation.
Conclusion		Information communication channels significantly influence youths' CSA adoption.

The strength of this relationship offers a powerful confirmation of the enabling potential of information and communication technologies (ICTs) documented in emerging agricultural literature. For instance, Cerjak et al. (2025) demonstrated that mobile phone-based advisories in India significantly increased farmers' adoption of new methods, underscoring the power of accessible, real-time information. Similarly, Ntsoane et al. (2025) found that SMS notifications led to a marked uptick in the uptake of agricultural innovations among Tanzanian smallholders. Our findings from Bumula corroborate this paradigm, suggesting that for a digitally engaged youth population, the very accessibility of information through modern channels is a potent catalyst for change.

However, the perfect association (Cramer's V = 1.0) found in this study stands in stark contrast to several other empirical studies, raising critical questions about contextual factors. For example, research by Wang et al. (2020) in China found only a weak to moderate association (Cramer's V ≈ 0.3-0.5) between extension contact and technology adoption, attributing this to logistical challenges, high farmer-to-agent ratios, and the limited relevance of information provided. This stark discrepancy suggests that the quality, local applicability, and delivery mechanism of information in Bumula's dominant channels may be uniquely effective. The divergence could be attributed to Bumula's relatively higher mobile phone penetration or the targeted use of interactive, youth-specific digital platforms (e.g., dedicated WhatsApp groups, YouTube tutorials) which create a more engaging information ecosystem than the passive, one-way communication noted in less effective studies(Gazi et al., 2024).

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Furthermore, our results, which champion a practice-specific efficacy of channels, directly challenge the findings of studies that have dismissed certain dissemination methods in a generalized manner. For example, Mwinami et al. (2023) concluded that conventional extension and radio were broadly ineffective for youth, citing low digital literacy and the passive nature of such platforms. Our study, conversely, found that mass media was the leading source for market-linked inputs like improved seeds (41.2%), while extension agents were crucial for complex practices like agroforestry (47.7%). This divergence underscores a critical insight: a channel deemed "ineffective" in a generalized sense may be highly effective for a specific type of practice. The failure in some contexts may not be inherent to the channel itself, but in its misapplication. This aligns with the contingency theory of communication, which posits that communication effectiveness is dependent on matching the medium's richness to the complexity of the message (Singh et al., 2023). Complex practices like agroforestry require the rich, interactive communication of extension agents, while simple messages about seed availability are effectively broadcast via media.

The strong link between information channels and adoption in Bumula strengthens the imperative for policymakers to prioritize ICT-integrated, multi-channel extension systems. ICT-based platforms, particularly those already popular with youth like social media and SMS advisories, are essential for scaling information dissemination (Morrison et al., 2025). However, this technological push must be tempered with the caution offered by Molala and Makhubele (2021), who warns that technology-centric policies can exacerbate exclusion in marginalized communities with limited connectivity or digital skills. Therefore, a hybrid or blended approach is paramount. The proven efficacy of social networks for visible practices like intercropping (43.0%) suggests that the most resilient strategy combines the reach of digital tools with the trust and demonstrability of community-level peer learning, creating an information safety net that is both broad and deep.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

It is evident that information communication channels are a key determining factor of youths' engagement with Climate-Smart Agriculture in Bumula Sub-County. Although formal extension services were a prominent source of knowledge, and a strong statistical relationship (Cramer's V = 1.0) was established between communication channels and CSA uptake, efforts have not yet translated into high adoption as evidenced by the small percentage (14.3%) of high adopters. This underlying disconnect underscores the fact that effective information dissemination, critical as it is, is insufficient on its own. The evidence compellingly argues that achievable youth involvement in CSA at scale requires not only segmented communication strategies but also a parallel addressing of the underlying institutional and socio-economic limitations such as poor access to credit, land, and inputs limiting the knowledge-to-sustained-practice transition.

5.2 Recommendations

To effectively bridge the gap from awareness to the widespread adoption of Climate-Smart Agriculture (CSA) among youth, a multi-pronged strategy is essential. First, it is imperative for the Ministry of Agriculture and relevant stakeholders to modernize public extension services. This should be achieved by strategically integrating conventional methods with digital platforms such as targeted SMS alerts and dedicated mobile applications, thereby effectively reaching and engaging technology-literate youth. Second, institutional support should be directed towards reinforcing peer-to-peer knowledge sharing. Scaling up initiatives like youth champion farmer programs can formally leverage the proven power of social learning for practices that are easily observable within communities. Finally, and most critically, a segmented communication strategy must be adopted. This approach entails deliberately matching the promotion channel to the specific characteristics of each CSA practice: utilizing extension agents for knowledge-intensive techniques, mass media for disseminating information on market-linked inputs, and social networks for promoting highly visible practices. Such a diversified and targeted strategy, when implemented in tandem with efforts to address foundational constraints like credit and land access, is paramount for converting youth awareness into sustained, high-level CSA adoption.

REFERENCES

Ahmed, S. K. (2024). How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. *Oral Oncology Reports, 12*, 100662. https://doi.org/10.1016/j.oor.2024.100662

Allen, E. M., Munala, L., Frederick, A. J., Quito, C., Enayat, A., & Ngunjiri, A. S. W. (2025). Climate change and health: Impacts across social determinants in Kenyan agrarian communities. *Climate, 13*(8), 169–180. https://doi.org/10.3390/cli13080169

Licensed Under Creative Commons Attribution (CC BY-NC)

Apantaku, S. O., Aromolaran, A. K., Shobowale, A. A., & Sijuwola, K. O. (2016). Farmers and extension personnel view of constraints to effective agricultural extension services delivery in Oyo State, Nigeria. *Journal of Agricultural Extension, 20*(2), 202–214. https://doi.org/10.4314/jae.v20i2.15

Atser, G. L., Dixon, A., Ekeleme, F., Hauser, S., Fadairo, O., Adekoya, A., Ayanwale, A. B., Agada, M., Oladokun, I., Akpu, P., Sanni, L., Pypers, P., Ampadu-Boakye, T., & Vanlauwe, B. (2023). The effect of communication media on the uptake of agricultural innovations in selected states of Nigeria. *The Journal of Agricultural Education and Extension, 29*(5), 583–604. https://doi.org/10.1080/1389224X.2022.2120026

Bouteska, A., Sharif, T., Bhuiyan, F., & Abedin, M. Z. (2024). Impacts of the changing climate on agricultural productivity and food security: Evidence from Ethiopia. *Journal of Cleaner Production, 449*, 141793. https://doi.org/10.1016/j.jclepro.2024.141793

Cerjak, M., Medici, M., Faletar, I., Sundeep, J. V., & Canavari, M. (2025). Adoption of mobile-based agricultural extension services: Evidence from South India. *Journal of Rural Studies, 120*, 103851. https://doi.org/10.1016/j.jrurstud.2025.103851

Danso-Abbeam, G., Ehiakpor, D. S., & Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: Insights from Northern Ghana. *Agriculture & Food Security, 7*(1), 74–89. https://doi.org/10.1186/s40066-018-0225-x

Deaton, S. (2015). Social learning theory in the age of social media: Implications for educational practitioners. *I-Manager's Journal of Educational Technology, 12*(1), 1–6. https://doi.org/10.26634/jet.12.1.3430

Debates, C. A. (2023). County government of Bungoma County assembly debates the daily Hansard. *183*(204), 1–32.

Deininger, K., Jin, S., & Ma, M. (2022). Structural transformation of the agricultural sector in low- and middle-income economies. *Annual Review of Resource Economics, 14*(1), 221–241. https://doi.org/10.1146/annurev-resource-111820-033252

Gao, Y., Zhao, D., Yu, L., & Yang, H. (2020). Influence of a new agricultural technology extension mode on farmers' technology adoption behavior in China. *Journal of Rural Studies, 76*, 159–173.

Gazi, M. A. I., Rahaman, M. A., Rabbi, M. F., Masum, M., Nabi, M. N., & Senathirajah, M. R. B. S. (2024). The role of social media in enhancing communication among individuals: Prospects and problems. *Environment and Social Psychology, 9*(11), 74–90. https://doi.org/10.59429/esp.v9i11.2979

George, V. (2025). Social sciences & humanities open: Harnessing digital dividends: A systematic review of ICT initiatives for transformation in Tanzanian agriculture. *Social Sciences & Humanities Open, 12*, 101716. https://doi.org/10.1016/j.ssaho.2025.101716

Haddock, A., Ward, N., Yu, R., & O'Dea, N. (2022). Positive effects of digital technology use by adolescents: A scoping review of the literature. *International Journal of Environmental Research and Public Health, 19*(21), 14009. https://doi.org/10.3390/ijerph192114009

Kabato, W., Getnet, G. T., Sinore, T., Nemeth, A., & Molnár, Z. (2025). Towards climate-smart agriculture: Strategies for sustainable agricultural production, food security, and greenhouse gas reduction. *Agronomy, 15*(3), 565–678. https://doi.org/10.3390/agronomy15030565

Kapoor, K. K., Dwivedi, Y. K., & Williams, M. D. (2014). Rogers' innovation adoption attributes: A systematic review and synthesis of existing research. *Information Systems Management, 31*(1), 74–91. https://doi.org/10.1080/10580530.2014.854103

Karimian, Z., & Chahartangi, F. (2024). Development and validation of a questionnaire to measure educational agility: A psychometric assessment using exploratory factor analysis. *BMC Medical Education, 24*(1), 1284. https://doi.org/10.1186/s12909-024-06307-z

Kenya National Bureau of Statistics. (2015). Bungoma County. *World Bank Microdata Library*. https://doi.org/10.2499/p15738coll2.134464

Kenya National Bureau of Statistics. (2022). *Economic survey 2022*. https://www.knbs.or.ke/wp-content/uploads/2023/09/2022-Economic-Survey.pdf

Kirimi, L., Olwande, J., Langat, J., Njagi, T., Kamau, M., & Obare, G. (2023). Agricultural inputs in Kenya: Demand, supply, and the policy environment (pp. 201–230). *International Food Policy Research Institute*. https://doi.org/10.2499/9780896294561_08

Larochelle, C., Alwang, J., Travis, E., Barrera, V. H., Manuel, J., & Andrade, D. (2019). Did you really get the message? Using text reminders to stimulate adoption of agricultural technologies. *The Journal of Development Studies, 55*(4), 548–564. https://doi.org/10.1080/00220388.2017.1393522

Li, Q., Shan, H., Tang, Y., & Yao, V. (2024). Corporate climate risk: Measurements and responses. *The Review of Financial Studies, 37*(6), 1778–1830. https://doi.org/10.1093/rfs/hhad094

Mahama, S. W., Abudu, J. I., Damwah, A. K., & Arhin, E. T. (2024). Influence of communication on smallholder farmers' adoption of agricultural innovations in Damongo of the Savannah Region of Ghana. *African Journal of Empirical Research, 5*(4), 1278–1295. https://doi.org/10.51867/ajernet.5.4.105

Licensed Under Creative Commons Attribution (CC BY-NC)

Molala, T. S., & Makhubele, J. C. (2021). The connection between digital divide and social exclusion: Implications for social work. *Humanities & Social Sciences Reviews, 9*(4), 194–201. https://doi.org/10.18510/hssr.2021.9427

Morrison, R., Cassar, X., Duncan, A. J., Rao, E. J. O., & Barnes, A. P. (2025). Information flows within farmer networks and the implications for farmer-to-farmer extension: Evidence from the Kenyan dairy sector. *The Journal of Agricultural Education and Extension, 31*(5), 785–809. https://doi.org/10.1080/1389224X.2025.2461455

Mulungu, K., Kassie, M., & Tschopp, M. (2025). The role of ICT-based extension in agriculture: Application, opportunities, and challenges. *Information Technology for Development, 91*(126), 1–30. https://doi.org/10.1080/02681102.2025.2456232

Mwanzia, D. K., Mbala, S., & Akuja, T. E. (2025). Assessment of the level of awareness of climate-smart agricultural practices among smallholder farmers in Mwingi West Sub-County, Kitui County, Kenya. *African Journal of Climate Change and Resource Sustainability, 4*(2), 107–116. https://doi.org/10.37284/ajccrs.4.2.3537

Mwinami, N., Dulle, F. W., & Mtega, W. P. (2023). Communication channels and their potential applicability in enhancing agricultural research data sharing among agricultural researchers in Tanzania. *LIBER Quarterly: The Journal of the Association of European Research Libraries, 33*(1), 103–121. https://doi.org/10.53377/lq.12931

Nassiuma, D. K. (2000). *Survey sampling: Theory and methods*. Nairobi University Press.

Njenga, N. N., Oywaya-Nkurumwa, A., & Munyua, C. N. (2024). Perceptions on influence of membership in young farmers clubs on career interest and participation in agricultural activities among secondary school students in Nakuru North Sub-County, Nakuru County, Kenya. *Journal of the Kenya National Commission for UNESCO, 4*(2), 1–9. https://www.ajol.info/index.php/jkncu/article/view/281876

Ntsoane, M. M., Ndoro, J. T., & Wayi-Mgwebi, N. (2025). Multivariate probit model analysis of the factors influencing smallholder farmers' choice of ICT tools: A case study of Mpumalanga, South Africa. *Agriculture, 15*(17), 1817. https://doi.org/10.3390/agriculture15171817

Nying'uro, P., Kimutai, J., & Kiptum, C. (2023). State of the climate Kenya. http://196.202.217.199

Omeiza Bashiru, S., Ibrahim, A., Modu Isa, A., & Ismaila Itofa, I. (2022). Binary logistic regression model with application in students' G.P.A performance. *Arid Zone Journal of Basic and Applied Research, 1*(4), 62–69. https://doi.org/10.55639/607mlkji

Onyango, R., Nzengya, D., & Lihasi, L. (2025). Engendering climate-smart agriculture in Mt. Kenya East: How farmer demographics shape smallholder adoption. *11*(2), 115–132.

Rains, S. A., & Ruppel, E. K. (2016). Channel complementarity theory and the health information-seeking process: Further investigating the implications of source characteristic complementarity. *Journal of Communication, 66*(4), 635–656. https://doi.org/10.1177/0093650213510939

Singh, N. K., Sunitha, N. H., Tripathi, G., Saikanth, D. R. K., Sharma, A., Jose, A. E., & Mary, M.. V. K. J. (2023). Impact of digital technologies in agricultural extension. *Asian Journal of Agricultural Extension, Economics & Sociology, 41*(9), 963–970. https://doi.org/10.9734/ajaees/2023/v41i92127

Singh, R., Slotznick, W., & Stein, D. (2023). Digital tools for rural agriculture extension: Impacts of mobile-based advisories on agricultural practices in southern India. *Journal of the Agricultural and Applied Economics Association, 2*(1), 4–19. https://doi.org/10.1002/jaa2.42

Turner, R. J. (2007). Book review. *Journal of Minimally Invasive Gynecology, 14*(6), 776–783. https://doi.org/10.1016/j.jmig.2007.07.001

Wang, G., Lu, Q., & Capareda, S. C. (2020). Social network and extension service in farmers' agricultural technology adoption efficiency. *PLOS ONE, 15*(7), e0235927. https://doi.org/10.1371/journal.pone.0235927

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Typology of sense relations in Olukhayo in the western region of Kenya

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ABSTRACT

This research endeavour sought to establish the typology of sense relations in the Olukhayo language from the dimension of lexical semantics. Typically, the lexical semantics of sense relations in Olukhayo has not been explored in the preceding linguistic studies. This has consequently triggered the need to investigate the phenomenon. In addition, there is scanty documentation of literature on this language; hence, the motivation for a study, specifically, on the semantic relations that define its lexis. The description of sense relations was informed by lexical priming theory. The study adopted the descriptive research design. This approach is critical in dealing with qualitative data. Ideally, it consists in providing systematic, descriptive and explanatory accounts of data, as is the case with categories or classes of lexical items. A representative sample of 384 informants was identified by use of purposive judgement, complemented by the snowball technique. Data extraction was done through the questionnaire instrument. The data for analysis was drawn from the open class category of words. The analysis of data drew on the tenets of lexical priming theory. Lexical items manifest or display certain links or networks that are semantically motivated. The nature of such links illuminates semantic realities of collocations, semantic associations and colligations. A careful scrutiny via thematic analyses of the nature of semantic interrelationships among the lexical items pointed to a number of lexical relations that characterise lexemes in Olukhayo. They were identified, categorised and coded within the matrix of our research objective. These were relations of synonymy, polysemy and antonymy, homonymy, hyponymy and metonymy. Lastly, the analysis of corpus data mirrored semantic features of collocations, colligations and semantic associations. Indeed, lexical items display secondary senses besides their primary ones (sense extrapolation). Lexical items in Olukhayo are hence characterised by a number of sense relations, as already noted. Thus, it is important to recommend that literature materials are availed in Olukhayo and/orother languages by those with a passion for writing and publications. Additionally, it is critical to appreciate the place and role of sense relations in vocabulary acquisition and teaching for effective pedagogical practices.

Keywords: Collocations, Colligations, Lexical Semantics, Lexeme, Lexis, Sense Relations, Semantic Associations

I. INTRODUCTION

There are various branches that deal with the study of linguistic meaning for example: Lexical Semantics, Grammatical Semantics, Formal Semantics and Linguistic Pragmatics (Cruse, 2011). There is a long-standing philosophical tradition of exploring the meanings of lexical items. During the 20th Century, Wittgenstein (1953) and Quine (1953) intensified their research efforts with a view to establishing the nature of meaning and typology of lexical relations among words and their physical references. Besides being a sub-branch of linguistics, Lexical Semantics may be presumed to be an improvement of this philosophical standpoint (Kent, 2008). This research initiative draws informative insights from the branch of Lexical Semantics. The main focus here is the study of meanings of lexical items; the meanings of content (information) words as opposed to meanings of grammatical (function) words (Pustejovsky, 1995). Semantics is regarded as a discipline which seeks to establish the meanings of lexical items within the vocabulary of any given language. Lyons (1968) observes that the sense of a lexical item constitutes its position within a set or network of relations with other lexical items in a language. The kind of meaning that relates words to each other within the language is distinguished by Gottlob (1892) as sense, or cognitive content. He argues that sense is one of the meanings a word has in the absence of the object referred to by such a word.

Olukhayo is a language spoken by the Bakhayo people found in Busia County of the Western region of Kenya (Angogo, 1980). The language has apparently scanty literature published on it. This might have occurred due to the fact that much of the documented literature in use is drawn from languages such as Logooli, Wanga and Samia among others in the same region (Makokha, 2013; Wabwire, 2010; Makeni, 2006). This trend might gradually pose a big challenge to Olukhayo owing to very stiff competition from other languages that are typically accorded more attention both in

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written and spoken media. Consequently, and at any rate this scenario is bound to render Olukhayo vulnerable to effects of linguistic attrition in the course of time. The Bakhayo comprise a population of approximately 254,044 speakers (Kenya National Bureau of Statistics [KNBS], 2019). This community of Bantu proto-type traces its ancestry in Eastern Uganda. The Bakhayo are said to have migrated from Ibanda in Busoga-Uganda to Bukhayo, their present homeland in Busia County of Kenya (Were, 1967; Angogo, 1980). Olukhayo belongs to Masaba-Luhya group (JE 30); class JE 341 (Maho, 2009). Bukhayo is divided into East, West, and Central locations. Geographically, Mungatsi and Mabunge form the Central region, Nambale forms the Eastern region, Matayos and Busibwabo form the Western region. Olukhayo is classified together with Nyala, Marachi and Samia as the sub-groups of the Western region (Williams, 1973).

On the contrary, one school of thought asserts that Luhya as an ethnolinguistic community is a conglomeration of quite unique and remotely related sub-groups that were classified together for political expediency. Historians of this view further maintain that the phrase 'Luhya' was a coinage of the British administration in Kenya (Makila, 2004; Osogo, 1966; Wagner, 1970). The disparities among some 'dialects' are so extensive, that mutual intelligibility is rendered very minimal among them. In other scenarios however, the differences are very scanty thereby paving room for a high mutual intelligibility among the 'dialects' in question (Chambers & Trudgill, 1980). Lubukusu for instance, displays sharp phonological and lexical variations from Lulogooli such that there is very little intelligibility between them. Olukhayo is regarded intelligible to Lubukusu, Lulogooli, Lusamia, Lunyala and Lumarachi (Muhindi, 1981). Undisputedly, this research study treated Olukhayo as a language since it is characterized by unique phonological, semantic and morphological features that make it quite distinct as compared to the others. Olukhayo is spoken by the Bakhayo people found in Busia County of the Western region of Kenya (Angogo, 1980). Busia is located at the extreme Western border of the Country. The county borders Bungoma to the North, Kakamega to the East, and Siaya to the South East, the Lake Victoria to the South West and the Republic of Uganda to the West. It lies between latitude 0° and 0° 45 North and longitude 34° 25 East and covers an area of $1694.5km^2$ (KNBS, 2019).

According to Lyons (1977) and Palmer (1981), the discussion of meaning often entails drawing a distinction between the 'reference' of a word and the 'sense' of a word. Reference is in fact viewed as an external meaning relation; it is the relationship between a word and the entity that it refers to in the physical world, in our mental world or in the world of our experiences. A 'tree' would for example be treated as, a plant with a trunk, branches, twigs, leaves and roots. However, this study will explore meaning from the dimension of sense. Sense is regarded as an internal meaning relation that holds between words within the vocabulary of a language, encompassing the speakers' knowledge of their language, factors that one needs to consider while developing an adequate semantic model. Furthermore, Lyons (1968) observes that the sense of a lexical item constitutes its position within a set or network of relations with other lexical items in a language. Additionally, Palmer (2000) opines that the sense of a word is revealed via the relationships of meaning the word manifests with other lexemes in the vocabulary of a language. Lexical items are not only regarded as 'containers' (container theory of meaning) or as participating in semantic roles; they display certain relations. For example, in the sentence, '**Manyasa** wrote **a letter** to **Nafula**,' we can have semantic roles: **agent**, **theme** and **goal** as per the boldfaced parts of the sentence respectively (Onwukwe, 2015).

In a nutshell, **sense relation** is a phrase which addresses the nature of semantic relations involving words or lexical items of a language in a given domain or field of meaning. There are two levels of meaning relations namely; word and sentence levels. The former entails meaning relations of individual words or lexemes. This study assessed and treated both levels of meaning relations as **lexical units** or **items**. In precision, the agglutinative phenomenon of Bantu languages renders Olukhayo analyzable from this linguistic perspective. The linguistic feature of agglutination is extensively evident in Olukhayo lexical items (lexemes). Consider the following examples for more insights in regard to this matter;

a) Natasha **yatsiaingo**.
   Natasha **went home**

b) Abana **balakulirwa** tsingubo.
   The children **will be bought** dresses.

The expressions 'yatsiaingo' [she went home] and 'balakulirwa' [they will be bought] are apparently single words at face value. A closer study or examination, however, clearly reveals both as sentences. As a result, our resolve to treat words, phrases, clauses and or sentences in Olukhayo corpus as lexical items (lexemes) for analysis, stems from this rationale as governed by the morphosyntactic properties of Olukhayo.

1.1 Research Objective

To establish the typology of sense relations in Olukhayo lexical items.

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II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Lexical Priming Theory

The theory of Lexical Priming proposed by Hoey (2005) avers that every lexical item is primed to be functional in both spoken and written language owing to the cumulative effects of a language user's prior encounter with or exposure to the lexical item. When one hears or reads a word, one normally tends to subconsciously keep a record of its collocations, colligations, semantic associations, pragmatic associations, textual collocations, the genre and or the style it is used in. Lexical Priming theory draws a link between Corpus Linguistics (lexis) and Psycholinguistics (priming). Khamkhien (2015) argues that speakers of a language subconsciously take note of the lexical items they come across along with their linguistic contexts whether in written or spoken discourse. Thus the theory sufficiently, informed our study of sense relations in Olukhayo.

2.2 Empirical Review

Hurford et al. (2007) regard the concept of sense as a semantic relationship that characterizes lexical items or expressions in a language. Cruse (2004) organizes lexical relations into two broad categories: identity and inclusion, and opposition and exclusion. Those that express identity and inclusion entail notions such as synonymy, homonymy, polysemy and hyponymy. Those that express opposition and exclusion include antonymy, complementaries, reversives, converses, and incompatibility. Paradigmatic and syntagmatic relations of words are usually taken to be the dominant sense relations (Lyons, 1995). The co-existence of more than one meaning in one word leads to a difficulty in determining whether a word is polysemous or homonymous. Thus, homonymy is regarded as a relation where a term may mean two or more different things (Katz, 1972; Kempson, 1977). Conversely, polysemy is seen as a lexical relation in which one term names others closely related in meaning. Fromkin & Rodman (1998) treat metonymy as the meaning relation that holds between two lexical items in which one of the lexical items is used metaphorically to substitute for the other in certain linguistic circumstances to convey similar meaning. Fromkin et al. (2011) opine that synonyms are words or expressions that bear similarity of meaning in some or in almost all contexts.

Lyons (1968) considers antonymy as a lexical relation where two words or expressions exhibit oppositeness of meaning. Further, antonymy is regarded as another traditional category of 'relatedness of meaning.' A number of scholars have addressed the notion of antonymy in light of its various contrasts. Complementary (binary) antonyms define a very basic form of opposition and manifest the property of binarity. Examples include: rise; fall, right; wrong, give; take, remove; return, exit; enter. Contrary to gradable antonyms, complementaries cannot co-occur with or be modified by the intensifiers. Besides, they cannot be inflected for both the comparative and superlative degrees (Cruse, 2004; Fromkin et al, 2011).

Secondly, we have reversives as a kind of contrast in antonymy. They are classified under directional opposites. Examples include words such as east: west, up: down (Cruse, 2004). Reversives may also indicate a movement in the opposite directions as in fall: rise, enter: exit. Furthermore, the notion reversives may also refer to any procedure that can have a reverse order as in pull and push; remove and add (Saeed, 2005). Another level of contrast in antonymy entails the converse pairs or relation antonyms. Examples include: above: below, own (Cruse, 2004). In a nutshell, if A is above B, then B is below A.

Geeraerts (2010) treats gradable antonyms as a type of contrast in antonymy. Examples here include pairs such as: wide: narrow, hot: cold, weak: strong, long: short. Gradable antonyms can be graded along a continuous spectrum. The antonym pairs inflect for both comparative and superlative degrees. Further, denial of one entity does not necessarily imply the assertion or endorsement of the other. There are usually other possibilities or intermediaries that fall between the two end points or extremes of a given pair. For example, the pair hot and cold can have: warm, tepid, lukewarm, cool and freezing. Intensifiers may also be used to qualify some antonym pairs (e.g. extremely cold).

We can also talk about multiple taxonomies (taxonomic sister antonyms) as a category of contrast in antonymy. This kind is also referred to as incompatibility. Incompatibilities refer to lexemes which indicate categories that are without any members in common (i.e. disjunct). They describe words which are on the same level in taxonomy hence incompatible. Word A is a taxonomic sister of word B if and only if word A and word B are hyponyms of all the same words (Crystal, 2008). Thus, if something is a rat, definitely, it is not a cat or leopard or cheetah; an entity can never belong to two classes at the same time.

In another study, Aunga (2011) explored the status of homonymy and polysemy in EkeGusii, a Bantu language in Kenya. This research initiative sought to identify and analyze homonymy and polysemy in EkeGusii. It is worthy to note that sense relations are problematic and confusing in respect of studies conducted on the Indo-European family of languages like English. The study sheds light on EkeGusii words that bear more than one sense as well as the extent to which polysemy and homonymy are at variance. The study employed the Sense Relations theory. Furthermore, the research adopted the qualitative design, and interview schedule in data extraction. Sampling was through purposive

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judgmental technique. This study focused on EkeGusii, making it different from this one. The other difference lies in the theoretical framework used. It is, however, similar and informative to this in the choice of methodology.

Rasekh et al. (2012) researched on homonymy in Qur'an. The study attempted to provide an overview of the theoretical issues as pertains homonymy in general and specifically the different senses of the term 'fasad' (corruption) in the Qur'an, along with its equivalents in sixteen well known English renderings. The study also aims at determining the extent of translators' success in avoiding ambiguity. The findings suggest that faced with the challenge of cultural and linguistic relativity, translators fail to account for the delicate sense offshoots of the term 'fasad' and its derivations. Our study however, did not explore the issue of translation. Nevertheless, the insights gained on homonymy effectively informed our research endeavour.

Seyyed et al. (2013) studied lexical sense relations through the application of linguistic knowledge, cognitive processes in colloquial speech and word association tests. Sampling was done through purposive judgmental technique. The study identified lexical relations such as: attributive, functional, socio-cultural, synonymy, collocation, place, meronymy, need relation, instrumental, semantic opposition, causal relation and hyponymy. The highlights based on this research are informative to this research endeavour, precisely, pertaining the objective on typology of sense relations, and in the choice of methodology; the use of purposive judgmental technique.

Malande (2011) posits that Lulogooli personal names have both denotative and connotative meaning. In essence, Lulogooli personal name formation is semantically motivated. Semantics regards signs as having meaning within the larger system of language. The system of signs is comprised of complex sense relations that exist between one sign and other primary relations of contrast and super-ordination/subordination (synonymy, homonymy, antonymy, metonymy and hyponymy). The researcher adopted the semiotic and generative morphological theory. The study is similar to the proposed one in that it partly addresses meaning from the dimension of sense relations. Our point of departure is in the choice of theory (LP), scope and limitations.

Cheng (2016) investigated lexical sense relations from the perspective of vocabulary breadth and word frequency. The study sought to investigate the impact of vocabulary size on the learners' acquisition of L2 lexical sense relations under classroom circumstances. The researcher gives highlights on four association types: paradigmatic, syntagmatic, derivational, spelling and pronunciational. The study revealed that Chinese adult L2 learners have the tendency to approach L2 words semantically, and vocabulary size and word frequency do affect L2 learners' association types. Students are generally inclined to connect words in terms of sense relations especially the paradigmatic ones. The proposed study stands to gain from this one in the sense that it addresses the typology of sense relations. The point of departure rests in the fact that it is based on L2 learners' word meaning relations; the intended one focuses on the native speakers of Olukhayo. Besides, the reviewed study uses WAT while ours, the interviews and questionnaires.

Deignan and Potter (2004) carried out a corpus study of metaphor and metonyms in English and Italian languages. The scholars used large computerized corpora to investigate the extent to which conceptual metaphor theory can account for the non-literal senses of words drawn from the semantic field of human body. Metonymy has a very strong bearing in the production of non-literal expressions. The research employed conceptual metaphor theory, making it different from this one. However, it informs the current study in its foci on lexis and specifically in regard to the insights rendered on non-literal meanings about interactions of metonymy with metaphor.

III. METHODOLOGY

The research study was conducted in Matayos Division of Busia County. The choice of this region was motivated by the fact that it comprises the majority of Olukhayo native speakers (Were, 1967; KNBS, 2009). It is therefore, highly likely to yield both authentic and intelligible data. The study adopted the descriptive research design. This approach is critical in dealing with qualitative data. Ideally, it consists in providing systematic, descriptive and explanatory accounts of data; as is the case with categories or classes of lexical items. As a matter of fact, peoples' behavior is best accounted for through the qualitative approach (Mugenda & Mugenda, 1999). The study targeted a total of 650 lexical items. The target population of the informants drawn from Matayos Division: Matayos South, Bukhayo West and Busibwabo wards was approximated at 142,408 persons (KNBS, 2019).

This study placed the confidence level at 95% and the confidence interval at ± 5 which translated to a sample size of 384 respondents. Using purposive sampling procedure, the study identified candidates who were proficient in both the spoken and written Olukhayo. Consequently, the sample population was further reduced deliberately to a more manageable, meaningful and effectively representative size of 40 informants. The study sought lexemes drawn from the grammatical word classes. Those identified as key informants were requested to name others who they believed could impact positively the research initiative. The researcher engaged informants proficient in Olukhayo in the elicitation of data. Questionnaires were used in data extraction procedure.

The analysis of data drew on the tenets of Lexical Priming theory. Lexical items do not occur in isolation; they manifest or display certain links or networks that are semantically motivated. The nature of such links bring to light

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semantic realities of collocations, semantic associations and colligations. A thorough scrutiny of the nature of semantic interrelationships and their categorization among the lexical items in Olukhayo, provided for the semantic relations such as: polysemy, synonymy and metonymy etcetera.

IV. FINDINGS & DISCUSSION

The research study sought to establish the typology of sense relations in Olukhayo. Thus a total of 392 lexical items were extracted for an in-depth analysis. The identified lexemes were further coded on the basis of their various word class categories. Besides, a closer examination of the lexemes was carried out so as to investigate the nature of sense relations that held among them. Nevertheless, in circumstances where it was felt the respondents' data was inadequate, the study drew on the knowledge of native speaker competence to supplement additional information for the needs of this study. The data on Olukhayo yielded a number of lexical sense relations namely: polysemy, synonymy, antonymy, hyponymy, homonymy and metonymy. The data on Olukhayo yielded a number of lexical sense relations namely: polysemy, synonymy, antonymy, hyponymy, homonymy and metonymy. Lexical items do not usually occur in isolation. They, as a matter of fact, display links with one another or simply occur in networks of semantic inter-relationships. A detailed discussion of each identified sense relation is provided below.

4.1 Polysemy

The senses of a polysemous word differ in terms of their collocations, semantic associations and colligations (Hoey, 2005). Ideally, polysemous words display an element of sense relatedness among the offshoots of meaning conveyed. It is important, however, to note that sense variations in Olukhayo words are governed by the nature of semantic associations, colligations and collocations of each word within the discourse context. This appropriately applies to the numerous examples involving the identified grammatical divisions of N, V, Adj and Adv. The nominal word, 'esidiki' may for instance be used to mean: a milking pen, a cage or trap, a jail or prison. Another example is of the verb, 'fuka' used to mean: cook or row. The Adjective word, 'bala' is used to mean: hot, chaotic or volatile. Consider the analysis of the lexeme 'esidiki' in the sentences below:

a) Yombakha esidiki sia tsing'ombe.
   S/he built a pen for cows
   S+ V+ esidiki + PP
   CCs: milking pen, cows' pen
   SAs: dairy, livestock, farm, structure

b) Esidiki siadira eliyoni.
   The trap caught a bird.
   Esidiki + V+ O
   CCs: birds' trap, birds' snare, birds' cage
   SAs: animals, birds, rear, catch, hunt

4.2 Synonymy

Synonyms are words or expressions that reflect a similarity of senses in some or almost all contexts (Fromkin et al., 2011). Synonyms display variations in terms of their collocations, semantic associations and colligations. Each term is primed to mean something owing to its frequent associations. The analysis of synonyms in Olukhayo was systematically conducted across the word categories. Notably, the data on Olukhayo nouns, Verbs and, Adjectives indicated cases of absolute synonyms as well as near synonyms. Thus, the sets of synonyms display a similarity of the lexical sense though not in every discourse encounters. Examples of absolute synonyms in Olukhayo include: the words, 'amakobi and amadeni' which are used to mean debts. A similar example comprises the words: 'omuyonga and omuyale' used to mean soot. The synonymic set, 'amaki and amabuyu' is, on the contrary, is a good example of near or partial synonymy. Both words generally refer to eggs. However, the former is specifically used to mean eggs laid by insects while the latter eggs laid by birds and or animals. Consider the analysis of the lexemes amaki and amabuyu below:

a) Joan yakula amabuyu.
   Joan bought eggs.
   S + V + amabuyu
   CCs: chicken eggs, lay eggs, fried eggs, egg yolk
   SAs: birds, chicks, proteins, food, shells, break, crate

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b) Etsinda tsireranga amaki.
The lay eggs.
Etsinda + V + O
CCs: lice eggs, hatch eggs
SAs: insects, dirt, hair, clothes, irritation, bites, suck, blood

4.3 Antonymy

Antonymy is a term used to describe the kind of sense relation that holds between and or exists among words that stand in semantic opposition. Antonymy reflects a relationship of oppositeness in the senses of lexemes. The data on Olukhayo lexis manifested variants of the antonymic sense relation such as: reversives [directional] 'masaba – mulambo' (north – south), [motion] 'tsia – itsa' (go – come) and [process] 'dekha – dekhulula' (marry– divorce); converse/relation 'kula– kusia' (buy – sell); gradable 'khongo – didi' (big/large – small/little) and binary/complementary 'obukesi – obusiru' (bravery – foolishness). The analysis of the set 'dekha – dekhulula' is as follows:

a) Naliaka yadekha Nyeri.
Naliaka is married in Nyeri.
S + Aux [BE] + dekha + A
CCs: to marry, marry someone, married to
SAs: bride, bridegroom, dowry, family

b) Naliaka anyala khudekhulula.
Naliaka can divorce her husband.
S + Aux [Modal] + khudekhulula
CCs: divorce wife, divorce husband
SAs: marriage, strife, conflicts, family

4.4 Homonymy

Homonymy entails different and unrelated senses or meanings borne by the same morphological form of words (Fellbaum, 2000). Homonyms usually bear identical spelling, however, with a difference in the meanings conveyed. Homonyms can further be divided into homographs (identical spelling and different senses) and homophones (different spellings with similar pronunciation). The data on Olukhayo did not, however, render itself analyzable in regard to the latter division of homonyms. The analysis addressed the noun, verb and adjective categories. The word 'tsisala' is for example used to refer to fellowship prayers especially by the Catholic faithful. It is also used to capture the plural sense of the word 'stick' in Olukhayo. Another example includes the word 'elikulu' which has senses such as: heaven, sky, thunder and the blue pigment. The analysis of the lexeme 'tsisala' below clarify this point.

a) Yafunaka tsisala tsiosi.
S/he broke all sticks.
S + V + tsisala + Det
CCs: sharp sticks, thick sticks, cassava sticks, curved sticks
SAs: plants, boundary markers, cuttings, canes, spikes

b) Asomanga tsisala.
S/he is reading Psalms.
S+ Aux + V + tsisala
CCs: read Psalms, prayers with Psalms
SAs: Prayers, Catholicism, fellowship

4.5 Metonymy

Metonymy plays a critical role in the generation of words that portray non-literal meanings. The discussion and analysis of data revealed three types: part for whole relations, whole for part relations plus the metonyms derived from lexeme sense associations.

4.5.1 Part-Whole Relations

The analysis of data on Olukhayo generated a large number of part- whole relations drawn mainly from the semantic field of human body parts. The phrase 'omurwe mwangu' with the literal translation 'light head' has the non-literal sense of 'sharp or quick witted.' Conversely, 'omurwe musiro' literally translated as 'heavy head' points to the non-literal or connotative sense of 'dull or daft.' Additionally, the expression 'mberesie amabeka' loosely translated as;

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'give me shoulders' is used with a stylistic sense to dismiss or order a person to leave a place immediately. Consider the analysis of this metonym as follows:

Omusatsa oyo yaruberesia amabeka.
That man was ordered to leave immediately.
S + beresia amabeka.
CCs: give ones' shoulders
SAs: directive, orders, dismissal, commands, harsh tone

4.5.2 Whole for Part Relations

The sense relations identified under this category were mostly drawn from the semantic field of domestic life in addition to elements of weather and or nature. It is worth noting that a number of whole for part relations can possibly generate non- literal senses. Consider: "Joyce yakwa mulusiba," (Joyce fell deep into water). This sentence can be interpreted with a metaphoric sense to imply that Joyce leads a very miserable life or further still, a life characterized by misfortunes. The context of application, however, makes it clear what Olukhayo speakers actually imply. In another scenario: "Joyce akosisie ing'ombe yae yamabere," (Joyce has lost her dairy cow). Besides the literal import, the statement could also be used to mean that Joyce is bereaved of a close friend or family member who doubled up as the sole breadwinner. The analysis of the example below is based on the tenets of LP theory.

Joyce yakosia ing'ombe yamabere.
Joyce lost her dairy cow
S+ kosia ing'ombe yamabere
CCs: dairy cow, milk cow, cow's milk
SAs: livestock, milk, breeds, wedge-shaped, breadwinner

4.5.3 Lexical Sense Associations

A good number of metonyms in Olukhayo bring to light what we may describe as 'lexical sense associations.' Olukhayo lexis is largely characterized by a wide range of collocations and semantic associations that reflect metaphorical or rather stylistic senses in a variety of linguistic discourses. A large number of expressions are associated with or used to imply specific senses. Examples in this regard include phrases such as: 'nyola omudekhi 'has a literal interpretation of 'find or get a cook.' It is however used to mean 'marry or get a wife.' Consider the phrase 'bwana omuliro,' it refers to the process of lighting fire. It is nonetheless used to highlight the sense of incitement or trouble making, which may become chaotic or escalate beyond control. The example on the lexeme 'muliro' is analyzed as follows.

Obinda yabwana omuliro.
Obinda lit fire.
S + bwana omuliro
CCs: light a fire, put out fire
SAs: cook, kitchen, food, light, incite, catalyze, cause trouble

4.6 Hyponymy

Hyponymy refers to a sense relation that is defined by the linguistic feature of inclusivity; the meaning of one word is included in another. In this discussion, we seek to address the notion of multiple incompatibilities (taxonomic sisters) in respect of co-hyponyms in Olukhayo. Language users store words according to the contexts in which they encounter them (Hoey, 2005). Ideally, words in any language belong to specific semantic fields or domains as mirrored in day to day discourse instantiations. A relationship of incompatibility is noticeable among co-hyponyms that fall under similar superordinate cover term. The members under any superordinate term are in mutual exclusion of one another. It is observed that co-hyponyms are at variance in their senses as defined by typical collocations, semantic associations and colligations (Hoey, 2005). Olukhayo has a range of words used to describe the notion of colour (obukondo) such as: namuki (yellow), elikulu (blue), indafu (white), inzakhanyu (red), majani (green) nasilobaloba (brown), and nasikokhakokhe (grey) among others. The analysis herein highlights the concept of hyponymy in Olukhayo as governed by LP theory.

Yafwala ingubo indafu.
S/he dressed in a white attire.
S+ V + O + indafu
CCs: white colour, white dress, white clouds, white light
SAs: cleanliness, holiness, light, clear, transparency, truth

The table, pie chart and graph below give a summary of the typology of sense relations in Olukhayo vocabulary.

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Table 1. ***Typology of Sense Relations in Olukhayo***

S/No.	Sense Relation	Frequency Counts/ Category					Total
		N	V	Adj.	Adv.	P	
01.	Polysemy	20	20	10	-	-	50
02.	Synonymy	15	15	14	05	-	49
03.	Antonymy	13	19	17	06	02	57
04.	Homonymy	17	17	03	-	-	37
05.	Metonymy	-	-	-	-	-	**124**
06.	Hyponymy	66	-	9	-	-	75
Total		**131**	**71**	**53**	**11**	**02**	**392**

NB: The table gives a summary of frequency counts and or word classes in view of sense relations in Olukhayo corpus.

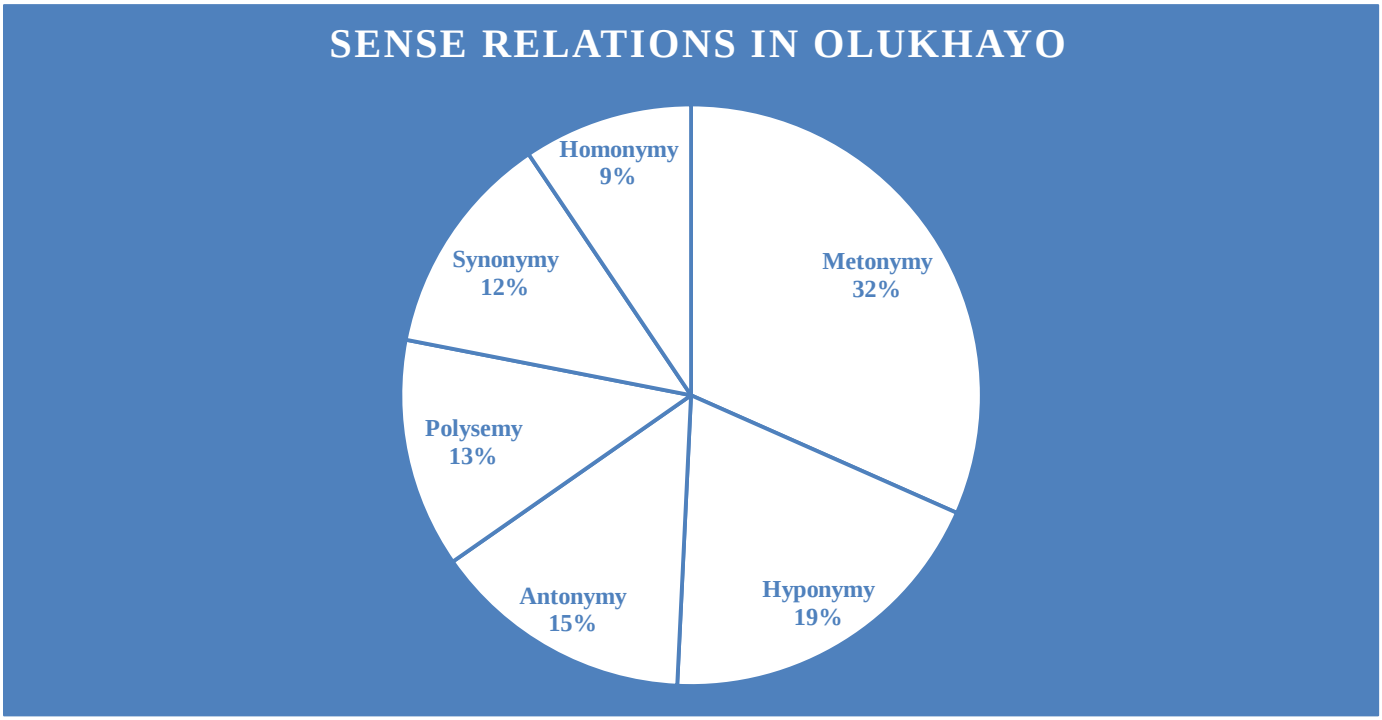

Figure 1
Sense Relations in Olukhayo

NB: The pie chart shows percentages of frequency distributions of various sense relations in Olukhayo data.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This research set out to determine the typology of sense relations in Olukhayo language. The analysis of corpus data mirrored semantic features of collocations, colligations and semantic associations in respect of each and every lexical item studied. Indeed, lexical items displayed secondary senses besides their primary ones; indicative of the semantic notion of sense extrapolation with Olukhayo lexemes. Metonymical relations assumed the highest frequency of occurrence relative to the other relations in Olukhayo lexis. Homonymy on the one hand pointed to the least frequency of occurrence in Olukhayo corpus. Further, sense relations were notably conspicuous in the Noun, Verb and Adjective word categories. They were, however, least noticeable in the Adverb class. The study answered our question in the sense that lexical items in Olukhayo data portrayed a number of sense relations namely: synonymy, polysemy and antonymy; homonymy, metonymy and hyponymy. This discussion has dealt with the typology of sense relations in Olukhayo language. Sense relations, essentially, inform the teaching, learning and acquisition of vocabulary in a language.

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5.2 Recommendations

It was pointed out in our preliminary section the grave concern about lack of literature in print in Olukhayo. Thus, it is important to recommend that literature materials are availed on Olukhayo and or other languages by those with a passion for writing and publications. Indeed, one of the recommendations of the Competency Based Education (by the Ministry of Education) concerns the need to teach vernacular languages in lower primary schools in upcountry regions. It is equally vital to make a further recommendation that curriculum developers as well as the editors and publishers of the teaching and learning materials (for local dialects and or languages) and the instructors should consider the role of sense relations in vocabulary acquisition, for effective pedagogical practices in language teaching and learning.

REFERENCES

Angogo, R. (1980). *Linguistic and attitudinal factors in the maintenance of the Luhya–group identity* (Unpublished PhD thesis). University of Texas, Austin.

Aunga, S. (2011). *The nature of homonymous and polysemous relations in EkeGusii* (Unpublished master's dissertation). Kenyatta University.

Trudgill, P., & Chambers, J. K. (1980). *Dialectology*. Cambridge University Press.

Cheng, X. (2016). A study on sense relations from the perspective of vocabulary breadth and word frequency. *Theory and Practice in Language Studies, 6*(5), 998–993.

Cruse, D. A. (2004). *Meaning in language: An introduction to semantics and pragmatics* (2nd ed.). Oxford University Press.

Cruse, D. A. (2011). *Meaning in language: An introduction to semantics and pragmatics* (3rd ed.). Oxford University Press.

Crystal, D. (2008). *A dictionary of linguistics and phonetics* (6th ed.). Malden, MA: Cambridge University Press.

Deignan, A. P., & Potter, L. (2004). A corpus study of metaphor and metonyms in English. *Italian Journal of Pragmatics, 36*, 123–1252.

Fellbaum, C. (2000). Autotroponymy. In Y. Ravin & C. Leacock (Eds.), *Polysemy: Theoretical and computational approaches* (pp. 52–67). Oxford University Press.

Frege, G. (1892). Sense and reference. *University of Jena Journal, 19*, 25. [Note: Original author was Gottlob Frege, not Gottlob F.; journal and citation adjusted for accuracy.]

Fromkin, V., & Rodman, R. (1998). *An introduction to language* (6th ed.). Harcourt Brace.

Fromkin, V., Rodman, R., & Hyams, N. (2011). *An introduction to language* (9th ed.). Wadsworth: Cengage Learning.

Geeraerts, D. (2010). *Theories of lexical semantics*. Oxford University Press.

Hoey, M. (2005). *Lexical priming: A new theory of words and language*. Routledge.

Hurford, J. R., Heasley, B., & Smith, M. (2007). *Semantics: A coursebook* (2nd ed.). Cambridge University Press.

Katz, J. (1972). *Semantic theory*. Harper & Row.

Kempson, R. (1977). *Semantic theory*. Cambridge University Press.

Kent, J. (2008). An overview of lexical semantics. *Philosophy Compass, 3*(1), 119–134.

KNBS. (2019). *Kenya population and housing census* (Vol. 14). Kenya National Bureau of Statistics.

Khamkhien, A. (2015). Review of Lexical Priming: A New Theory of Words and Language. *Electronic Journal of Foreign Language Teaching, 12*(1), 135–138.

Lyons, J. (1968). *An introduction to theoretical linguistics*. Cambridge University Press.

Lyons, J. (1977). *Semantics*. Cambridge University Press.

Lyons, J. (1995). *Linguistic semantics: An introduction*. Cambridge University Press.

Maho, J. F. (2009). The online version of the new updated Guthrie list: A referential classification of the Bantu languages. http://goto.glocalnet.net/mahopapers/nuglonline

Makeni, B. (2006). *Acquisition of concordial morphemes by Lukhayo speaking pre-school children* (Unpublished master's thesis). Kenyatta University.

Makila, F. E. (2004). *Bukusu cultural traditions*. Nairobi: Kenya Literature Bureau.

Makokha, J. (2013). *Phonological variations in Lukhayo dialect of the Luhya language in Kenya* (Unpublished master's dissertation). Kenyatta University.

Malande, J. M. O. (2011). What is in a name? An analysis of the semantics of Lulogooli personal names. *International Journal of Humanities and Social Science, 1*(20), 211–218.

Mugenda, O., & Mugenda, A. (1999). *Research methods: Quantitative and qualitative approaches*. Acts Press.

Muhindi, P. (1981). *A phonological contrastive survey of English and Lulogooli dialect and its implications for the teachers of English* (Unpublished master's thesis). University of Nairobi.

Onwukwe, C. (2015). Homonymous relationship of verbs of cooking in Igbo. *International Research Journal of Arts and Social Science, 4*(3), 61–69.

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Osogo, J. (1966). *A history of Abaluhya*. Nairobi: Oxford University Press.
Palmer, F. R. (1981). *Semantics*. Cambridge University Press.
Palmer, F. R. (2000). *Semantics* (2nd ed.). Cambridge University Press.
Pustejovsky, J. (1995). *The generative lexicon*. MIT Press.
Quine, W. V. O. (1953). *From a logical point of view*. Harvard University Press.
Rasekh, A., Hossein, V., & Bassir, A. (2012). Homonymous expressions in the Qur'an: A case study of the English translations of the term (Fasad). *The Journal of International Social Research, 5*(22), 137–148.
Saeed, J. L. (2005). *Semantics* (2nd ed.). Blackwell Publishers.
Seyyed, M., Elahm, A., & Shima, E. (2013). An assessment of lexical sense relations based on word association test. *European Scientific Journal, 9*(11).
Wabwire, V. (2010). *The structure and function of Olukhayo noun phrase: An X-bar perspective* (Unpublished master's dissertation). Kenyatta University.
Wagner, G. (1970). *The Bantu of Western Kenya* (Vol. 1). Oxford University Press.
Were, G. (1967). *A history of the Abaluhya of Western Kenya*. Nairobi: East African Educational Publishers.
Williams, J. (1973). Sub-grouping of the Luhya group. Paper presented at the Fourth Annual Conference on African Linguistics, SUNY, New York.
Wittgenstein, L. (1953). *Philosophical investigations*. Blackwell.

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The contribution of Islam to the development of education in Kakamega County, Kenya: A case study of Kakamega Muslim Secondary School, 1983–2023

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ABSTRACT

This study is set to examine the contribution of Islam to the development of education with special reference to Kakamega Muslim Secondary School, Kakamega County, Kenya. This study cramped itself to a period between 1983 and 2023; 1983 marked the establishment of the school, as it provides a logical starting point for examining its historical development. The 40-year span allowed for a comprehensive analysis of the school's growth, contributions, and challenges over time. Ending in 2023 captured the most recent developments and ensured the availability of reliable data from the school records, policy documents, and living witnesses. What prompted the documentation of this study was the limited understanding of how Islamic education shaped educational progress in Kakamega County. While tracing the historical foundations of the school, the study was guided by the following objectives: to trace the historical development of Kakamega Muslim Secondary School, to examine the contribution of Islam to the development of Kakamega Muslim Secondary School, and lastly, to assess the impacts of Kakamega Muslim Secondary School alumni on the community. This study was guided by policy historiography by Trevor Gale, as it helped to examine how historical and socio-political contexts shaped education in KMSS. This research also employed a historical research design, which was a qualitative approach. Due to the historical nature of this research, it employed both primary and secondary sources of data collection in order to get firsthand information. This research, however, relied on primary sources that included document analysis and interview guides that were done orally, as this helped to provide valuable insights into the role of religion in shaping the institution by emphasizing the importance of community support, religious values, and leadership in fostering the development. The target population involved the community, parents and students, the alumni, and the school administration, who were sampled using purposive sampling. These data collection processes were used to comprehend the Islamic teachings in influencing moral and ethical education by showing how the curriculum inculcated with Islamic values provided not only secular and religious education but also, in addition, the role of Muslim organizations such as religious endowments and charity donations in promoting growth and development of the school. Archival data were produced by the method of thematic analysis. This allowed to confirm information gathered via interviews by eyewitnesses. The verified data was then analyzed and presented qualitatively under themes with special reference to study objectives. In conclusion, this research demonstrated that the contribution of Islam to the development of Kakamega Muslim Secondary School played a pivotal role in ensuring its success as a center of both academic and religious learning, benefiting the local Muslim community and beyond. From the findings, the study recommends the Ministry of Education, the Muslim community, and the school administration ensure that they preserve the Islamic culture while teaching IRE, encourage active community involvement, preservethe school's Islamic heritage, and provide government recognition and support for faith-based institutions in national education.

Keywords: Educational Development, Islamic Education, Kakamega Muslim Secondary School, Kenya

I. INTRODUCTION

Education has consistently been recognized as both a tool of personal empowerment and a driver of social transformation. In Kenya, education has historically reflected the country's encounters with diverse cultural and religious influences African indigenous systems, Christian missionary schooling, colonial policies, and, importantly, Islamic traditions (Sifuna, 1990; Bogonko, 1992; Otiende & Sifuna, 1994). Each of these systems has shaped not only how knowledge was transmitted but also how values, identities, and aspirations were cultivated across generations. Yet within scholarly and policy discourse, the contribution of Islamic education has often been underexplored, particularly in regions such as Western Kenya where Christian missionary dominance and state policy overshadowed Muslim

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initiatives (Nasimiyu, 2000; Isaack, 2018).Islam places an unparalleled emphasis on learning, considering it both a spiritual duty and a social responsibility. The first Qur'anic command to "read" (Qur'an 96:1) highlights the centrality of knowledge in Islamic life, while prophetic traditions affirm that seeking knowledge is obligatory for every believer (Brown, 2013; Maidugu & Sadeeq, 2024). Historically, Islamic education has not been limited to religious instruction. It has embodied a holistic vision, integrating spiritual, intellectual, and moral growth through systems such as madrassas and Qur'anic schools, which became vital institutions across Africa (Hall, 2011; Kane, 2016). In this sense, Islamic education resonated with African indigenous systems, which also prioritized moral training, community responsibility, and oral traditions of knowledge transmission (Mashic, 2009; Ocitti, 1966).

The spread of Islam into Africa from the seventh century reshaped cultural and educational landscapes. In West Africa, trade networks linked Islamic scholars with local rulers, leading to the establishment of renowned centers such as Timbuktu (Reese, 2014; Sanneh, 2015). Islam reached East Africa on the Swahili coast by at least the eighth century, and later spread inland from the influence of commerce, migration, and cultural interaction among individuals (Nobili, 2020; Mazrui, 2014). In Western Kenya, Nabongo Mumia of the Wanga kingdom was at the center of welcoming Muslim traders and, in the process, opening the way for the addition of Islam among local societies (Osogo, 1966; Mulaa, 1981; Oded, 2000). The historical pattern thus underlines that Islam was not merely a religious importation but a cultural movement that overlapped with indigenous regimes and colonial contact. The colonial period greatly disturbed the balance between Islamic and other school cultures. Christian mission schools, with the aid of colonial government, became the leading dispensers of official education (Anderson, 2005; Sheffield, 1973). Their education focused on literacy, Christian instruction, and European value systems, sometimes sidelining indigenous and Islamic practices (Wanjohi, 2011; Porter, 2004). In spite of the Muslim protest against aspects of missionary education due to the pursuit of maintaining identity, they simultaneously began to update madrassas by including secular disciplines in order to keep up in the rapidly changing world (Isaack, 2018). The period thus spurred the development of Islamic education in Kenya from Qur'anic schools of an informal nature to integrated schools combining religious and secular education (Adan, 2013; Møller, 2006).

After independence in 1963, Kenya's education system underwent reforms aimed at fostering national unity, expanding access, and aligning education with socio-economic development (Republic of Kenya, 1964; 1986). The introduction of Islamic Religious Education (IRE) into the national curriculum and the recognition of faith-based schools reflected an acknowledgment of Kenya's religious diversity (Muricho & Chang'ach, 2013; Inyega et al., 2021). Yet, while Christian-sponsored schools often benefitted from greater visibility and resources, Islamic institutions still struggled with policy neglect and resource disparities (Isaack, 2018; Nasimiyu, 2000). Within this context, the establishment of Kakamega Muslim Secondary School (KMSS) in 1983 represented a significant milestone for the Muslim community in Western Kenya.KMSS is the creation of local Muslims, which is formed based on practical and cultural requirements. On the one hand, Muslim children were denied access to quality secondary education because of their religion, which excluded them in denominational schools (Ochola, 2001). On the other hand, the increasing need in integrated curricula, uniting national standards and the Islamic values, demanded institutions capable of offering both academic quality and moral growth (Adan, 2013; Isaack, 2018). Through developing KMSS, the community aimed to secure continuity among graduates of primary Muslim schools, as well as aligning with the national vision of education as an instrument of development (Lelei & Weidman, 2012; Mackatiani et al., 2016).

KMSS story describes how the Islamic education has assisted Kenya to enhance its general education. KMSS is not only a learning institution but also a cultural heritage, moral teaching, community empowerment as a faith-based institution. The example of its curriculum reflects the idea of integrated learning, which combines secular and religious courses to raise all-round people ready to face national examinations and spiritual duties (Isaack, 2018; Maidugu & Sadeeq, 2024). With the help of communal assistance, beyond the classroom, the school has also received community support in terms of zakat (almsgiving), endowments, and alumni donations, as an example of how Islamic values of charity and solidarity can be used to sustain educational institutions (Bakari & Yahya-Othman, 1997; Ahmed, 2010).On a theoretical level, exploring the concept of KMSS in the light of the ideas of policy historiography by Trevor Gale makes it possible to understand the ways in which educational policies interrelate with social, cultural, and religious dynamics. According to Gale (2001), policies are not sets in stone but historically embodied discourses that are influenced by power, ideology and community reactions. Using this lens to analyze KMSS, it is possible to note that Islamic education has adapted to and opposed state policies to guarantee survival and relevance in the environment of structural inequalities (Creswell, 2018; Tracy, 2019). KMSS story explains how Islamic education has helped Kenya to improve its overall education. KMSS is not just a learning institution but a cultural heritage, moral teaching, community empowerment as a faith-based institution. The example of its curriculum reflects the idea of integrated learning, which combines secular and religious courses to raise all-round people ready to face national examinations and spiritual duties (Isaack, 2018; Maidugu & Sadeeq, 2024). With the help of communal assistance, beyond the classroom, the school has also received community support in terms of zakat (almsgiving), endowments, and alumni donations, as an example of how Islamic values of charity and solidarity can be used to sustain educational institutions (Bakari & Yahya-Othman, 1997; Ahmed, 2010).

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On a theoretical level, exploring the concept of KMSS in the light of the ideas of policy historiography by Trevor Gale makes it possible to understand the ways in which educational policies interrelate with social, cultural, and religious dynamics. According to Gale (2001), policies are not sets in stone but historically embodied discourses that are influenced by power, ideology and community reactions. Using this lens to analyze KMSS, it is possible to note that Islamic education has adapted to and opposed state policies to guarantee survival and relevance in the environment of structural inequalities (Creswell, 2018; Tracy, 2019). Despite its contributions, KMSS remains under-documented in educational scholarship, particularly compared to missionary-founded or elite state schools. This absence creates a gap in understanding how religious communities shape education in ways that complement, challenge, or transform national systems. By tracing KMSS's historical development from 1983 to 2023, this article seeks to address this gap. It examines three central questions: What were the historical factors that led to the establishment of KMSS? How did Islam influence the school's development over four decades? And what impact have its alumni had on the wider society? In exploring these questions, the article argues that Islamic education in Kenya, as exemplified by KMSS, has been integrative rather than oppositional, transformative rather than peripheral. KMSS illustrates how religious values, community agency, and national policies intersect to produce institutions that serve both local needs and national development goals. Far from being marginal, Islamic education has contributed significantly to academic achievement, moral development, and social cohesion in Kakamega County and beyond.

1.1 Statement of the Problem

Kakamega Muslim Secondary School has been in existence since 1983 and has played an important role in promoting education grounded in Islamic values. Yet, despite its impact on learners and the wider community, its contributions have not been well documented in either local or national educational records. In Western Kenya, public and Christian-sponsored schools tend to receive more visibility and government support, while Islamic institutions such as KMSS often operate with limited resources and little policy attention. This lack of recognition has made it difficult to fully appreciate how Islamic education has shaped the character, academic growth, and social contributions of learners in the region. Simultaneously, a significant portion of research about education in Kenya has failed to consider the impact of religion, in particular, Islam, on the development of schools and learner results. A lot of the work is conceptualized by secular or western theories, which cannot explain the lived experiences, cultural meaning, and values embedded in the institutions such as KMSS. However, the school narrative indicates that Islamic education has been the focus of academic success, moral instructions, and societal growth. This research paper thus attempts to address this gap by developing an interpretivist study methodology using Trevor Gale's policy historiography to trace the progress of KMSS through its historical, social, and policy contexts.

1.2 Research Objective

To explore the role of Islam in advancing education in Kakamega County, with reference to Kakamega Muslim Secondary School.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was based on the concept of policy historiography proposed by Trevor Gale (2001), which offers an idea of how the education policies develop and how they are influenced by broader social, cultural, and religious forces. Gale warns against perceiving policies as official texts but rather he presents them as historically contextualized forms of discourse that are influenced by power relations, ideological conflict and community bargaining. The view was especially applicable to the study of Islamic education in Kenya, and more specifically in the case of Kakamega Muslim Secondary School (KMSS). Within the policy historiography, the research followed the way the government policies, religious beliefs, and local efforts interplayed in the formation of Islamic education. The framework also demonstrated how institutions like KMSS reacted to the state policies at times by means of adjusting to them, at other times by defying or redefining them in both the colonial and postcolonial setting. Using the method of Gale, the research could question the construction of education at KMSS in terms of policy discourses, community agency and local interpretation. It also brought into focus the dynamics of inclusion and marginalization, raising critical questions about whose voices influenced educational development, how Islamic perspectives were either accommodated or excluded, and how Muslim communities in Western Kenya sought to reshape national education agendas in response to these pressures.

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2.2 Empirical Review

Education in Kenya has been shaped by diverse historical, cultural, and religious forces, yet the role of Islamic institutions has often been underexplored. Several studies trace the broader history of education, showing how colonial and post-independence reforms shaped access and equity. Sifuna (1990), Bogonko (1992), and Otiende and Sifuna (1994) emphasize that colonial education privileged Christian-sponsored schools while marginalizing Islamic and indigenous approaches. Sheffield (1973) and Anderson (2005) similarly note that missionary institutions dominated the education landscape, with Muslims often excluded or compelled to establish parallel systems of learning.

Empirical studies on Islamic education in Kenya highlight efforts by Muslim communities to integrate secular and religious knowledge. Adan (2013) records the case of the Islamic integrated schools in Garissa whereby they accommodated the teaching of Islamic Religious Education (IRE) alongside national curricula. Isaack (2018) follows the history of Islamic education since the colonial times to the current era without omissions in its endurance due to the lack of state appreciation and encouragement. Nasimiyu (2000) demonstrates the contribution of the Islamic institutions in Western Kenya that did not ruin the identity of the community because they promoted literacy as well as moral education. Such works demonstrate that Islamic schools like Kakamega Muslim Secondary School (KMSS) are a part of the wider trend in which Muslim communities seek the means to ensure that they are able to acquire education without having to sacrifice their religious beliefs and values. At a broader African level, Hall (2011), Kane (2016), and Sanneh (2015) demonstrate that Islamic education has a long history of intellectual tradition in West Africa and Mazrui (2014) and Nobili (2020) believe that Islamic scholarship has always adapted to different socio-political conditions. These findings provide some information on the Kenyan case, in which Islamic schools too must negotiate between modernity, tradition, and state policy.

The Kenya education reforms after independence studies illuminated further on the fate of minority faith-based institutions. According to Muricho and Chang (2013) and Inyega et al. (2021), there is the scope of how many reforms provided access but not based on the needs of Muslim students. Despite the fact that the outcomes continue to depend on political factors, curriculum reforms and resource allocation to the disadvantage of Islamic schools, the role of the Islamic education in the developments of Kenya is given little emphasis by Lelei and Weidman (2012) and Mackatiani et al. (2016) in general and KMSS in particular. This is a huge gap considering KMSS has delivered generations of graduates in the course of having served professional sectors, religious leadership and community development. The paucity of empirical research on KMSS has curtailed the knowledge of the role of Islamic values in influencing not just individual learners but also the entire society. The study addresses this gap by writing about the four-decade experience of KMSS and introducing a contextualized insight into the Islamic education literature in Kenya. Adan (2013) records the case of the Islamic integrated schools in Garissa whereby they accommodated the teaching of Islamic Religious Education (IRE) alongside national curricula. Isaack (2018) traces the history of the Islamic education since the colonial days to the present without missing any part of its survival because the state did not value and support it. Nasimiyu (2000) indicates the role of the Islamic institutions in Western Kenya which did not limit itself to promoting literacy and moral education at the expense of obliterating the community identity. These sources demonstrate that Islamic schools including Kakamega Muslim Secondary School (KMSS) are part of a larger trend of Muslim communities to ensure that they access the benefits of education without compromising their beliefs and values.Hall (2011), Kane (2016), and Sanneh (2015) reveal that Islamic education has a long intellectual tradition in West Africa, and Mazrui (2014) and Nobili (2020) argue that Islamic scholarship has always been able to adapt itself to different socio-political circumstances. The results provide us with some clues to the Kenyan situation, where Islamic schools are also forced to juggle between tradition, modernity, and state.

Research on education reforms in Kenya since independence illuminated more on the situation of the minority faith-based institutions. The scope of reforms to open access and not take the needs of Muslim students into account is also presented in Muricho and Chang (2013) and Inyega et al. (2021). Lelei and Weidman (2012) and Mackatiani et al. (2016) underline that the results continue to be dependent on political factors, curriculum restructure and resource allocation, which discriminate against Islamic schools.

Although these studies have emphasised the role of the Islamic education in developing Kenya, there is little emphasis on Western Kenya in general and KMSS in particular. This is a huge gap considering KMSS has delivered generations of graduates in the course of having served professional sectors, religious leadership and community development. The paucity of empirical research on KMSS has curtailed the knowledge of the role of Islamic values in influencing not just individual learners but also the entire society. The study addresses this gap by writing about the four-decade experience of KMSS and introducing a contextualized insight into the Islamic education literature in Kenya.

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III. METHODOLOGY

3.1 Research Design

The type of historical research design was used in this research to retrace the role of Islam in development of education in Kakamega County, and the Kakamega Muslim Secondary School, KMSS in particular. History design was suitable as it enabled the reproduction of past events and processes, and offered an understanding of how Islamic education influenced the development and the personality of the institution within forty years (Creswell, 2018). This method placed more emphasis on qualitative interpretation and was influenced by the policy historiography of Trevor Gale (2001), which places educational developments in the context of their broader historical, cultural, and political environments.

3.2 Targeted Population

The participants of the study were individuals that are directly related to the development of KMSS and its operations. These comprised school administration members, school alumni, teachers, parents and the Muslim community representatives. These groups were deemed necessary as they understood the historical development of the school, challenges that faced the school and how it has contributed towards the development of the Islamic based education in Kakamega County.

3.3 Sampling Techniques and Sample Size

The participants were identified through purposive sampling focusing on those who are knowledgeable and had hands-on experience with KMSS. The selection was made to guarantee that the interviewees would be able to offer credible information about the historical institution, input, and community influence of the school. School administrators, community leaders, long-serving teachers were key informants, and alumni and parents were used to give their views on the wider societal impact of the school.

3.4 Data Collection

Secondary and primary sources of information were used. Oral interviews and document analysis comprised the primary sources of data. The unstructured interview guides allowed the participants to explore themselves and to document the lived experiences of the people who were interested in the school. Secondary data consisted of archival records, school report, policy documents, and other literature. These sources were used in combination to provide triangulated information on the growth and role of KMSS.

3.5 Data Analysis

Thematic analysis was used to analyze the data collected. Oral interviews were transcribed, matched with archival documents, and coded into themes based on the study objectives. The six steps of thematic analysis process used by Braun and Clarke (2006) were used to identify recurrent patterns and come up with coherent stories. The method facilitated corroboration of oral testimonies with documentary data, and thus reliability and accuracy of the history in the contribution of KMSS.

IV. FINDINGS & DISCUSSION

4.1 The Historical Development of Kakamega Muslim Secondary School, 1983–2023

Islam reached Western Kenya between 1870 and 1885 through traders, gaining influence in towns such as Mumias and Kakamega, where Chief Nabongo Mumia embraced the faith with the support of Muslim allies (KNA: DC/KNG/2/8/13; O.I. Hesbon Omollo, 07/04/2025). As the Muslim population grew, the need for educational institutions rooted in Islamic values became more pressing.

Kakamega Muslim Secondary School (KMSS) was established in 1983 by the local Muslim community, with support from organizations like the Bilal Muslim Mission and the Muslim World League. Its creation responded to two key challenges: discrimination against Muslim learners in Christian-sponsored schools and the absence of nearby Islamic secondary schools. Previous Islamic institutions like the Mumias Muslim School (1946), the Maragoli Muslim School (1950), and the Gambogi Muslim School (1954) were well outside Kakamega town, restricting access by the locals (KNA: ED/25/7/1/16340). Such founders as Hamisi Maalim Gaziti and Mwanji Akida Jesh thought of KMSS as a school that would offer combined education, i.e. teaching secular courses along with Islamic Religious Education (Isaack, 2018). During its initial years, KMSS shared with Kakamega Muslim Primary School, although, with community mobilization and organizational assistance, KMSS established its own buildings, which consisted of classrooms, dormitories and mosque.

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Islamic organizations played a vital role in providing financial aid, such as funding building libraries e.g Bilal Muslim Mission and offering scholarships in 2022 under the support of local mosques. This teamwork has seen KMSS become a reputable institution that provides a holistic education based on academic excellence and Islamic values. Below is a table showing funding from Islamic organizations to the school.

Table 1

Funding from Islamic Organizations to the School

Year	Organization	Contribution	Purpose
2000	Bilal Muslim mission	Ksh 500,000	Construction of School library
2002	African Muslim Agency	Ksh 200,000	School latrine construction
2010	Muslim World League	Ksh 1,200,000	Classroom construction
2022	Local Mosques	Ksh 300,000	Student bursaries

4.2 Contribution of Islam to the Development of Kakamega Muslim Secondary School, 1983-2023

Islamic education is uniquely different from other types of educational theory and practice at large because of all the encompassing influence of the Quran. The Quran served as the comprehensive blueprint for both the individual and society and as a primary source of knowledge. Basic Islamic education took place in mosques and this type of education emerged in response to disseminating and deepening the leaners knowledge of Islamic faith (Adan, 2013).

The growth and development of Kakamega Muslim Secondary School was greatly influenced by the Islamic faith and denominational impacts. According to the September report of education 1997 the Kenya Muslim Charitable Society (KMCS) was one of the key instrumental organizations that was in support of educational initiatives across Kenya and all Muslim schools benefited under the organization including the Kakamega Muslim Secondary School. The main aim of the organization was to provide accessible education to all Muslim communities and their children at large thereby fostering both a religious and well integrated curriculum. This was also provided on the annual report on education of 1990 (KNA: EDU/3/4/7; O.I. Khadijah Abdul, 10/04/2025).

One of the beneficiaries of KMCS and is currently a teacher of Islamic Religious Education (IRE) and History at Ichinga Muslim Secondary School in Mumias added that secular and religious education was inseparable at the school and that the main aim of education was to enhance a total way of life in mankind as this words were commonly said by madam Amina Rajab. These words were so neutral to every student and madam Amina helped us to even understand the Islam as any other denomination in that it was not only based on Quranic teachings but also helping one to enhance their total way of life (O.I. Gladys Oduor, 10|04|2025; KNA: MOE /2/17602).

In addition to what Gladys pointed out, Khadijah said that Madam Amina Rahab was one of the best teacher and students loved her so much. She was a role model to most of the girls in the school because of her unique teaching tactics in Islamic Religious education which made the students to love her subject and even posted good results and her subject was always among the best. Every time she was in class students were happy and excited because it was not a boring class. She associated well with students and encouraged them also to emulate good morals and follow the teachings of Prophet Mohamad (O.I Khadija Abdul, 10|04|2025; KNA: MOE/2/17602).

Islamic Religious Education was offered as part of the curriculum that enriched students' spiritual understanding and giving Muslim Students a strong identity. The Quranic studies, Fiqh (Islamic jurisprudence) and Hadith studies were also incorporated to complement the national curriculum by reinforcing Islamic education alongside secular subjects (KNA: ED/1/3/9; O.I, Naomi Mbayi, 09/04/2025)

The school facilitated Islamic practice by having a mosque and prayer facilities holding regular jumu'ahh prayers and Scheduling school activities to align with prayer times and religious obligations. During Ramadhan, students were supported in fasting and special programs such as Tarweed prayers or Quranic competitions were organized (O.I. Gladys Oduor, 10/04/2025).

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Plate 1
This was the first Mosque that was used by students to do there evening prayers, on the left at the entrance is where they washed their feet before going **in the Mosque**

Source: School Records 23/10/2001

The school also emphasized on education for both genders and encouraged the inclusion of Muslim girls in schooling. The school provided a safe environment for Muslim girls to learn while observing Islamic dress codes (Buibui) and boys (kanzus), they were also allowed to participate in school life which helped at large in increase of the school's enrollment rates over time (O.I. Gladys Oduor, 10/04/2025; KNA: MOE /2/17610). Therefore, this study finding suggest a deeper connection between religious identity and educational advancement than previously acknowledged.

4.2.1 Islamic Educational Philosophy and Its Impact on Kakamega Muslim Secondary School

The philosophy of Islamic education looked at the principles and concepts that were underlying education and Islam, it analyzed and criticized, deconstructed and disintegrated the existing educational infrastructure and strived to produce new concepts continuously. The educational Islamic philosophy seek to the distinct role of human beings which is reform and construction of human life. This concept of life based on fundamental concepts as individuals, society and the world and education worked together to find a balanced relationship and equitable between the parties and to this equation which were based on a relationship characterized by a mutual and integration so one party cannot survive without the other (Ahmed, 2010).

The Islamic educational philosophy had a significant impact on the foundation, development and operational culture on many Islamic based schools. The Islamic Philosophy played a transformative role in shaping Kakamega Muslim Secondary School. This philosophy was rooted in the belief that knowledge was both a spiritual and an intellectual pursuit aiming at developing the whole person physically, morally and spiritually (KNA: ED/1/3/9). The philosophy fostered a value based learning environment where academic excellence was harmonized with spiritual growth by ultimately contributing to the holistic development of students and a broader Muslim community in Kakamega (KNA: ED/1/3/9; O.I. Abbas Sheikh 13/04/2025).

At the core of Islamic philosophy was (Taw heed) which meant oneness of God, and implied that all knowledge came from Allah and it was a must that it was to be used to serve him and humanity. At the school the principle was evident in both secular and religious knowledge and both were taught with equal importance. The integration of Islamic Religious Education (IRE) into the national curriculum ensured that students grew with an understanding that all knowledge was interconnected and purposeful (O.I. Hesbon Omollo, 10/04/2025). Bakar Mohamed added that the same Islamic philosophy viewed education as a means of Tarbiyya which meant nurturing individuals, spiritually, intellectually and physically, he said that it was a common virtue taught at the mosque by Mr. Sheikh Idris. The school also emphasized on discipline, moral conduct and character building and nurtured students who were not just academically competent but also socially responsible and morally upright. This was evident through programs like

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Quranic recitation, school wide prayers and community service learning (O.I Bakar Mohammad, 11/04/2025; KNA: ED/25/7/1/1/16340).

Adan (2013) highlighted that, during early years, the concept of Ilm as Ibadah (knowledge as worship) taught that acquiring knowledge was an act of devotion to Allah. At the school students were encouraged to seek education not just for employment but for spiritual fulfilment and service to the community. These enabled learners to foster a strong work ethic, motivation and a higher sense of purpose as well. It was evidently seen by students being committed for the Sunna prayers which were done in the evening at the mosque. Some of the activities that they engaged in to ensure that they kept the concept of Ilm as Ibadah was having time of reading and contemplating the Quran which was considered as the act as worship and seeking knowledge about Gods word, the studying of Islamic jurisprudence, theology ,history and other related fields enhanced an individual's understanding of faith and also teachings and sharing of knowledge with others was a form of worship as it contributed to the spread of knowledge and understanding (KNA: MOE /2/17; O.I. Swabrina Amina, 10/04/2025).

With reference to the Education Annual Report of 1985, the outcomes of this educational approach were clearly evident in the school's performance and conduct of many learners who are the alumni of the Kakamega Muslim Secondary School. Many of them are holding respectable positions in the society both in professional and religious spheres like Gladys Jumah who is a teacher of Ichinga Muslim Secondary school in Mumias and Abbas Abdul-Aziz who once served in the Ministry of Education in Kakamega County (O.I Hesbon Omollo 07|04|2025). Their success was often attributed to the balanced education they received that was grounded in faith and enriched with academic excellence. The school became a model of how Islamic principles were harmonized with education to provide capable conscientious citizens (O.I Bakar Mohamed, 11|04|2025; KNA: MOE/1/2/17).

4.2.2 Islamic Community Support on Kakamega Muslim Secondary School

According to Nobili (2020), Abdinur the Islamic community played a pivotal role in the development of infrastructure and resources at many Islamic integrated schools across the country including the Kakamega Muslim Secondary School. This was seconded by Dr. Amina Yusuf, a former student of the school that they received the support through the collective efforts and religious obligation that is members of the Islamic faith provided significant financial support that enabled them as a school to construct and renovate of essential school facilities. In addition, various Islamic organizations like the Bilal Muslim Mission which helped the school in construction of the school library the African Muslim Agency which helped the school in construction of school latrine and Muslim World League which helped the school in construction of classrooms. Furthermore, some contributions often came in form of Zakat (Obligatory alms) Sadaqah (voluntary charity) and Waqf (endowments). These were deeply rooted in Islamic teachings on community development and social responsibility (O.I. Dr. Amina Yusuf, 11/04/2025; KNA: MOE /2/17729).

Bakar Mohamed who was a classmate to Dr. Amina Yusuf added that, he also benefited from the Islamic donor agencies more specifically the Bilal Muslim Mission, which provided funds that were used in improving the school's infrastructure and also provided the learning materials like books, pens and portable chalk boards which at large helped them to have a good access with the learning materials as back they were not enough. He also added that the same organization assisted the school in building prayer center in honor of Allah which was used by the students especially during the evening prayers. The organization also provided the school with science equipment's. Their contribution not only enhanced the physical environment of the school but also enriched the learning experience (O.I. Bakar Mohammed, 11/04/2025; KNA: DC/KMG/2/8/5).

Mr. Musa Andako, who was one of the Board of Management members at the school in 2005, noted that the Islamic community contributed largely to the school, especially in terms of human resource development by supporting the recruitment of qualified teachers, offering poor students scholarships and offering training opportunities for its staff. The local Muslim leaders and scholars also engaged students with the mentorship programs, religious guidance and motivational talks which at large played a key role in shaping student character and academic discipline (O.I Mr. Musa Andako, 11/04/2025; KNA: DC/KMG/2/8/5).

To add on that, the school also benefited from strong partnership with local mosques and Islamic centers which helped to mobilize support for fundraising and promote volunteerism among community members. This close relationship between the school and surrounding Muslim community ensured continued support for the school growth thus leadingng to a sustained improvement in infrastructure and education resources. Ultimately, the support from the Islamic community not only contributed to the physical expansion of the Kakamega Muslim Secondary School but also strengthened its identity as a center of both academic excellence and spiritual development (O.I Mr. Hesbon Omollo, 11/04/2025; School records, 06/07/2007).

4.2.3 The Socio-Cultural Impact of Islam to Kakamega Muslim Secondary School

The socio-cultural impact of Islam on the Kakamega Muslim Secondary School was profound and far reaching in such a way that it was rooted in Islamic values and the school's foundation was greatly influenced by moral and ethical teachings of the religion (KNA: MOE 1/2/17729). The Islamic principles such as honesty, discipline, respect and

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modesty were installed in students' daily practices, religious instruction and strict adherence to the Islamic dress codes. The values shaped not only the character of students but also the overall environment of the school, fostering a culture of responsibility and sspiritual awareness. The development of Kakamega Muslim Secondary School was strongly supported by the local Muslim community and from its inception, members of the Muslim community in Kakamega came together and contributed land that was used by the school, financial resources and manpower. This communal effort demonstrated the Islamic spirit of Ummah (community) where by the collective responsibility and support for education were deeply valued. The school became a center of hope and pride for Muslims in the region over time by offering a safe and culturally appropriate learning space, particularly for the Muslim children who were often underserved in the mainstream institutions (O.I Abbas Sheikh 11|04|2025KNA: DC/KNG 2/8/13,).

Islam also played a crucial role in preservingg and promoting cultural identity within Kaka-mega Muslim Secondary School. The curriculum in-cooperated Islamic Religious Education (IRE) and Arabic which helped students connect with their religiouss and cultural roots. Celebrations of Islamic holiday such as Eid-al-fitr and Eidal-Adha along with observance of Ramadhan reinforced a sense of identity and belonging among students. These activities were not onlyy religious but also social occasions that brought together students, teachers and parents and broader community at large (O.I Abbas Sheikh, 11/04/2025).

Furthermore, the school contributed to the enhancement of social cohesion and mutual respect in the wider Kakamega region. The Islamic teachings of peace, justice and charity encouraged students to engage in acts of community service and interfaith dialogue. The school participated at large in joint community initiatives with other schools and religious institutions, promoting tolerance and peaceful co-existence. This helped to bridge the gap between Muslims and non-Muslims in the region hence fostering unity in a diverse society (KNA: DC/KMG/2/8/48).

The influence of Islam extended to the governance and management of the Kakamega Muslim Secondary School where by, the Islamic leaders were actively involved in the school's Board of Management, ensuring that decisions made were clearly aligned with religious values. Policies related to student behavior were also shaped by the Islamic principles. Through these significant contributions, they at large influenced by both the structure and spirit of the Kakamega Muslim Secondary School, enabling it to grow into a reputable institution that not only provided academic knowledge but also nurtured moral and cultural development of the learners (O.I Bakar Mohammed, 12/04/2025).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The results have revealed that KMSS has been central in the provision of integrated education since its foundation in 1983 that incorporates both secular education and Islamic values. The evolution of the school was not a mere coincidence but a result of community mobilization, the long-term contributions of Islamic organizations, and the willingness of local leaders to break down the historical marginalization of the school within the mainstream Christian-funded organizations. KMSS has expanded to be a well-known secondary school with its own facilities, discipline reputation, and have produced graduates who have made a significant impact in the fields of education, business, healthcare and religious leadership over the last forty years. The history of the school is used to show how Islamic education when incorporated into the national systems can also add value to the other parts of the educational system through its ability to foster moral discipline, excellence in academics and solidarity of the community. As the example of KMSS reveals, Islamic education in Kenya cannot be regarded as peripheral, but as an essential ally in the national development. The school has demonstrated that it is possible to produce holistic learners who are both academically competent and ethically based with the integration of faith and modern curricula.

5.2 Recommendations

It is on the basis of these findings that this research proposes that the Ministry of Education, the Muslim community and the school administration should liaise more to maintain and ensure the distinctive work of KMSS. First, the Ministry must consider and give support to faith-based institutions like KMSS not only with inclusion in the policy but also with fair distribution of resources to enhance infrastructure and teacher training. More so, the school administration ought to maintain their Islamic background but keep pace with the reforms of the national curriculum so that learners can be provided with both academic and moral education. Moreover, the Muslim community must also be actively involved to offer financial and moral assistance, enhance alumni organizations, and maintain collaboration with the international Islamic organizations in an effort to increase scholarships and infrastructural investments. Lastly, promoting partnership between KMSS and other education stakeholders may facilitate knowledge exchange and make faith-based schools play a more visible role in achieving the educational objectives in Kenya.

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REFERENCES

Adan, S. S. (2013). *Islamic education in Kenya: A case study of Islamic integrated schools in Garissa County* (Doctoral dissertation, University of Nairobi).

Ahmed, J. U. (2010). Documentary research method: New dimensions. *Indus Journal of Management & Social Sciences, 4*(1), 1–14.

Anderson, D. M. (2005). *Histories of the hanged: The dirty war in Kenya and the end of empire*. Weidenfeld & Nicolson.

Bakari, M., & Yahya-Othman, S. (1997). [Referenced in thesis as part of Islamic educational institutional development].

Bogonko, S. N. (1992). *A history of modern education in Kenya (1895–1991)*. Evans Brothers.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101.

Brown, J. (2013). Scripture in the modern Muslim world: The Qur'an and Hadith. In *Islam in the modern world* (pp. 13–33). Routledge.

Creswell, J. (2018). *Research design: Qualitative, quantitative and mixed methods approaches* (4th ed.). Sage Publications.

Gale, T. (2001). Critical policy sociology: Historiography, archaeology and genealogy as methods of policy analysis. *Journal of Education Policy, 16*(5), 379–393.

Hall, B. S. (2011). *A history of race in Muslim West Africa, 1600–1960*. Cambridge University Press.

Inyega, J. O., Arshad-Ayaz, A., Naseem, M. A., Mahaya, E. W., & Elsayed, D. (2021). Post-independence basic education in Kenya: An historical analysis of curriculum reforms. *FIRE: Forum for International Research in Education, 7*(1), 1–23.

Isaack, M. A. (2018). Islamic education in Kenya from colonial period to date. *International Academic Journal of Social Sciences and Education, 2*(1), 1–11.

Kane, O. O. (2016). *Beyond Timbuktu: An intellectual history of Muslim West Africa*. Harvard University Press.

Lelei, M. C., & Weidman, J. C. (2012). Education development in Kenya: Enhancing access and quality. In *Quality and qualities* (pp. 143–162). Brill.

Mackatiani, C., Imbovah, M., Imbova, N., & Gakungai, D. K. (2016). Development of education in Kenya: Influence of the political factor beyond 2015 MDGs. *Journal of Education and Practice, 7*(11), 55–60.

Maidugu, U. A., & Sadeeq, A. A. A. (2024). Islam and morality: The teachings of Al-Ihsan from the Qur'an and Hadith and its effects on Muslim Ummah. *Solo Universal Journal of Islamic Education and Multiculturalism, 2*(03), 181–194.

Mashic, A. (2009). Culture, indigenous knowledge systems and sustainable development: A critical view of education in an African context. *International Journal of Educational Development, 29*(2), 140–148.

Mazrui, A. A. (Ed.). (2014). *African thought in comparative perspective*. Cambridge Scholars Publishing.

Møller, B. (2006). Political Islam in Kenya (No. 2006:22). *DIIS Working Paper*.

Mulaa, J. (1981). The politics of a changing society: Mumias. *Review of African Political Economy, 8*(20), 89–107.

Muricho, W. P., & Chang'ach, J. K. (2013). Education reforms in Kenya for innovation. *International Journal of Humanities and Social Science, 3*(9), 123–144.

Nasimiyu, R. (2000). Islam in Western Kenya: The role of Islamic institutions in educational development. *Journal of Muslim Minority Affairs, 20*(1), 99–133.

Nobili, M. (2020). Reinterpreting the role of Muslims in the West African Middle Ages. *The Journal of African History, 61*(3), 327–340.

Ocitti, J. P. (1966). Kitgum: An urban study. *East African Geographical Review, 1966*(4), 37–48.

Oded, A. (2000). *Islam and politics in Kenya*. Lynn Rienner Publishers.

Osogo, J. (1966). *A history of the Baluyia*. Nairobi.

Otiende, J. E., & Sifuna, D. N. (1994). *An introductory history of education*. Nairobi University Press.

Porter, A. (2004). *Religion versus empire?: British Protestant missionaries and overseas expansion, 1700–1914*. Manchester University Press.

Reese, S. S. (2014). Islam in Africa/Africans and Islam. *The Journal of African History, 55*(1), 17–26.

Republic of Kenya. (1964). *Ominde Report*. Government Printer.

Republic of Kenya. (1986). *Sessional Paper No. 1 on Education and Manpower Training for the Next Decade and Beyond*. Government Printer.

Sanneh, L. (2015). *Piety and power: Muslims and Christians in West Africa*. Wipf and Stock Publishers.

Sheffield, J. R. (1973). *Education in Kenya: An historical study*. Teachers College Press.

Sifuna, D. N. (1990). *Development of education in Africa: The Kenyan experience*. Initiatives Ltd.

Tracy, S. J. (2019). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact* (2nd ed.). Wiley Blackwell.

Licensed Under Creative Commons Attribution (CC BY-NC)

Wanjohi, A. M. (2011). Development of education system in Kenya since independence. *KENPRO Online Papers Portal, 5*, 1–10.

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Strategies for reducing outpatient waiting times in urban public hospitals in Lusaka, Zambia: A Cross-Sectional Study

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ABSTRACT

Delays in outpatient waiting times are one of the major barriers to health system performance and patient satisfaction in the low- and middle-income countries. In Lusaka, Zambia, there is still endemic congestion and inefficiencies within the functioning of the first-level hospitals in the country. In order to research these phenomena, a cross-sectional study was conducted at Kanyama and Chilenje First-Level Hospitals, where 410 adult outpatients were selected through the simple random sampling method. Queuing theory guided the study. These quantitative findings are just a portion of a large mixed study that aimed at developing an operational framework for optimizing outpatient waiting time in public health facilities in Zambia. A designed questionnaire was used to gather the information on demographics, service-point waiting time, patient perceptions, and factors with regard to management. Descriptive and inferential statistical analyses were implemented in SPSS v26 and responses given in open-ended format to thematic coding, respectively. Almost half (46.13%) of the respondents have waited between 3 and 6 hours, with the longest waiting time at the reception, triage, and pharmacy. The shortage in human resources, especially when the restaurant is facing peak times, as well as insufficient infrastructure, has turned out to be the effective predictor of long waiting times. Even though 82 percent of the facilities stated the use of an appointment system, most visits (72 percent) were walk-ins, meaning little use of scheduling tools. The measures that were confidently supported by patients included additional staffing during the busy hours, the task-shifting towards nurses in case of routine consultations (90.7%), and the introduction of the triage and appointment systems (more than 80). A willingness to repeat the same facilities was mentioned by only 31% of patients, and their reasons were long queues, bad coordination, and slow service delivery. Generally, the systemic inefficiencies, low capacity of the staff, and lack of infrastructure are the major causes of outpatient delays in the public hospitals of Lusaka. To effectively reduce outpatient waiting times, strategic efforts should prioritize workforce optimization, improvement of triage and appointment mechanisms, digitalization of patient registration through SmartCare, and expansion of healthcare infrastructure. Embedding these initiatives within Zambia's broader health systems management and e-health frameworks is likely to yield substantial improvements in service delivery efficiency, patient satisfaction, and overall trust in the public health system.

Keywords: Lusaka, Outpatient Waiting Time, Patient Satisfaction, Strategies, Triage, Zambia

1. INTRODUCTION

Healthcare outpatient waiting time is one of the indicators of efficiency and responsiveness in the health system that are most commonly cited. This measure focuses on the total period of time that a patient spends before care can be administered to him or her, taking in to consideration the time spent at the triage, during the consultation, laboratory and pharmacy times among other facilities. According to the World Health Organization, long waiting times adversely affect the quality of care and delay diagnosis and treatment in addition to the patient satisfaction (Redhead, 2021).

Prolonged wait times have been an endemic problem in Zambia, especially in first-level hospitals in Lusaka where most of the population-over 3.3 million, an urbanization rate of 4.15percent per year (Ministry of Health, 2021) depends on the state health service. Routine patient outpatient traffic in the hospital is an average of 500-1000 patients in a day, which leads to a phenomenon of crowding the reception areas, waiting bays and wonted waiting lines in consultation and pharmacy zones (Zafar et al., 2024). Even after such interventions as triage systems, extra staffing, and appointment scheduling, the patients in Lusaka tend to spend three to six hours in the outpatient departments.

The majority of outpatient service delivery delays are systemic and infrastructure-related, indicating ingrained inefficiencies in medical institutions. Staff shortages, insufficient consultation spaces, and ineffective registration processes all contribute to congestion in clinics and hospitals and impede efficient patient flow (Musey et al., 2021). Longer wait times are caused by a shortage of healthcare personnel compared to the number of patients, and bottlenecks

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caused by a lack of consultation rooms force patients to wait a lengthy time before obtaining care. These structural limitations exacerbate the inefficiency of healthcare operations by slowing service delivery and putting more burden on current employees (Ministry of Health, 2021).

In addition to infrastructure difficulties, poor registration processes play a crucial role in outpatient delays. Many institutions still use manual record-keeping or obsolete administrative systems, which are prone to mistakes and delay overall operations. Patients frequently face repeated verification processes, missing documents, or extended processing times, which adds to their irritation and worry(Aeenparast et al., 2019). The dependence on these inefficient approaches impedes timely access to treatments and leads to a sense of disorganisation within the healthcare system. Such procedural delays highlight the importance of efficient, automated registration solutions that may eliminate redundancies and increase patient throughput (Musey et al., 2021).

These systemic and procedural factors collectively result in patient dissatisfaction and reduced quality of care. Patients frequently report intolerable wait times, with overcrowding, poor coordination among departments, and slow service delivery identified as primary sources of frustration (Zafar et al., 2024). The cumulative effect of these challenges is a healthcare environment where access is delayed, patient expectations are unmet, and overall service quality is compromised. Addressing these issues requires comprehensive interventions targeting both infrastructural improvements and process optimization to enhance efficiency, patient experience, and satisfaction within outpatient services(Mostafa et al., 2020).

This study concentrated on tracking outpatient waiting times objectively and figuring out the infrastructure and systemic causes of these delays. This involved gathering numerical data on staff availability, patient flow, and service point congestion in addition to examining delay trends in various departments. These results are part of a broader mixed-methods study that also includes qualitative evaluations of patient experiences and views. The quantitative results offer evidence-based insights that can direct hospital administrators, legislators, and healthcare providers in implementing focused interventions to decrease delays and enhance operational efficiency by separating the quantifiable components of waiting times and service inefficiencies**.**

1.1 Statement of the Problem

The long outpatient waiting lines have been a chronic challenge to quality healthcare delivery in most of the low- and middle-income countries (LMICs). The most studies on waiting time have reported that, excess waiting times impair service efficiency, encourage patients to be unhappy with the service, and prevent timely healthcare-seeking habits. Research in sub-Saharan Africa such as Ghana, Nigeria, and Kenya indicate that more than three out of five patients are dissatisfied with waiting longer than two hours before being served (Villegas et al., 2021)

The problem of chronic overcrowding is observed in urban public hospitals in Zambia (in the metropolis of Lusaka), where the number of outpatients reaches 500-1,000 patients per day (Ministry of Health, 2021). Amid several attempts to reform the system (which include triage systems and digital record initiatives like SmartCare), there are still three to six-hour wait times in the first-level hospital (Hamoonga et al., 2024). A study done by Sialubanje et al. (2023) stated that, uunderstaffing, insufficient consultation space, manual registration, and absence of organization system in making appointments continue to pressure service delivery.

Although the world has suggested several possible operational and policy remedies such as appointment scheduling, task-shifting, and queue-management systems (MacLean et al., 2025), the adaptation of these within the system of the Zambian State has not been incorporated into a whole. However, empirical data at a patient level on the best management strategies to be used in enhancing responsiveness in service delivery are inadequate. This gap indicates necessity of evaluating the patient and system approach management to patient perceptions, in order to maximize the waiting time at outpatient services in the urban public hospitals in Lusaka.

1.2 Research Objective

To assess the health systems management practices to minimize outpatient waiting times in urban Lusaka public hospitals on the perspective of patients.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Queuing Theory

A mathematical framework called queuing theory is used to examine waiting lines and service systems, concentrating on factors including arrival rates, service rates, and the quantity of service channels (Biya *et al*, 2022). It clarifies how staff availability, patient flow, and service capacity interact to cause delays in the context of outpatient services. Healthcare administrators may anticipate bottlenecks, maximise staffing, and shorten patient wait times by utilising queueing theory. This theory has been used in studies on outpatient waiting times to model patient arrivals and

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service procedures. The results show that uneven patient arrivals and inefficient resource allocation are significant causes of extended waiting, which serves as a foundation for interventions to expedite service delivery.

2.2 Empirical Review

Waiting time refers to the amount of time during which a person has been staying in a medical institution before being seen or receiving care (Shokouhifar & Ranjbarimesan, 2022). It is normally subdivided into the following: registration, triage, consultation, laboratory, pharmacy and discharge. Researchers distinguish waiting time that can be objectively measured and waiting time that is perceived, the latter being closely linked to the satisfaction of the patients (Kalwar et al., 2021). Perceived wait time can at other times have more impact on dissatisfaction as compared to objective delays because psychological factors like uncertainty, anxiety and communication deficit will lead to dissatisfaction (Biya et al., 2022).

Patient satisfaction is a complex phenomenon that includes accessibility, timeniness, interpersonal relationships, and perception of quality (Almeida et al., 2021). The fact that the relationship between extended waiting periods and satisfaction is negative has been widely demonstrated (Bolton Moore et al., 2020; Biya et al., 2022). On the same note, in Nigeria observed that the wait time was among the most important predictors of the low outpatient care ratings(Burgoyne et al., 2020).

In high-income institutions where the waits are long, the waits are not satisfactory but the average wait is also shorter (15.45 min). Ukonu *et al.* (2024) have proven that even small shifts in patient waiting time in the United States were correlated with negative change in patient satisfaction Population. These results demonstrate that waiting time has a prevalent influence on the perception of the quality of healthcare, and the effect is even stronger in the circumstances when resources are limited. How individuals establish their health needs, how they assess the available care options and how they determine whether to seek care or not is the health-seeking behavior (Sialubanje et al., 2023). Based on the Andersen Behavioral Model, the factors that determine the utilization of healthcare include predisposing factors, enabling factors, and need factors. Waiting time is one of the enabling, systems level factors that have a direct impact on patient decisions on using or not using services.

The findings of empirical studies in sub-Saharan Africa confirm that waiting time is a deterrent to timely care-seeking behavior and patients resort to finding alternative services to replace this behavior. Moshabela et al. have shown that patients in South Africa are inclined to drop the trip to the existing facilities preferring to resort to pharmacies and traditional healers in case of the long delays. Similarly, in Zambia, Sialubanje et al. (2023) have determined that potentially too long waiting times in the facility stimulated women to prefer traditional birth attendants to formal ones. Such results testify to the fact that waiting times are not only a cost of satisfaction but also a factor of healthcare consumption.

Prolonged waiting times are systemic due to the lack of workforce, especially in low- and middle-income countries and the unoptimization of patient-flow, poor triage, and lack of a referral system (Oladele et al., 2020). Furthermore, the lack of outpatient appointment scheduling, as well as the electronic medical records, is another technological constraint and one of the causes of congestion of outpatient divisions (Biya et al., 2022).

Comparative studies also focus on the effectiveness of operational innovations; introduction of appointment systems and electronic queue management in Uganda and Tanzania significantly shortened the waiting time (Beck *et al*, 2021). These interventions show that even small modifications to the system can result in a great efficiency boost in the resource-limited environment.

The outpatient department waiting time in the Zambian health facilities is indicative of chronic overcrowding especially in the urban areas. Lusaka reported the waiting time of 2-6 hours in outpatients, which is significantly higher than the global indices (MacLean et al., 2025).Sialubanje *et al*. (2023) focused on the shortcomings in the referrals system that had overburdened the tertiary hospitals with cases that could be handled at the primary hospitals. Bottlenecks in triage and consultation were established by Musey *et al* (2021) to be the causes of delays in tertiary hospitals. Waiting time issues have been mentioned numerous times in performance reviews published annually by the Ministry of Health (2021) as elements that cause patient dissatisfaction and loss (Ministry of Health, 2021).

However, these studies as well as exquisitely define the extent of the issue, not many of them directly corroborate waiting time with patient satisfaction and subsequent health-care use in Zambia. This is a testimony to the necessity of empirical research, including the current study, in order to distinguish the direct influence of waiting time factor on the satisfaction levels and utilization rates in the first-level hospitals in Lusaka.

III. METHODOLOGY

3.1 Research Design

The research design was a cross-sectional study design with a qualitative. This method allowed the measurement of outpatient waiting time in the first-level hospitals, the systemic, infrastructural, and staffing-related variables, and the perception of the patients waiting time and also establish predictors through the use of regression analysis.

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3.2 Research Setting

The study was carried out at Kanyama First-Level Hospital and Chilenje First-Level Hospital in Lusaka District, Zambia; high-volume public health facilities with high density in terms of their catchment and routinely faced overcrowding of outpatient departments (OPDs). They were intentionally chosen as sites of the first level hospital activities with large patient volumes.

3.3 Population and Eligibility Criteria.

The population of interest was adult outpatients aged 18 years and above who were in the selected hospitals during the period of conducting the research. The members had to be a person who was eligible to receive service, including consultations, follow ups, referrals, laboratory tests or pharmacy refills. All the consenting adults (dispersing 18 years), who attended OPDs in the data-collection period, were eligible and were later recruited into the study. Those who only provided the emergency services, patient with severe conditions, who could not communicate, and minor children without a legal guardian were excluded.

3.4 Sample Size and Sampling Procedure.

The sample size of 422 outpatients was estimated to have followed standard formulas of cross-sectional surveys and a 95% confidence level and 5 margin of error. This calculation was done to have enough power to represent variability in waiting times and possible non-response. The true population of the sample was 384, and 410 questionnaires were filled and considered valid enough to analyze them, which presented a 97.2 percent response rate. Derivation of the sample size is illustrated as below.

$n=(z)^2p(1)\ d^2$

Where:

n = sample size

z = Z score at a confidence level of 95% (equal to 1.96)

p = estimated proportion of the population with the characteristic of interest (assumed to be 0.5 for maximum variability, as the true proportion was unknown)

d = margin of error (set at ±5%) Substituting the values into the formula: $n = (1.96)^2 \times 0.5 \times (1-0.5) / (0.05)^2$

n = 384.16

10% was calculated as provision for non-response.

Which ultimately came to 422

A stratified sampling approach was employed to enhance representativeness and minimize bias.

3.5 Data Collection Tool

The collection of data was done with the use of a structured, pre-tested questionnaire. This instrument consisted of three parts. The questionnaire was piloted in an establishment of a similar size so as to make it clear, reliable and content valid.

3.6 Data Collection Procedure

The questionnaires were administered by trained research assistants using face-to-face interviews after getting the informed consent. The data collection was done in outpatient waiting departments.

3.7 Data Analysis

All data were entered, cleaned and SPSS version 26 was used to analyse. The demographic data, waiting periods, and perception were summarised by descriptive statistics. Various tables presented the means, medians, frequencies and percentages based on the nature of the variable. The inferential statistics were used to test the relationships among waiting times and independent variables.

3.8 Ethical Considerations

The research was ethically approved by the Biomedical Research Ethics Committee of the University of Zambia (UNZABREC). The analytics clearance was obtained with the Lusaka District Health Office and the management of the sampled hospitals. Each participant gave an informed consent in written form. The privacy of information was also maintained by avoiding the gathering of personally identifying information and secure storage of all information. Participation was voluntary and the respondents were made aware that they could withdraw themselves at the will of the study without any penalty.

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IV. FINDINGS & DISCUSSION

4.1 Findings

This section describes the socio-demographic characteristics of the respondents to the research. Understanding these features is critical because they add context to the findings and help explain differences in reactions and outcomes. Age, gender, marital status, education level, employment, and other demographic parameters were examined. These characteristics are critical for evaluating the study's findings because they may impact perceptions, experiences, and behaviours regarding outpatient waiting times in public health facilities.

Table 1

Socio-Demographic Characteristics of Respondents (N = 410)

Variables	Category	Frequency	Percent
Age	Below 18 Years	79	19.3
	18–25 Years	104	25.4
	26–35 Years	140	34.1
	36–45 Years	40	9.8
	46–55 Years	36	8.8
	Above 66 Years	11	2.7
	Total	**410**	**100.0**
Marital Status	Married	159	38.8
	Single	179	43.7
	Divorced	26	6.3
	Separated	46	11.2
	Total	**410**	**100.0**
Education Level	Secondary Education	194	47.3
	No Education	15	3.7
	Postgraduate Education	37	9.0
	Tertiary Education (College/University)	143	34.9
	Primary Education	21	5.1
	Total	**410**	**100.0**
Employment Status	Unemployed	96	23.4
	Self-employed (Informal)	149	36.3
	Employed (Formal)	129	31.5
	Student	25	6.1
	Retired	11	2.7
	Total	**410**	**100.0**

Table 1. Most of the respondents were women (62.4%), and the average age was of around 34 years. The study also revealed that, almost half (47.3) were educated to secondary level and 29.5% were educated to primary level and 23.2% to tertiary level. Majority participants were married (58.0%). In terms of education level, over half (47.3%) had completed secondary school, 34.9% had completed higher education (college or university), 9.0% had postgraduate credentials, 5.1% had completed elementary school, and 3.7% had no formal education. In terms of job status, the majority, 36.3% were self-employed in the informal sector.

4.2 Services Point Waiting Time

This study assessed the average waiting time at various service points within the selected facilities. Table 2 provides a summary of the mean waiting times observed at each service point.

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Table 2
Service Point Waiting Time

Service Stage	Time Category	Frequency	Percentage (%)
Triage Waiting Time	Less than 30 minutes	75	18.3%
	30 minutes–1 hour	239	58.3%
	1–2 hours	78	19.0%
	More than 2 hours	18	4.4%
	Total	**410**	**100.0%**
Reception Turnaround Time	Less than 10 minutes	61	14.9%
	10–30 minutes	191	46.6%
	31–60 minutes	139	33.9%
	More than 60 minutes	19	4.6%
	Total	**410**	**100.0%**
Consultation Waiting Time	Less than 5 minutes	33	8.0%
	5–10 minutes	110	26.8%
	10–15 minutes	172	42.0%
	More than 15 minutes	95	23.2%
	Total	**410**	**100.0%**
Laboratory Turnaround Time	Not Applicable	177	43.2%
	Less than 30 minutes	61	14.9%
	30 minutes–1 hour	93	22.7%
	1–2 hours	52	12.7%
	More than 2 hours	27	6.6%
	Total	**410**	**100.0%**
Pharmacy Turnaround Time	Not Applicable	50	12.2%
	Less than 10 minutes	65	15.9%
	10–30 minutes	190	46.3%
	30–60 minutes	100	24.4%
	More than 60 minutes	55	13.4%
	Total	**410**	**100.0%**
Other Services (Estimated)	Not Applicable	70	17.1%
	Less than 15 minutes	120	29.3%
	15–30 minutes	170	41.5%
	More than 30 minutes	50	12.2%
	Total	**410**	**100.0%**

For triage waiting time, the majority of patients (239, or 58.3%) waited between 30 minutes to 1 hour, followed by 78 patients (19.0%) who waited 1 to 2 hours. A smaller proportion 75 patients (18.3%)—waited for less than 30 minutes, while 18 patients (4.4%) reported waiting more than 2 hours. These figures suggest moderate performance in triage, though delays remain for a significant subset. Regarding reception turnaround time, 191 patients (46.6%) were processed within 10–30 minutes, and 61 (14.9%) were attended to in less than 10 minutes. However, 139 patients (33.9%) experienced waits of 31–60 minutes, while 19 (4.6%) reported delays of more than an hour, indicating room for efficiency improvement at the initial contact point.

Consultation waiting time data shows that 172 patients (42.0%) waited 10–15 minutes, and 110 (26.8%) were attended to within 5–10 minutes. Only 33 (8.0%) were seen in less than 5 minutes, whereas 95 patients (23.2%) endured waits of more than 15 minutes, showing that a quarter of patients still faced extended delays before consultation. The laboratory turnaround time indicates significant variability. While 93 patients (22.7%) received results within 30 minutes to 1 hour, and 61 (14.9%) in less than 30 minutes, 52 (12.7%) waited 1–2 hours, and 27 (6.6%) had delays beyond 2 hours. Notably, 177 patients (43.2%) did not require laboratory services, reflecting the clinical variation in outpatient visits.

4.3 Appointment Booking System, Type of Visit Schedule and Pre-Book Method

In order to maximise patient flow and shorten wait times in medical facilities, effective outpatient appointment management is essential. It is cardinal to state that, how well patients are attended to upon arrival is determined by the pre-book technique, the kind of visit schedule, and the appointment booking system. These elements serve as the foundation for the provision of healthcare services, impacting not just overall service quality and patient happiness but

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also operational efficiency. This section presents appointment Booking System, Type of Visit Schedule and Pre-Book Method.

Table 3

Appointment Booking System, Type of Visit Schedule and Pre-book Method

Variable	Response Category	Frequency	Percent (%)	Cumulative Percent (%)
Appointment Booking System	Yes	337	82.2	82.2
	No	73	17.8	100.0
	Total	**410**	**100.0**	—
Type of Visit Schedule	Walk-in	296	72.2	72.2
	Pre-booked	56	13.7	85.9
	Referral	58	14.1	100.0
	Total	**410**	**100.0**	—
Pre-book Method	Not Applicable	304	74.1	74.1
	In Person	106	25.9	100.0
	Total	**410**	**100.0**	—

Among the 410 responses, 337 (82.2%) replied that facilities have have an appointment booking system with 73 (17.8%) being in a position to say otherwise. In relation to the kind of visit schedule, 296 participants (72.2%) said that they were walk-ins without prior scheduling, 56 (13.7%) had scheduled their appointments before, and 58 (14.1%) were referred to their facility. In the method of pre-booking, there were 304 respondents (74.1%) who said that this does not apply to them and 106 (25.9%) have booked their visit personally.

4.4 Strategies to Reduce Outpatient Waiting Time

This section includes strategies recommended by patients to reduce outpatient wait times. It focuses on identifying both institutional and operational measures that can improve service efficiency, streamline patient flow, and optimize resource utilization within the hospitals. The goal is to find institutional and operational measures that help enhance service efficiency and patient flow management.

Table 4

Strategies to Reduce Outpatient Waiting Time

Strategy	Yes (n, %)	No (n, %)
Appointment booking system (online or in-person)	337 (82.2%)	73 (17.8%)
Triage system to prioritize urgent cases	348 (84.9%)	62 (15.1%)
Additional staff during peak hours	392 (95.6%)	18 (4.4%)
Task-shifting (e.g., nurses handling routine consultations)	372 (90.7%)	38 (9.3%)
Separate fast-track lanes for minor ailments	338 (82.4%)	72 (17.6%)
Health education/entertainment while waiting	288 (70.2%)	122 (29.8%)
Digital queue management or token system	100 (24.4%)	310 (75.6%)
SMS alerts for appointment reminders	280 (68.3%)	130 (31.7%)
Feedback mechanism for reporting delays	81 (19.8%)	329 (80.2%)
Close supervision of healthcare providers	92 (22.4%)	318 (77.6%)

The study indicated that the majority of respondents strongly support human-resource-related interventions. Specifically, 95.6% (n = 392) of participants emphasized the need for additional staff during peak hours, while 90.7% (n,372) stated that task-shifting strategies such as nurses managing routine consultations to ease clinician workload. On the other hand, patient sited SMS alerts for appointment reminders as one of the key strategies, this is evident by 68.3% (n = 280) response rate, while only 24.4% (n = 100) advocated for digital queue management systems, indicating lower acceptance of advanced technology solutions.

4.5 Statistical comparison of Outpatient Waiting Time by type of visit scheduled Categories

This section provides a statistical comparison of outpatient waiting times for various appointment schedules, including walk-in, pre-booked, and referral. The purpose of this investigation was to see if the kind of visit scheduling had a substantial impact on how long patients waited before obtaining medical treatment. To do this, the data were first examined for normality and variance homogeneity before using the relevant statistical tests. Because the data did not

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follow the assumptions of normal distribution and equal variances, a non-parametric Kruskal-Wallis test was employed to compare median waiting times among groups. Pairwise comparisons were then conducted to see if individual groups varied substantially from one another.

Table 5

Test of Normality and Homogeneity of Variance: Outpatient Waiting Time by Type of Schedule Visit

Type of Visit Schedule		Kolmogorov-Smirnov[a]			Shapiro-Wilk			Levene's test
		Statistic	df	Sig.	Statistic	df	Sig.	Sig: 0.05
Outpatient Waiting Time	Walk-in	0.277	296	0.000	0.787	296	0.000	
	Pre-booked	0.504	56	0.000	0.425	56	0.000	
	Referral	0.263	58	0.000	0.774	58	0.000	

Table 5 shows the findings of the Kolmogorov-Smirnov, Shapiro-Wilk, and Levene tests were used to determine the normality and homogeneity of variance in outpatient waiting time data across the three visit schedule types. The Kolmogorov-Smirnov and Shapiro-Wilk tests showed significant findings ($p < 0.05$) for all groups (walk-in, pre-booked, and referral), showing that the distribution of waiting times departed considerably from normality. The Levene's test for variance equality was significant ($p < 0.05$), indicating a violation of the assumption of variance homogeneity. These findings supported the use of a non-parametric statistical test (Kruskal-Wallis) to compare median waiting times between groups, rather than parametric approaches like ANOVA.

Table 6

Independent-Samples Kruskal-Wallis Test: Outpatient Waiting Time by Type of Visit Schedule

Total Number	410
Test Statistic	46.438[a]
Degree of Freedom	2
Asymptotic Sig. (2-sided test)	0.000

Table 6 summarises the findings of the Kruskal-Wallis test, which was used to establish if there were statistically significant differences in outpatient wait times across the three scheduling options. The test consisted of 410 observations with 2 degrees of freedom. The Kruskal-Wallis test ($\chi^2 = 46.438$, $p = 0.000$) revealed a significant difference in median waiting time across the groups. This implies that the kind of visit scheduling (walk-in, pre-booked, or referral) had a measurable impact on how long patients waited for care.

Table 7

Pairwise Comparisons of Type of Visit Schedule

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
Pre-booked-Referral	-66.036	20.624	-3.202	.001	.004
Pre-booked-Walk-in	106.590	16.042	6.645	.000	.000
Referral-Walk-in	40.554	15.807	2.566	.010	.031

In relation to Table 7 above, each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level of 0.05. Significance values were adjusted by the Bonferroni correction for multiple tests. To examine whether outpatient waiting time differs based on the type of visit schedule Walk-in, Pre-booked, or Referral tests for normality and homogeneity of variances were conducted. Both the Kolmogorov–Smirnov and Shapiro–Wilk tests yielded statistically significant p-values ($p = 0.000$) across all three groups, indicating that outpatient waiting time is not normally distributed for any category of visit type.

The Kruskal–Wallis test, a non-parametric alternative to ANOVA, revealed a statistically significant difference in outpatient waiting time across the three visit schedule categories ($\chi^2 = 46.44$, $df = 2$, $p < .001$). This implies that the type of appointment whether walk-in, pre-booked, or referral is significantly associated with variations in waiting time.

4.6 Regression Analysis of Staff Availability across Service Points as Predictors of Outpatient Waiting Time

This section summarises the findings of a regression study undertaken to assess the predicted link between staff availability across various service points and outpatient waiting times in the selected public health institutions. The study sought to determine if variations in the quantity and distribution of healthcare personnel such as receptionists, triage nurses, clinical officers, laboratory technicians, and pharmacy personnel have a substantial impact on the overall waiting time experienced by patients. By evaluating these relationships, the study hoped to quantify the influence of personnel sufficiency and deployment efficiency on patient flow and service delivery results. The findings provide

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empirical data to support staffing optimisation techniques and educate health-care management decisions targeted at lowering wait times and increasing patient satisfaction in outpatient departments.

Table 8

Regression Analysis of Staff Availability across Service Points as Predictors of Outpatient Waiting Time

Model		Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.	Tolerance	VIF
1	(Constant)	1.619	0.324		4.991	0.000		
	Nursing/Clinical Station	0.100	0.131	0.041	0.763	0.446	0.869	1.151
	Doctor's Room	-0.048	0.112	-0.025	-0.427	0.669	0.728	1.374
	Pharmacy	0.040	0.109	0.020	0.363	0.717	0.818	1.223
	Laboratory	0.140	0.086	0.088	1.635	0.103	0.839	1.192

The independent variables included the staff availability at the nursing/clinical station and doctor room, pharmacy and laboratory. An intercept value of 1.619 ($p < 0.000$) was obtained using the model, which depicts the anticipated waiting time of outpatients, when there is no staff availability at all the service points or when the staff availability is zero at all points.

None of the predictor variables was statistically significant at the 0.05 level. The staff availability of the nursing/clinical station was found to have a small, positive yet non-significant correlation with the waiting time (B = 0.100, p =0.446) and this implies that the waiting time is slightly increased in the presence of staff at the nursing/clinical station. Equally, there was a minor positive relationship and no statistical significance between staff availability in the pharmacy (B = 0.040, p = 0.717) and laboratory (B = 0.140, p = 0.103) and waiting time. However, the staff availability in the doctor's room reported a small negative correlation (B -0.048, p= 0.669) which suggests that waiting time may decrease when the doctor is available, yet there was no statistical significance in this relationship as well.

The diagnostics of multicollinearity revealed that there was no multicollinearity since all of the Variance Inflation Factor (VIF) were between 1.151 and 1.374 with the tolerance values being significantly larger than 0.1. This shows that the variables incorporated in the model were not correlated strongly hence suitable to be analyzed in a regression analysis.

4.7 Discussion

This study outlines the existing problems on patient waiting times in outpatient departments within Lusaka's public hospitals and at the same time extend strategic interventions that are consistent with the existing policy frameworks in Zambia. The participants repeatedly stated that three to five hours of waiting is an unacceptable period of time that can be effectively decreased with the help of effective systemic redesign. This observation aligns with the concept of Health Services Quality Improvement Framework (2019-2023), according to which patient satisfaction and timely access are qualitative attributes that must be considered key quality indicators (Villegas et al., 2021). Particularly, the respondents supported the implementation of the SmartCare, the electronic health record system that serves the Republic of Zambia, as a means of making the patient registration process simpler and reducing the waiting times to help the country comply with the principles of the National e-Health Strategy (2017-2021), which treasures the idea of clinical records digitalisation and efficiency of the offered services (Bolton Moore et al., 2022).

The shortage of personnel and inefficient distribution of tasks proved to be some of the salient factors that contributed to the prolongation of waiting times. The given finding is in line with the National Human Resources for Health Strategic Plan (20202030) that cites poor staffing as one of the major bottlenecks of service delivery and, accordingly, suggests maximizing the role of augmentation in recruitment, the fair distribution of workforce, and rotating tasks to enhance efficiency (Ministry of Health, 2020). The participants indicated the importance of additional staffing of the frontline during peak hours and, in that way, supported the need to adopt practical human resource policies in the facilities (Ministry of Health, 2021). At the same time, the use of manual registration and triage systems was also mentioned several times to cause inefficiencies, which the National Health Strategic Plan (2022-2026) refers to when describing service delivery bottlenecks as the hindrance to universal health coverage (Ukonu et al., 2024). Despite policies that promote digitisation and simplified triage models, the accounts of participants show that there is no balanced implementation of measures in different facilities.

Another important issue that was raised was of the need to increase the number of human resources in the health sector. According to the respondents, the lack of physicians, nurses, and ancillary staff was found to be a source of long waiting hours and especially during periods of high traffic. This point can be echoed by the National Health Policy of 2012 which sees sufficient human resources as a cornerstone of health system empowerment (Ministry of Health, 2021). With the operational policies on recruitment in place, there are still issues that hinder operationalisation of these directives even in congested urban areas like Lusaka. Furthermore, the interviewees advised to revive the structured

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appointment systems along with the patient flow management with the digital means, thus, in line with the goals of the e-Health Strategy (2017-2021) and the current SmartCare integration. However, adherence and cultural resistance to the systems of appointments have been noted, highlighting the need to implement health education and technology-induced surveillance to provide the maximum adherence (Beck et al., 2021).

Poor infrastructure was also cited to be one of the major causes of long queues. Such bottlenecks increase the length of stay costs to patients by overcrowded waiting areas, a lack of seats, poor ventilation, and insufficient number of consultation rooms (Ministry of Health, 2021). These assumptions are confirmed in the National Health Strategic Plan (2022-2026), which argues that the infrastructure of city hospitals is not enough to provide primary care to the population and requests making investments in the inpatient departments (Ministry of Health, 2021). It is also further demonstrated by the fact that patients are frequently concentrated either in the mornings or on Mondays, demonstrating the mismatch of capacity and patient behaviour in the facilities(Bolton Moore et al., 2022). In line with the Health Services Quality Improvement Framework (2019-2023), the participants proposed adopting adaptive staffing frameworks to recruit more employees during the times of peak patient flow, which is relevant to both pragmatic and cost-effective ways of managing the overflow.

Despite the fact that the emergency cases should be prioritized, the participants noted the necessity of protocols that will reduce the uproar to the regular outpatient flow (Ministry of Health, 2017). This position corresponds with the Emergency Preparedness and Response Policy of 2017, which is aimed at systematic means of the continuity of vital health facilities in the periods of emergency. Furthermore, it has also been noted that a clear policy on outpatient waiting times is lacking; the participants noted that the available guidelines have the problem of focusing on the challenge of overall quality improvements, as opposed to the willingness to concentrate it on the specific problem. This gap highlights the importance of clear national principles that regulate the waiting times provided by outpatients in the overall Zambia Universal Health Coverage agenda (Oladele et al., 2020).

Synthetically, the results of the study are aligned to the current policy on health in Zambia but reveal gaps in implementation; especially in the areas of human resource, infrastructure, digital uptake, and explicit policy provisions on wait times. The suggestions based on the insights of the participants indicate that even the frontline opinions may be used as the potential input to the national policy and, as a result, provide the chance to create a context-specific, implementable, and constantly monitored national framework of outpatient waiting time (Ministry of Health, 2021).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The long queues of outpatients in the first-level public hospitals in Lusaka have remained a serious issue of concern and it is an indicator of the greater system inefficiency in the health system. The results of Kanyama and Chilenje Hospitals indicate constant overcrowding and time wasted in operations which adversely impact patient satisfaction and overall service delivery. These findings show that there is a clear necessity to make specific interventions that can improve the process of patient flow and the efficiency of the work of outpatient services in general.

5.2 Recommendations

This study suggests optimising procedures by doing systematic workflow and service delivery audits to find bottlenecks in service points, registration, and consultation. Then, processes should be redesigned to reduce delays. By adding more employees at busy times and making sure there are enough administrative and medical resources to handle patient numbers, it further emphasises resource allocation. In order to prioritise critical patients and distribute patient flow uniformly throughout the day, the research also supports the implementation of efficient appointment and triage systems.

It also emphasises the significance of developing healthcare personnel' ability via ongoing training in patient flow management, time management, and service quality enhancement. Furthermore, in order to reliably evaluate outpatient waiting times and provide evidence-based management data, monitoring and evaluation tools like time-motion studies or electronic tracking systems should be employed. Lastly, in order to avoid crowding during peak hours, patients should be informed about the best times to attend and the services that are offered.

REFERENCES

Aeenparast, A., Farzadi, F., Maftoon, F., & Yahyazadeh, H. (2019). Patient Flow Analysis in General Hospitals: How Clinical Disciplines Affect Outpatient Wait Times. *Hospital Practices and Research*, *4*(4), 128–133. https://doi.org/10.15171/hpr.2019.26

Almeida, R., Lopez-Macha, A., Dugatkin, T., Joseph, G., Duron, Y., Hurtado De Mendoza, A., D. Graves, K., & Fejerman, L. (2021). Community research collaboration to develop a promotores-based hereditary breast cancer

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education program for Spanish-speaking Latinas. *Health Education Research*, *36*(3), 319–336. https://doi.org/10.1093/her/cyab011

Beck, D., Veliz, P. T., Munro-Kramer, M., Boyd, C., Sakala, I., Chiboola, N., & Lori, J. (2021). Exploring change over time in community mobilization domains: Results from a maternity waiting home intervention in rural Zambia. *International Journal for Equity in Health*, *20*(1), 228. https://doi.org/10.1186/s12939-021-01557-5

Biya, M., Gezahagn, M., Birhanu, B., Yitbarek, K., Getachew, N., & Beyene, W. (2022). Waiting time and its associated factors in patients presenting to outpatient departments at Public Hospitals of Jimma Zone, Southwest Ethiopia. *BMC Health Services Research*, *22*(1), 107. https://doi.org/10.1186/s12913-022-07502-8

Bolton Moore, C., Pry, J. M., Mukumbwa-Mwenechanya, M., Eshun-Wilson, I., Topp, S., Mwamba, C., Roy, M., Sohn, H., Dowdy, D. W., Padian, N., Holmes, C. B., Geng, E. H., & Sikazwe, I. (2022). A controlled study to assess the effects of a Fast Track (FT) service delivery model among stable HIV patients in Lusaka Zambia. *PLOS Global Public Health*, *2*(8), e0000108. https://doi.org/10.1371/journal.pgph.0000108

Burgoyne, M., Clouston, R., Banerjee, A., Fraser, J., & Atkinson, P. (2020). LO01: What presenting features predict obstetrical outcomes in women who present to the emergency department with early pregnancy bleeding? *CJEM*, *22*(S1), S6–S7. https://doi.org/10.1017/cem.2020.57

Hamoonga, T. E., Mutale, W., Igumbor, J., Bosomprah, S., Arije, O., & Chi, B. H. (2024). Preferences for pre-exposure prophylaxis delivery among HIV-negative pregnant and breastfeeding women in Zambia: Evidence from a discrete choice experiment. *Frontiers in Reproductive Health*, *6*, 1350661. https://doi.org/10.3389/frph.2024.1350661

Kalwar, M. A., Memon, M. S., Khan, M. A., & Tanwari, A. (2021). Statistical analysis of waiting time of patients by queuing techniques: Case study of large hospital in Pakistan. *Journal of Applied Research in Technology & Engineering*, *2*(2), 101. https://doi.org/10.4995/jarte.2021.14741

MacLean, D., Curtin, K. D., Barnabe, C., Bill, L., Healy, B., Holroyd, B. R., Khangura, J. K., & McLane, P. (2025). Interventions to improve equity in emergency departments for Indigenous people: A scoping review. *Academic Emergency Medicine*, *32*(1), 6–19. https://doi.org/10.1111/acem.14987

Ministry of Health. (2021). ZMB_Zambia_National-Health-Strategic-Plan_2017-2021.pdf. *Pediatrics*, *147*(4), e20201767. https://doi.org/10.1542/peds.2020-1767

Mostafa, A. S., Abdalbaky, A., Fouda, E. M., Shaaban, H. H., Elnady, H. G., Hassab-Allah, M., Rashad, M. M., El Attar, M. M., Alfishawy, M., Hussien, S. M., Hamed, T., Hamed, D. H., & Sarhan, D. T. (2020). Practical approach to COVID-19: An Egyptian pediatric consensus. *Egyptian Pediatric Association Gazette*, *68*(1), 28. https://doi.org/10.1186/s43054-020-00037-9

Musey, P. I., Bellolio, F., Upadhye, S., Chang, A. M., Diercks, D. B., Gottlieb, M., Hess, E. P., Kontos, M. C., Mumma, B. E., Probst, M. A., Stahl, J. H., Stopyra, J. P., Kline, J. A., & Carpenter, C. R. (2021). Guidelines for reasonable and appropriate care in the emergency department (GRACE): Recurrent, low-risk chest pain in the emergency department. *Academic Emergency Medicine*, *28*(7), 718–744. https://doi.org/10.1111/acem.14296

Oladele, R., Ogunsola, F., Akanmu, A., Stocking, K., W Denning, D., & Govender, N. (2020). Opportunistic fungal infections in persons living with advanced HIV disease in Lagos, Nigeria; a 12-year retrospective study. *African Health Sciences*, *20*(4), 1573–1581. https://doi.org/10.4314/ahs.v20i4.9

Redhead, G. (2021). 'A British Problem Affecting British People': Sickle Cell Anaemia, Medical Activism and Race in the National Health Service, 1975–1993. *Twentieth Century British History*, *32*(2), 189–211. https://doi.org/10.1093/tcbh/hwab007

Shokouhifar, M., & Ranjbarimesan, M. (2022). Multivariate time-series blood donation/demand forecasting for resilient supply chain management during COVID-19 pandemic. *Cleaner Logistics and Supply Chain*, *5*, 100078. https://doi.org/10.1016/j.clscn.2022.100078

Sialubanje, C., Kaiser, J. L., Ngoma, T., Mwananyanda, L., Fong, R. M., Hamer, D. H., & Scott, N. A. (2023). Postnatal care services in rural Zambia: A qualitative exploration of user, provider, and community perspectives on quality of care. *BMC Pregnancy and Childbirth*, *23*(1), 39. https://doi.org/10.1186/s12884-023-05350-w

Ukonu, I. O., Pauline, E., & Dangana, E. A. (2024). Employee engagement determinants: Pre and post COVID-19 era in an emerging economy's public media industry. *Journal of Health, Applied Sciences and Management*, *8*(1), 5–15. https://doi.org/10.4314/johasam.v8i1.1

Villegas, A. C., Saylor, D., Kvalsund, M., Atadzhanov, M., Chiluba, C., Chishimba, L., Zimba, S., Chomba, M., & Siddiqi, O. K. (2021). Task-shifting to optimize outpatient neurological care in Zambia. *Human Resources for Health*, *19*(1), 88. https://doi.org/10.1186/s12960-021-00619-7

Zafar, S. N., Hazlewood, G., Dhiman, K., Charlton, A., Then, K. L., Dempsey, E., Lester, R., Hoens, A. M., Lacaille, D., Barnabe, C., Rankin, J., Mosher, D., & Barber, C. E. H. (2024). "How are you?" Perspectives From Patients and Health Care Providers of Text Messaging to Support Rheumatoid Arthritis Care: A Thematic Analysis. *ACR Open Rheumatology*, *6*(5), 276–286. https://doi.org/10.1002/acr2.11652

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Factors influencing maternal vaccine acceptance among pregnant women in Kericho East Sub-County, Kenya

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ABSTRACT

Maternal immunization is beneficial to both mothers and their newborns, providing protection against vaccine-preventable diseases. However, vaccination could be affected by vaccine hesitancy, which has been identified by the World Health Organization as one of the top ten threats to global health. Data from the Kenya Demographic and Health Survey (2022) showed that Kericho County had the fifth-highest percentage of women whose most recent births were protected at birth against tetanus. However, factors behind the acceptance of the tetanus vaccine remain largely unexplored, and they could inform the tailoring of information for new vaccines. The specific objectives of this study included determining the level of maternal vaccine acceptance and exploring individual and health system factors that influence maternal vaccine acceptance. The study was guided by the 5-P Model for Vaccine Decision-Making in Pregnancy, and a descriptive cross-sectional design was employed. The target population consisted of pregnant women, with a sample size of 180 respondents determined using Cochran's (1977) formula. Five locations in Kericho East Sub-County were selected through systematic sampling, and random sampling was employed to select the respondents. Data was collected using a semi-structured questionnaire. The Statistical Package for the Social Sciences (SPSS) version 26 was used to analyze the data using descriptive and inferential statistics, including odds ratios and binary logistic regression at a significance level of 0.05. The findings were presented in tables. The study revealed high acceptance of maternal vaccines: tetanus toxoid (TT) at 96%, influenza at 91.4%, RSV at 90.2%, and GBS at 88.4%, if recommended for use during pregnancy. Facilitators of maternal vaccine acceptance included having a postgraduate education (OR = 4.67, $p < 0.01$), as well as knowledge of the RSV vaccine (OR = 3.18, $p = 0.01$) and the GBS vaccine (OR = 3.42, $p < 0.01$). Barriers to maternal vaccine acceptance included living more than 20 km from the nearest health facility (OR=0.11, $p < 0.01$) and not being comfortable discussing maternal vaccines with a healthcare provider (OR=0.32, $p = 0.01$). Maternal vaccine acceptance in Kericho East Sub-County is facilitated by factors like higher education levels, whereas barriers may include living more than 20 kilometers from a health facility. Therefore, to maintain and increase the acceptance of maternal vaccines, public health agencies could leverage the facilitators and address the barriers.

Keywords: Kericho, Maternal, Pregnancy, RSV, Tetanus, Vaccine

I. INTRODUCTION

The United Nations (UN) Sustainable Development Goals target 3.2 provides a target of the reduction of preventable deaths among children under five, specifically lowering neonatal mortality rate (NMR) to at least 12 deaths per 1,000 live births in every country by 2030(UN, 2023). NMR in Sub-Saharan Africa currently stands at approximately 27 deaths per 1,000 live births, and the most of these neonatal deaths result from preventable conditions (World Health Organization, [WHO] 2021). Public health as a field centers primarily on disease prevention. Indeed, disease prevention has long been recognized as crucial in the attainment of good health and prolonging life expectancy, with vaccines occupying a crucial role in preventing vaccine-preventable diseases (Shultz, et al., 2021). Maternal vaccinations are important in significantly reducing maternal, neonatal, and infant mortality and morbidity. Vaccines administered during pregnancy offer direct benefits to the pregnant mother and provides protection to the fetus or newborn through the transplacental transfer of antibodies or by breastfeeding (WHO, 2023).

The Centers for Disease Control and Prevention (CDC) advises that tetanus, diphtheria, and pertussis (Tdap) vaccine be administered to all pregnant mothers between the 27th and 36th week of each pregnancy (CDC, 2022). Equally, the Respiratory syncytial virus (RSV) vaccine is recommended for administration to pregnant women for the protection of their babies—whose immune systems are not fully developed at birth, making them high susceptible to RSV, which can lead to severe bronchiolitis. Group B streptococcus (GBS) is one of the causes of meningitis and neonatal sepsis. Consequently, the WHO General Assembly approved the initiative Defeating Meningitis By 2030: A

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Global Road Map in 2020, which aims to address the primary causes of bacterial meningitis, including meningococcus, pneumococcus, Haemophilus influenzae, and group B streptococcus, among other targets (WHO, 2021).

In Kenya, the tetanus toxoid vaccine is recommended for all expectant women as part of the antenatal care. According to data from Kenya Demographic and Health Survey (KDHS) 2022, 75% of women who had given birth within the preceding two years were reported to have received adequate tetanus toxoid (TT) injections, providing adequate protection for their infants against neonatal tetanus (KNBS and ICF, 2023). Data from the Kenya National Bureau of Statistics (KNBS), according to the National Council for Population and Development (NCPD), on women of reproductive age who participated in the KDHS 2014 revealed that 45.9% had received at least two TT injections, whereas 54.1% had not in Kericho County (NCPD, 2018). However, in 2022, Kericho County was among the top five counties in terms of the percentage of women whose most recent live birth was protected against NT at 87.7%, compared to the national average of 75% (KNBS & ICF, 2023). As a result, conducting the study in Kericho will help identify factors contributing to high acceptance rates and provide strategies to maintain these rates.

The 5-P Model encompasses factors that are relevant and specific to pregnant women's vaccine acceptance, appreciating the fact that there is increased interaction between pregnant women and healthcare providers during pregnancy (Cox, et al., 2023). It also acknowledges that vaccine acceptance during pregnancy involves weighing the benefits and risks for both the mother and the baby. The model includes the following categories of factors (the 5 Ps): perceived information sufficiency on vaccine safety in pregnancy, protection of pregnancy, provider–patient relationship, perceived vaccine benefits for mother and fetus, and perceived disease susceptibility and severity in pregnancy (Cox, et al., 2023).

Kenya's Vision 2030 recognizes quality health as a key element under the Social Pillar, highlighting the importance of reducing the incidence of preventable diseases (GoK, 2007). Specifically, the Kenya National Immunization Policy Guidelines (2023) outline that pregnant women can be vaccinated with Inactivated Influenza, Tetanus-Diphtheria (Td), and Tetanus Toxoid (TT) vaccines. Additionally, Kenya's Health Act No. 21 of 2017 recognizes the importance of addressing maternal and neonatal health, promoting public health, and eliminating preventable diseases (Kenya Law, 2017). Moreover, WHO also acknowledges the need for the use of TT to maintain Kenya's MNTE status (WHO, 2019). Therefore, the findings of the study will outline factors that will help sustain and further enhance maternal vaccine acceptance.

1.1 Statement of the Problem

Maternal vaccination stands as a crucial strategy for reducing maternal and neonatal morbidity and mortality, aligning with targets 3.1 and 3.2 of the Sustainable Development Goal 3, to reduce the global maternal mortality ratio to less than 70 per 100,000 live births and end preventable newborn deaths respectively (UN, 2023). Unfortunately, according to the WHO, the neonatal mortality rate in Sub-Saharan Africa in 2021 stood at 27 deaths per 1,000 live births (WHO, 2021). Neonatal tetanus, for instance, is a fatal disease that can lead to neonatal deaths or leave survivors with lifelong morbidities, such as brain damage and other developmental difficulties. In some countries that have eliminated the disease, there may be underreporting of its occurrence, particularly in rural areas (Naicker, et al., 2022).

Vaccination is one of the best strategies to prevent vaccine-preventable diseases (VPDs) such as neonatal tetanus, which has been recognized as a fatal disease and targeted for elimination by the World Health Organization. However, the availability of safe and effective maternal vaccines does not automatically guarantee acceptance by pregnant mothers. WHO has defined vaccine hesitancy as the "delay in acceptance or refusal of vaccines despite the availability of vaccination services" (WHO, 2015). Consequently, in 2019, WHO declared vaccine hesitancy one of the ten threats to global health (WHO, 2019). With the outbreak of the COVID-19 pandemic and the eventual rollout of vaccines, it is evident that vaccines can be lifesaving, but only when they are administered.

In 2019, Kenya obtained its maternal and neonatal tetanus elimination status. However, one of the recommendations for maintaining this status was the vaccination of women of reproductive age with TTCV, and this is very important, particularly where every county matters when it comes to the elimination of MNT. In the absence of knowledge regarding the drivers of maternal vaccine uptake, policymakers and other duty bearers face the risk of not knowing what to address. Equally, the introduction of crucial vaccines such as RSV and GBS could be faced with challenges. Addressing these gaps is critical for developing strategies to enhance maternal vaccine acceptance. This study sought to identify factors influencing maternal vaccine acceptance among pregnant women in Kericho East Sub-county, Kenya.

1.2 Research Objectives

i. To determine the level of acceptance of maternal vaccines among pregnant women in Kericho East Sub-County, Kenya.
ii. To determine individual factors influencing maternal vaccine acceptance among pregnant women in Kericho East Sub-County, Kenya.

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iii. To determine health system factors influencing maternal vaccine acceptance among pregnant women in Kericho East Sub-County, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 The 5-P Model for Vaccine Decision-Making in Pregnancy

The study employed *The 5-P Model* to predict and explore factors that could influence the decision-making of pregnant women regarding the acceptance of maternal vaccines. Under *The 5-P Model*, different factors are addressed that are well suited to the frequent and intense interactions between pregnant women and healthcare providers during pregnancy. Indeed, the authors characterize pregnancy as an "intense-information" phase (Cox, et al., 2023). Also, unlike many existing models that focus on vaccine hesitancy, this theory focuses on vaccine acceptance during pregnancy.

The 5P Model encompasses perceived information sufficiency on vaccine safety in pregnancy, protection of pregnancy, the (healthcare) provider–patient relationship, perceived vaccine benefits for the mother and fetus, and perceived disease susceptibility and severity during pregnancy (Cox, et al., 2023). The model also recognizes that women exist within a community and, hence, acknowledges the broader sociodemographic determinants of health. This study specifically focused on the interactions between pregnant women and healthcare providers (HCPs) within the wider health system. This included the involvement of healthcare providers in decision-making, HCP attitudes, and trust in HCPs to communicate the benefits and risks associated with maternal vaccines, among other factors. Also included were issues related to the accessibility of healthcare facilities, such as distance.

In addition to health system factors, individual factors such as age, level of education, religious beliefs, and monthly household income were explored. Since the model is fairly new and has not been employed extensively—including critiques of its strengths and weaknesses—this study involved consultations with experts, whose insights were incorporated.

2.2 Empirical Review

2.2.1 Level Of Acceptance of Maternal Vaccines Among Pregnant Women

Presently, tetanus, inactivated influenza, and pertussis-containing vaccines are some of the vaccines recommended for administration during pregnancy (Abu-Raya, et al., 2020). However, just because a vaccine that is safe and effective is available does not automatically mean that it will be accepted (McQuaid, et al., 2016). The acceptance of the maternal tetanus vaccine in Sub-Saharan was at an average of 51.5%, ranging from the lowest in Zambia at 27.5% to the highest in Liberia at 79.2% (Aboagye, et al., 2023). In the Dominican Republic also showed that 94% of the pregnant women surveyed would accept a GBS vaccine if it were offered (Job, et al., 2024). The acceptance of RSV has varied with studies reporting its acceptability in some cases to be ranging from 24% to 48.5% (Giudice, et al., 2023; McClymont, et al., 2025 & McCormack, et al., 2024).

2.2.2 Individual Factors Influencing Maternal Vaccine Acceptance Among Pregnant Women

In their study, Chang et al (2019) established that knowledge of and attitude toward a vaccine also affect its uptake (Chang, et al., 2019). Attitude would often include perception on the safety of the vaccine, among other issues. Misinformation, and even disinformation, regarding the adverse effects of vaccines can cause concern to pregnant women, even when they doubt the credibility of the source of the negative information (Fuss, et al., 2022). Pregnant and breastfeeding women would also worry most about the safety of a maternal RSV vaccine if introduced (Limaye, et al., 2024). Similarly, a survey involving 13,105 women established that, of those who indicated they would decline the COVID-19 vaccine during pregnancy, 34.8% cited concerns about safety and doubts regarding vaccine effectiveness (Naqvi, et al., 2022).

Doubt on vaccine safety, including reports where one would only accept it after observing its effect on early adopters, can affect the acceptance and uptake of new vaccines (Kajungu, et al., 2020). 23.8% of the respondents in a study in South Korea indicated that they were waiting for a larger number of pregnant women to receive the COVID-19 vaccine before deciding to get vaccinated themselves (Yoon, et al., 2022). In the United States, individuals holding a college degree showed a higher likelihood of accepting the GBS vaccine (Geoghegan, et al., 2023).

2.2.3 Health System Factors Influencing Maternal Vaccine Acceptance Among Pregnant Women

The World Health Organization (WHO) revealed that vaccine hesitancy was one of the ten threats to global health in 2019 (WHO, 2019). Vaccine hesitancy is complex, but it is defined by WHO as "the reluctance or refusal to vaccinate despite the availability of vaccines" (WHO, 2019). One of the issues could be distrust toward the healthcare

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system and the pharmaceutical industry, and the perception that side effects are always under-reported. This is one of the issues that could shape perceptions of the safety of maternal vaccines.

National health agencies, such as the Ministry of Health in Kenya, play important roles such as setting policies. In the United Kingdom (UK), 79% of women of childbearing age expressed willingness to receive the GBS vaccine if there was a recommendation for its use by the National Health Service (McQuaid, et al., 2016). This was 27% more than those who would just accept the vaccine without a recommendation from the agency. In Kenya, 90% of expectant mothers in a study believed that all vaccines recommended by the government are beneficial (Otieno, et al., 2020).

Apart from government agencies, health workers are also key influencers and highly trusted when it comes to decision-making concerning vaccination. A study in Kenya established that pregnant women would be willing to accept a vaccine recommended by a healthcare provider, even if they were not aware of the vaccine or the condition it prevents (Nganga, et al., 2019). Similarly, another study also concluded that women would prioritize a healthcare provider over from friends and family when it comes to vaccine recommendations (Geoghegan, et al., 2023). The manner in which healthcare providers interact with pregnant women has been found to influence the acceptance of a vaccine (Msoka, et al., 2023). The significance of a positive attitude of HCPs towards pregnant women in increasing vaccine uptake has also been established in existing studies (Nalubega, et al., 2021).

III. METHODOLOGY

3.1 Study Area

The study was conducted in Kericho East Sub-County in Kericho County. Kericho East Sub-County was purposively selected for it comprises both rural and urban areas. Data has revealed slight differences recorded in the acceptance and uptake of vaccines between women in urban and rural areas (KNBS & ICF, 2023).

3.2 Study Design

This study employed a cross-sectional design, and quantitative data were collected using a structured questionnaire. The cross-sectional study design was suitable for this study, as it sought to establish the level of maternal vaccine acceptance and the factors contributing to this acceptance among pregnant women. The main strength of this study is that it is relatively quick and inexpensive, and the findings could subsequently be used for more in-depth studies (Wang & Cheng, 2020).

3.3 Study Population

The study population comprised eligible expectant women and girls aged 15–49 years in Kericho East Sub-County. The inclusion criteria were women and girls aged 15–49 years who were pregnant at any gestational stage within the chosen areas of Kericho East Sub-County, willing to participate in the study and able provide informed consent. The exclusion criteria included individuals who were unable to provide informed consent, or unwilling to participate in the study, or unable to participate due to physical or mental health reasons.

3.4 Study Variables

The independent variables of the study included individual factors, defined as demographic traits such as age, income level, education level, marital status, occupation, and sources of information on maternal vaccines, as well as health system factors. The dependent variable was maternal vaccine acceptance.

3.5 Sampling Design

Systematic sampling was used to select five locations from the 11 locations in Kericho East Sub-County. Proportionate stratified sampling was then employed to allocate the number of study participants to be chosen from each of the ten sub-locations within the five selected locations. Random sampling was then used to select participants from each sub-location.

Cochran's (1977) formula was used to determine the sample size. Given Z=1.96 for a 95% confidence level, p=0.88, and E=0.05 for a 5% margin of error, the sample size was calculated as follows:

$$n = \frac{1.96^2 \times 0.88 \times (1-0.88)}{0.05^2}$$

$$n = 163$$

Additionally, 10% was added to account for non-response, bringing the total sample size to 180.

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3.6 Data Collection and Analysis

The study was conducted between February and March 2025 using a structured questionnaire to collect quantitative data. The data collection instrument was availed in Kiswahili, which is the national language in Kenya. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 26, and the results were presented using tables.

3.7 Ethical and Logistical Considerations

Approval to conduct the study was sought and obtained from the Masinde Muliro University of Science and Technology (MMUST) Directorate of Postgraduate Studies, and ethical clearance was obtained from the MMUST Institutional Scientific and Ethics Review Committee (MMUST-ISERC). A research permit was also granted by the National Commission for Science, Technology and Innovation (NACOSTI). Ethical principles adhered to included autonomy, informed consent, and confidentiality. Participants under the age of 18 were included in the study only after obtaining consent from their legal guardians, followed by assent from the minors themselves using the study Assent Form, which was written in a language understandable to them.

IV. FINDINGS & DISCUSSION

4.1 Response Rate and Demographic Profile

Of the 180 questionnaires administered, 175 were completed and returned, yielding a 97% response rate. The respondents' demographic profile is presented in Table 1 below.

Table 1

Sociodemographic Characteristics of the Respondents

Factor		
Age (years)	Mean 29.2	Stdev 7.1
Marital Status	**Frequency**	**Percentage**
Single	30	17.1
Married	120	68.6
Separated	5	2.9
Divorced	2	1.1
Widowed	3	1.7
Prefer not to say	15	8.6
Education		
No Formal Education	17	9.7
Primary School	35	20.0
Secondary School	57	32.6
Diploma/Certificate	33	18.9
Undergraduate Degree	30	17.1
Postgraduate Education	3	1.7
Employment		
Unemployed	80	46.0
Self employed	53	30.5
Employed private sector	19	10.9
Civil servant	22	12.6
Average Monthly Household Income		
<10K	79	46.5
10-19.9K	59	34.7
20-29.9K	12	7.1
>30K	20	11.8
Religion		
Christian	171	97.7
Islam	3	1.7
Traditionalist	1	0.6

4.2 Level of Maternal Vaccine Acceptance

The tetanus vaccine, which is recommended had the highest rate, n=165 (96%), while the lowest acceptance was for group B streptococcus, if it were offered. Table 2 illustrates the results.

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Table 2

Vaccine Acceptance

Vaccine	Frequency	Percent
Tetanus vaccine acceptance		
Neutral	7	4
Likely	167	96
Influenza vaccine acceptance		
Unlikely	2	1.1
Neutral	13	7.5
Likely	159	91.4
Group B strep vaccine acceptance		
Unlikely	4	2.3
Neutral	16	9.2
Likely	153	88.4
RSV vaccine acceptance		
Unlikely	5	2.9
Neutral	12	6.9
Likely	157	90.2

The overall acceptance of the TT vaccine among the respondents was 96%, and this is the only vaccine routinely recommended for administration to pregnant women in Kenya. The acceptance of the maternal tetanus toxoid vaccine was higher than that reported in a study that focused on Sub-Saharan Africa, where the average level of acceptance was 51.5% (Aboagye, et al., 2023).

Although not currently recommended, the majority of the women (91.4%) expressed a willingness to accept the influenza vaccine if it were offered. This finding is slightly higher than that of another study conducted in Kenya, where 77.8% of the pregnant women involved stated that they would be willing to accept the influenza vaccine if it were offered (Otieno et al., 2020). The acceptance level in a different study was 83.7% (Otieno et al., 2020). The findings show that there is a high likelihood that pregnant women would accept the influenza vaccine if introduced.

The high acceptance of a future RSV vaccine, despite low knowledge about it, indicates women's willingness to protect their babies against RSV. This is in contrast to the findings of a study conducted in Ireland, where, although the majority of pregnant women had not heard about RSV (75.6%), only 48.5% of them were willing to have the RSV vaccine availed (McCormack, et al., 2024). This was also contrary to another study in Canada focused on pregnant and postpartum individuals, which found that only 24% would accept the RSV vaccine during pregnancy (McClymont, et al., 2025).

Of the three vaccines not currently recommended by the Ministry of Health, Kenya, the least accepted was the GBS vaccine, with an acceptance rate of 88.4%. The findings from another study conducted in the Dominican Republic also showed that 94% of the pregnant women surveyed would accept a GBS vaccine if it were offered (Job, et al., 2024). The acceptance in this study was higher than the findings of a study in which the acceptability of the GBS vaccine, if offered to women in the US and Ireland, was 55% and 56%, respectively (Geoghegan, et al., 2023). The finding was contrary to that of another study conducted in China, where the level of acceptance of a GBS vaccine, if offered, was only 45.76%, even though the majority of the respondents (59.6%) had heard of GBS but were not familiar with it (Du, et al., 2023).

4.3 Individual Factors Influencing Maternal Vaccine Acceptance

Women with a post-graduate level of education were over 4.5 times more likely to accept vaccines than the uneducated ones (OR= 4.67, 95% ci= 1.19-18.29). Additionally, women from households with monthly incomes between 20-29k were 78% less likely to accept vaccines than those under 10k a month (OR= 0.22, 95% ci= 0.19-1.69). Table 3 summarizes the results.

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Table 3

Demographic Predictors of Vaccine Acceptance

Predictor	Category	OR (95% ci)	p value
Age		0.98(0.9-1.06)	0.61
Children born		1.14(0.63-2.06)	0.66
Marital	Withheld	2.03(0.27-15.26)	0.49
	Widowed	**1.87(1.21-2.89)**	**0.04**
	Divorced	**2.97(0.72-12.21)**	**0.00**
	Separated	3.42(0.28-41.58)	0.34
	Married	1.01(0.23-4.5)	0.99
	Single	1(0-0)	
Education	**Postgraduate**	**4.67(1.19-18.29)**	**0.00**
	Degree	1.29(0.16-10.59)	0.81
	Diploma/Certificate	0.33(0.06-1.93)	0.22
	Secondary	0.63(0.12-3.24)	0.58
	Primary	0.22(0.03-1.72)	0.15
	No Education	1(0-0)	
Employment	Civil servant	1.06(0.06-19.52)	0.97
	Employed private sector	3.35(0.31-36.79)	0.32
	Self employed	1.24(0.13-11.72)	0.85
	Unemployed	1(0-0)	
HH income	>30K	0.78(0.04-1.58)	0.10
	20-29.9K	**0.22(0.19-1.69)**	**0.00**
	10-19.9K	0.72(0.1-5.15)	0.74
	<10K	1(0-0)	
Religion	**Traditionalist**	**0.05(0.04-0.07)**	**0.00**
	Islam	0.68(0.02-30.08)	0.84
	Christian	1(0-0)	

The study reveals that, compared to single expectant women, those who were widowed were almost twice as likely to accept vaccination (OR = 1.87, 95% CI = 1.21–2.89), while those who were divorced were almost thrice as likely (OR = 2.97 95% CI = 0.72-12.21). This was contrary to the finding of a study conducted in Brazil, where being single/widowed/divorced increased the likelihood of a woman being unvaccinated for tetanus compared to married women. (Faria, et al., 2021). However, this would require further investigation, as only 1.1% of the respondents reported that they were divorced, while another 1.7% reported that they were widowed. Though the likelihood of accepting a maternal vaccine for a traditionalist was 95% less than that of a Christian, this finding might not be practically meaningful, as only one respondent was a traditionalist. However, previous findings have established the association between religion and vaccine acceptance due to factors such as the influence of religious leaders and beliefs, for instance, that diseases only affect nonbelievers (Aynalem, et al., 2022 & Chimukuche, et al., 2022).

Education level has been one of the factors associated with vaccine acceptance and hesitancy. In this study, respondents with a postgraduate degree were almost five times more likely to accept a maternal vaccine compared to those with no formal education. The results were similar to a study conducted in Ethiopia, where education status was one of the factors associated with vaccine acceptance. In that study, individuals with a college education or higher were more than twice as likely to accept a vaccine compared to those with only a primary education (Getachew, et al., 2022). It is almost similar to the finding of a study conducted in Ethiopia, where individuals with a college education or higher were more than twice as likely to accept a vaccine compared to those with only a primary education (Getachew et al., 2022). However, the findings in this study contrast with those of a study in Senegal, where a higher education level among individuals in the diaspora was linked to increased vaccine hesitancy among their family members back home as they were likely to influence them (Johm, et al., 2021). The association between a pregnant woman's education level and maternal vaccine acceptance may be linked to the greater exposure to information about the importance of vaccines.

Economic factors are likely to affect vaccine acceptance, especially in instances such as having clinic days on weekdays, as is the practice in many Level 2 and 3 government facilities in Kenya. This study revealed that having an average monthly household income of between KES 20,000 and KES 30,000 was associated with a woman being 78% less likely to accept a maternal vaccine compared to those whose average monthly income was less than KES 10,000. This contradicts a finding in a study conducted in Malaysia, where higher household income and employment were

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associated with increased vaccine acceptance (Kalok, et al., 2023). This finding supports the conclusion by Msoka et al. that in regions where women must choose between working and attending clinics for vaccines on certain days, they would opt for work over attending the clinics (Msoka, et al., 2023). This factor is particularly relevant in our context where ANC clinics operate on specific days, necessitating that women adhere to these scheduled appointments.

4.4 Health System Factors Influencing Maternal Vaccine Acceptance

As shown in table 4, Stock outs were mostly rare, the modal distance to the facility was 1-5km n=56 (32.4%), with a further 15% (n=26) living within a kilometre of the nearest facility offering vaccination. Half of the expectant women covered between 6-20 km to get to the nearest facility with vaccination services. Nonetheless, most of the women rated the ease of access to the nearest health facility for vaccination as either easy, n=111 (64.2%), or very easy n= 13 (7.5%).

Table 4

Health Facility Access Factors

Factor	Category	Frequency	Percentage
Distance to nearest facility	<1km	26	15.0
	1-5km	56	32.4
	6-10 km	44	25.4
	11-20km	44	25.4
	>20 km	3	1.7
Access to nearest facility	Very easy	13	7.5
	Easy	111	64.2
	Neutral	15	8.7
	Difficult	33	19.1
	Very difficult	1	0.6
Average spending for vaccine	<100	41	24.6
	100-200	40	23.4
	200-300	45	26.3
	300-400	17	9.9
	>400	27	15.8
Stock outs	Never	26	15.3
	Rarely	65	38.2
	Sometimes	73	42.9
	Often	6	3.5

98.3% of the respondents reported that they were comfortable discussing maternal vaccines with their health care providers (HCPs). Further, 94.9% trusted their HCPs to honestly tell them about the benefits and risks of vaccines. However, 75% felt that HCPs were unlikely to involve them in decision-making about a maternal vaccine through providing them with information so they could make an informed decision. Table 5 shows the results.

Table 5

Healthcare Provider Factors

Factor	Disagree	Neutral	Agree
Comfortable discussing maternal vaccine with HCP			
Frequency	1	2	171
Percentage	0.6	1.1	98.3
Receive adequate information about maternal vaccines from HCP			
Frequency	1	4	169
Percent	0.6	2.3	97.1
Trust Healthcare provider for Information on vaccine risks and benefits			
Frequency	1	8	165
Percent	0.6	4.6	94.9
Involved decision by HCP on vaccine decision			
Frequency	130	28	16
Percent	74.7	16.1	9.2

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Accessibility in the study was measured based on the average cost incurred by pregnant women and their opinion of the overall ease or otherwise of reaching the nearest health facility where they could receive the maternal vaccine. Those whose average expenditure to get vaccinated were below KES. 100 were 22 times more likely than those spending over KES. 400 to accept maternal vaccines. Additionally, women who were over 20 kilometre from the nearest facility were 89% less likely to accept vaccination than those living less than 1 kilometre from the health facility (OR = 0.11, 95% ci= 0.02-0.54). Table 6 shows the results.

Table 6

Health System Factors Influencing Maternal Vaccine Acceptance

Factor	Response	OR (95% ci)	p value
Comfortable discussing vaccine with HCP	**No**	**0.32(0.26-0.38)**	**0.00**
	Yes	Ref	
Receive adequate information	No	7.23(0.76-68.68)	0.09
	Yes	Ref	
Trust HCP on risk/benefits	**No**	**4.04(0.99-16.43)**	**0.05**
	Yes	Ref	
Involved decision by HCP	No	3.67(0.36-37.06)	0.27
	Yes	Ref	
Access to nearest facility	Difficult	0.87(0.21-3.61)	0.84
	Easy	Ref	
Average spending to get vaccine	**<100**	**22.74(1.29-40.44)**	**0.03**
	100-200	3.08(0.41-23.44)	0.28
	200-300	1.73(0.29-10.46)	0.55
	300-400	1.46(0.25-8.44)	0.67
	>400	Ref	
Distance to nearest facility	**>20 km**	**0.11(0.02-0.54)**	**0.00**
	11-20km	1.42(0.34-5.84)	0.63
	6-10 km	0.55(0.15-1.93)	0.35
	1-5km	0.95(0.26-3.42)	0.94
	<1km	Ref	
Stock outs	Never	1.67(0.24-11.45)	0.60
	Rarely	0.41(0.13-1.32)	0.14
	Sometimes	0.76(0.25-2.28)	0.62
	Often	Ref	

The results of the binary regression analysis in this study show that women whose average spending was below KES 100 were 22 times more likely to accept a maternal vaccine compared to those who would spend more than KES 400 to access a vaccine. The vaccines are offered free of charge, and hence this was the amount they would spend on transportation and other associated costs. The findings were similar to those of another study conducted in The Gambia and Senegal found that the distance to health facilities, combined with factors such as accessibility and issues with public transportation, were some of the factors influencing the uptake of maternal vaccinations (Johm, et al., 2021). Similarly, in Ethiopia, a study found that the accessibility of the TT vaccine delivery point was highly associated with the utilization of the vaccine (Anatea, et al., 2018). Besides the cost of travel to the health facility, time is another factor when the distance to the facility is far. As many women could be preoccupied with household chores that consume a significant amount of time, along with the costs associated with travel, this could explain the association between distance and travel expenses and the acceptance of a maternal vaccine.

Nganga et al. found in their study that pregnant women trust healthcare providers due to their societal standing as trained professionals. (Nganga, et al., 2019). In this study, those who did not trust their healthcare providers to honestly inform them about the risks and benefits of maternal vaccines were four times more likely to accept a vaccine compared to those who did trust their healthcare providers to communicate about the benefits and risks. However, it is important to note that this group comprised only 5.2% of the respondents. Equally, those who did not feel comfortable discussing maternal vaccines with their HCPs were 68 times less likely than those who did to accept a maternal vaccine.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study demonstrates a high acceptance of maternal vaccines among pregnant women. The top three trusted sources of information on maternal vaccines were healthcare providers, the Ministry of Health, and spouses. Information from these sources would be influential in the decision of a pregnant woman whether to accept a vaccine. Despite a majority of the respondents reporting that they were comfortable discussing vaccines with healthcare providers (98.3%), 75% of them felt excluded from the vaccination decision-making process. These findings show the willingness of pregnant women to accept maternal vaccines and their desire to be included in the vaccine decision-making process.

5.2 Recommendations

The trust and confidence pregnant women have in healthcare providers can be leveraged to enhance vaccine acceptance by actively involving women in the decision-making process. Small group sessions during antenatal care clinics could enhance informed decision-making without significantly increasing the time burden on healthcare providers if an individual one-on-one approach is not taken for each woman. The factors behind the acceptance of GBS and RSV vaccines by 88.4% and 90.2% of the respondents, respectively, if offered, could be discovered through subsequent in-depth studies employing qualitative data collection strategies.

REFERENCES

Aboagye, R. G., Amu, H., Dowou, R. K., Bansah, P., Oaikhena, I. O., & Bain, L. E. (2023). Prevalence and correlates of tetanus toxoid uptake among women in sub-Saharan Africa: Multilevel analysis of demographic and health survey data. *PLOS ONE, 18*(12), e0296174. https://doi.org/10.1371/journal.pone.0296174

Abu-Raya, B., Maertens, K., Edwards, K. M., Omer, S. B., Englund, J. A., Flanagan, K. L., ... Cavaliere, A. F. (2020). Global perspectives on immunization during pregnancy and priorities for future research and development: An international consensus statement. *Frontiers in Immunology, 11*, 1282. https://doi.org/10.3389/fimmu.2020.01282

Anatea, M. D., Mekonnen, T. H., & Dachew, B. A. (2018). Determinants and perceptions of the utilization of tetanus toxoid immunization among reproductive-age women in Dukem Town, Eastern Ethiopia: A community-based cross-sectional study. *BMC International Health and Human Rights, 18*, 27. https://doi.org/10.1186/s12914-018-0168-0

Aynalem, B. Y., Melesse, M. F., & Zeleke, L. B. (2022). COVID-19 vaccine acceptability and determinants among pregnant mothers attending antenatal care services at Debre Markos town public health institutions, Debre Markos Northwest Ethiopia: Mixed study. *Pan African Medical Journal, 41*, 293. https://doi.org/10.11604/pamj.2022.41.293.32618

Centers for Disease Control and Prevention. (2022, December 1). Get a whooping cough vaccine during each pregnancy. https://www.cdc.gov/pertussis/vaccines/tdap-vaccination-during-pregnancy.html?CDC_AAref_Val=https://www.cdc.gov/pertussis/pregnant/mom/get-vaccinated

Chang, Y.-W., Tsai, S.-M., Lin, P.-C., & Chou, F.-H. (2019). Willingness to receive influenza vaccination during pregnancy and associated factors among pregnant women in Taiwan. *Public Health Nursing, 36*(3), 284–295. https://doi.org/10.1111/phn.12600

Chimukuche, R. S., Ngwenya, N., Seeley, J., Nxumalo, P. S., Nxumalo, Z. P., Godongwana, M., Radebe, N., Myburgh, N., Adedini, S. A., & Cutland, C. (2022). Assessing community acceptance of maternal immunisation in rural KwaZulu-Natal, South Africa: A qualitative investigation. *Vaccines (Basel), 10*(3), 415. https://doi.org/10.3390/vaccines10030415

Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). John Wiley & Sons.

Cox, E., Sanchez, M., Taylor, K., Baxter, C., Crary, I., Every, E., Futa, B., & Adams Waldorf, K. M. (2023). A mother's dilemma: The 5-P model for vaccine decision-making in pregnancy. *Vaccines (Basel), 11*(7), 1248. https://doi.org/10.3390/vaccines11071248

Du, J., Ji, W., Zhao, H., McIver, D. J., Zhao, Y., Chang, J., & Fang, Y. (2023). Preferences of pregnant women toward a future maternal Group B Streptococcus vaccine in China: A cross-sectional survey with a discrete choice experiment. *Human Vaccines & Immunotherapeutics, 19*(3), 2281713. https://doi.org/10.1080/21645515.2023.2281713

Faria, A. P., Silva, T. P., Vieira, E. W., Lachtim, S. A., Rezende, E. M., & Matozinhos, F. P. (2021). Factors associated with tetanus vaccination in pregnant women living in Minas Gerais State, Brazil: A cross-sectional study. *Public Health in Practice, 2*, 100203. https://doi.org/10.1016/j.puhip.2021.100203

Licensed Under Creative Commons Attribution (CC BY-NC)

Fuss, T. L., Devera, J. L., Pierre-Joseph, N., & Perkins, R. B. (2022). Attitudes and communication preferences for vaccines among pregnant women receiving care at a safety-net hospital. *Women's Health Issues*, *32*(1), 67–73. https://doi.org/10.1016/j.whi.2021.09.004

Geoghegan, S., Faerber, J., Stephens, L., Gillan, H., Drew, R. J., Eogan, M., Feemster, K. A., & Butler, K. M. (2023). Preparing for Group B Streptococcus vaccine: Attitudes of pregnant women in two countries. *Human Vaccines & Immunotherapeutics*, *19*(1), 2195331. https://doi.org/10.1080/21645515.2023.2195331

Getachew, T., Balis, B., Eyeberu, A., Debella, A., Nigussie, S., Habte, S., Eshetu, B., Bekele, H., Alemu, A., & Dessie, Y. (2022). COVID-19 vaccine acceptance among pregnant women attending antenatal care in public hospitals in eastern Ethiopia: A multi-center facility-based cross-sectional study. *Public Health in Practice*, *4*, 100338. https://doi.org/10.1016/j.puhip.2022.100338

Giudice, G. M., Sansone, V., Airoma, F., Angelillo, S., Licata, F., & Giuseppe, G. D. (2023). Respiratory syncytial virus: Willingness towards a future vaccine among pregnant women in Italy. *Vaccines*, *11*(11), 1691. https://doi.org/10.3390/vaccines11111691

Government of Kenya. (2007). *Kenya Vision 2030*. The National Treasury and Economic Planning: State Department for Economic Planning. https://vision2030.go.ke/publication/kenya-vision-2030-popular-version/

Job, M. J., Kim, D., Acosta, F., Valera, S., Fernandez, A., Laycock, K. M., Ratner, A. J., Steenhoff, A. P., Feemster, K., & Geoghegan, S. (2024). Attitudes of pregnant women in the Dominican Republic towards a future maternal Group B Streptococcus vaccine. *Vaccine*, *42*(22), 126169. https://doi.org/10.1016/j.vaccine.2024.126169

Johm, P., Nkoum, N., Ceesay, A., Mbaye, E. H., Larson, H., & Kampmann, B. (2021). Factors influencing acceptance of vaccination during pregnancy in The Gambia and Senegal. *Vaccine*, *39*(29), 3926–3934. https://doi.org/10.1016/j.vaccine.2021.05.068

Kajungu, D., Muhoozi, M., Stark, J., Weibel, D., & Sturkenboom, M. C. (2020). Vaccines safety and maternal knowledge for enhanced maternal immunization acceptability in rural Uganda: A qualitative study approach. *PLOS ONE*, *15*(12), e0243834. https://doi.org/10.1371/journal.pone.0243834

Kalok, A., Dali, W. R., Sharip, S., Abdullah, B., Kamarudin, M., Dasrilsyah, R. A., Abdul Rahman, R., & Atan, I. K. (2023). Maternal COVID-19 vaccine acceptance among Malaysian pregnant women: A multicenter cross-sectional study. *Frontiers in Public Health*. https://doi.org/10.3389/fpubh.2023.1092724

Kenya Law. (2017). *The Health Act: No. 21 of 2017*. National Council for Law Reporting.

Kenya National Bureau of Statistics (KNBS), & ICF. (2023). *Kenya Demographic and Health Survey 2022: Key indicators report*. Nairobi, Kenya, and Rockville, Maryland, USA.

Limaye, R. J., Singh, P., Fesshaye, B., & Karron, R. A. (2024). Lessons learned from COVID-19 vaccine acceptance among pregnant and lactating women from two districts in Kenya to inform demand generation efforts for future maternal RSV vaccines. *BMC Pregnancy and Childbirth*, *24*, 221. https://doi.org/10.1186/s12884-024-06425-y

McClymont, E., Wong, J. M. H., Forward, L., Blitz, S., Barrett, J., Bogler, T., Boucoiran, I., Castillo, E., D'Souza, R., El-Chaâr, D., Fadel, S. A., Gantt, S., Kuret, V., Ogilvie, G., Poliquin, V., Sadarangani, M., Scott, H., Snelgrove, J. W., Tunde-Byass, M., & Money, D.; COVERED Team. (2025). Acceptance and preference between respiratory syncytial virus vaccination during pregnancy and infant monoclonal antibody among pregnant and postpartum persons in Canada. *Vaccine*, *50*, 126818. https://doi.org/10.1016/j.vaccine.2025.126818

McCormack, S., Thompson, C., Nolan, M., Imcha, M., Dee, A., Saunders, J., & Philip, R. K. (2024). Maternal awareness, acceptability and willingness towards respiratory syncytial virus (RSV) vaccination during pregnancy in Ireland. *Immunity, Inflammation and Disease*, *12*(4), e1257. https://doi.org/10.1002/iid3.1257

McQuaid, F., Jones, C., Stevens, Z., Plumb, J., Hughes, R., Bedford, H., Voysey, M., Heath, P. T., & Snape, M. D. (2016). Factors influencing women's attitudes towards antenatal vaccines, group B Streptococcus and clinical trial participation in pregnancy: An online survey. *BMJ Open*, *6*(4), e010790. https://doi.org/10.1136/bmjopen-2015-010790

Msoka, A. C., Kipengele, A. H., Cyril, P. M., Laizer, S. N., Lintu, Z., Naftal, M., Yongolo, N. M., Biswalo, S., Haule, L., Ng'unda, N. A., & Mmbaga, B. T. (2023). Community support for maternal vaccinations in Kilimanjaro region, Tanzania: Qualitative study. *International Research Journal of Public and Environmental Health*, *10*(2), 35–44. https://doi.org/10.15739/irjpeh.23.004

Naicker, L., Verster, E., & Nariansamy, L., Sourour, G. (2022). Neonatal tetanus: An old enemy still lurking around in 2021. *South African Journal of Child Health*, *16*(3), 178–179. https://doi.org/10.7196/SAJCH.2022.v16i3.1887

Nalubega, P., Karafillakis, E., Atuhaire, L., Akite, P., Zalwango, F., Chantler, T., Cochet, M., Seeley, J., & Le Doare, K. (2021). Maternal vaccination in Uganda: Exploring pregnant women, community leaders and healthcare workers' perceptions. *Vaccines (Basel)*, *9*(6), 552. https://doi.org/10.3390/vaccines9060552

Naqvi, S., Saleem, S., Naqvi, F., Billah, S. M., Nielsen, E., Fogleman, E., Peres-da-Silva, N., Figueroa, L., Mazariegos, M., Garces, A. L., Patel, A., Das, P., Kavi, A., Goudar, S. S., Esamai, F., Chomba, E., Lokangaka, A., Tshefu,

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A., Haque, R., Siraj, S., Yousaf, S., Bauserman, M., Liechty, E. A., Krebs, N. F., Derman, R. J., Carlo, W. A., Petri, W. A. Jr, Hibberd, P. L., Koso-Thomas, M., Thorsten, V., McClure, E. M., & Goldenberg, R. L. (2022). Knowledge, attitudes, and practices of pregnant women regarding COVID-19 vaccination in pregnancy in 7 low- and middle-income countries: An observational trial from the Global Network for Women and Children's Health Research. *BJOG*, *129*(12), 2002–2009. https://doi.org/10.1111/1471-0528.17226

National Council for Population and Development (NCPD). (2018). *Insights on population issues in Kenya to enhance knowledge management – Tetanus toxoid vaccination and stock out of family planning commodities*. Nairobi, Kenya.

Nganga, S. W., Otieno, N. A., Adero, M., Ouma, D., Chaves, S. S., Verani, J. R., Widdowson, M. A., Wilson, A., Bergenfeld, I., Andrews, C., Fenimore, V. L., Gonzalez-Casanova, I., Frew, P. M., Omer, S. B., & Malik, F. A. (2019). Patient and provider perspectives on how trust influences maternal vaccine acceptance among pregnant women in Kenya. *BMC Health Services Research, 19*, 747. https://doi.org/10.1186/s12913-019-4537-8

Otieno, N. A., Otiato, F., Nyawanda, B., Adero, M., Wairimu, W. N., Ouma, D., Atito, R., Wilson, A., Gonzalez-Casanova, I., Malik, F. A., Widdowson, M. A., Omer, S. B., Chaves, S. S., & Verani, J. R. (2020). Drivers and barriers of vaccine acceptance among pregnant women in Kenya. *Human Vaccines & Immunotherapeutics*, *16*(10), 2429–2437. https://doi.org/10.1080/21645515.2020.1723364

Shultz, J. M., Sullivan, L. M., Galea, S., & Abdalla, S. M. (2021). At the heart of public health: Prevention and health equity. In J. M. Shultz, L. M. Sullivan, & S. Galea (Eds.), *Public health: An introduction to the science and practice of population health* (pp. 56–58). Springer Publishing Company.

United Nations. (2023). *Sustainable Development: Ensure healthy lives and promote well-being for all at all ages*. https://sdgs.un.org/goals/goal3#overview

Wang, X., & Cheng, Z. (2020). Cross-sectional studies: Strengths, weaknesses, and recommendations. *Chest, 158*(1S), S65–S71. https://doi.org/10.1016/j.chest.2020.03.012

World Health Organization. (2019a, February 22). Kenya now eliminates maternal and neonatal tetanus. https://www.afro.who.int/news/kenya-now-eliminates-maternal-and-neonatal-tetanus

World Health Organization. (2019b, January 21). Ten threats to global health in 2019. https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019

World Health Organization. (2021a). Defeating meningitis by 2030. https://www.who.int/initiatives/defeating-meningitis-by-2030

World Health Organization. (2021b). SDG Target 3.2: End preventable deaths of newborns and children under 5 years of age. https://www.who.int/data/gho/data/themes/topics/sdg-target-3_2-newborn-and-child-mortality

World Health Organization. (2023, January 22). Updates on monitoring safety during pregnancy and breastfeeding projects: PERLA and COVID-19 pregnancy cohort study. https://www.who.int/groups/global-advisory-committee-on-vaccine-safety/topics/pregnancy-and-lactation/vaccines#:~:text=Maternal%20immunization%20can%20protect%20the,the%20fetus%20prior%20to%20birth

Yoon, H., Choi, B. Y., Seong, W. J., Cho, G. J., Na, S., Jung, Y. M., Jo, J. H., Ko, H. S., & Park, J. S. (2022). COVID-19 vaccine acceptance during pregnancy and influencing factors in South Korea. *Journal of Clinical Medicine, 11*(19), 5733. https://doi.org/10.3390/jcm11195733

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Assessing continuous professional development practices for TVET trainers of trainers in Uganda: A mixed-methods study

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ABSTRACT

Technical and Vocational Education and Training (TVET) is central to equipping learners with practical and employable skills in Uganda. The quality of this training hinges on the competence of TVET master trainers, which is sustained through Continuous Professional Development (CPD). This study assessed the current CPD practices available for TVET master trainers in instructor training institutions in Uganda and examined their relationship with the professional competences of TVET master trainers. This study was grounded in the Experiential Learning Theory (ELT). A convergent parallel mixed-methods research design within a descriptive framework was employed, collecting data via questionnaires, interviews, and document analysis from 166 master trainers, administrators, trainees, and policymakers, achieving an 87.5% response rate. The findings reveal that CPD programs are regularly organized and perceived as relevant, yet their implementation is fragmented, inaccessible to many, and heavily reliant on donor support and individual initiative. A significant positive correlation was found between CPD practices and trainer competences ($r = 0.459$). Critically, regression analysis established that current CPD practices explain 21% of the variance in the professional competences of TVET master trainers ($R^2 = 0.211$). This underscores the substantial, yet under-optimized, role of CPD. The study concludes that, despite a positive relationship, CPD delivery in Uganda remains inconsistent. It recommends the establishment of a robust national CPD framework, formalized industry partnerships, improved accessibility through blended learning, and the integration of CPD participation into career progression and reward systems to enhance its effectiveness and impact.

Keywords: Continuous Professional Development, Instructor Training Institutions, TVET Master Trainers, Trainer Competences

I. INTRODUCTION

Globally, the attention to Technical Vocational Education and Training (TVET) is on the rise, underpinned by a belief in its capacity to strengthen economic growth, a national competitiveness and development. TVET is considered essential in addressing the problems of globalization, climate change, and knowledge and skill gaps in achieving the Sustainable Development Goals (SDGs). TVET has the potential of transforming education systems by aligning them with the demands of advanced technologies, growing industries, and knowledge-based economies (Hasanah et al., 2025). The researcher was motivated by the ideology that in lifetime history, TVET has been considered a programme for preparing trainees for the world of work. Until today, the perception about TVET persists that even countries with desirable education systems like Finland, China, South Korea, Japan, Singapore, Germany, and Norway still envisage TVET as a springboard for a sustainable future (Hlatjwako et al., 2025). UNESCO-UNEVOC's policies, notably its Medium-Term Strategy 2024-2026, emphasise transformation (TVET) to meet the needs of a changing world. The primary initiatives include providing adolescents and adults with job and entrepreneurial skills, boosting innovation, promoting fairness and inclusion, and assisting the global economy's "dual green and digital transformation". TVET has been a consistent international emphasis for decades, with countries such as China, India, Saudi Arabia, South Korea, and Uganda investing in it.

A TVET Master Trainer is a specialized professional who develops the skills and capabilities of TVET instructors. Their major responsibility is to teach, coach, and assist TVET trainers so that they may effectively provide competency-based education that satisfies industry requirements. TVET master trainer aim to improve trainers' technical and pedagogical abilities, such as curriculum building, instructional delivery, and learner assessment. ToTs contribute significantly to the overall quality and relevance of technical and vocational education and training systems by providing trainers with current information, effective teaching methodologies, and industry-relevant approaches (Ministry of Education and Sports [MoES], 2016).

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Technical Vocational Education and Training (TVET) is central to equipping learners with practical and employable skills that meet the demands of Uganda's dynamic labor market (Barigye, 2024). The quality of training within this sector depends heavily on the competence of TVET trainers, who are tasked with delivering competency-based and industry-relevant instruction. To maintain relevance in changing economic and technological contexts, these trainers require ongoing support through structured capacity-building initiatives, particularly continuous professional development (CPD) (Niyomushobozi & Kiarie, 2024).

Uganda has introduced several reforms aimed at revitalizing the TVET sector, including the Skilling Uganda Strategy (2012–2022) and the TVET Policy (2019) (Kim, 2021). Both frameworks emphasize the critical role of CPD in improving the quality of instruction and aligning training programs with industry standards. However, CPD practices in Uganda's instructor training institutions remain fragmented, often depending on donor support, short-term projects, or institution-specific initiatives. Studies have highlighted limited institutional capacity, weak monitoring structures, and inconsistent funding as persistent barriers to effective CPD implementation (Okware & Ngaka, 2017; Mutebi & Ferej, 2023). These challenges have resulted in uneven professional competences among trainers and constrained the sector's ability to deliver high-quality skills training.

Assessing the current CPD practices in instructor training institutions becomes critical. Understanding what strategies are in place, how they are implemented, and the extent to which they enhance professional competences of TVET master trainers can provide a clearer picture of both progress and gaps. This study therefore set out to examine the current CPD practices available for TVET master trainers in Uganda's instructor training institutions and to test whether these practices significantly relate to the professional competences of trainers. The findings are expected to inform evidence-based policy reforms, strengthen institutional CPD frameworks, and promote sustainable capacity development in the TVET sector.

1.1 Statement of the Problem

Uganda Vision 2040, the Fourth National Development Plan (NDP IV), the African Union's Agenda 2063, the Continental Education Strategy for Africa (CESA), and the Sustainable Development Goals (SDGs) all position Technical and Vocational Education and Training (TVET) as a key driver of industrialization, innovation, and inclusive economic growth. These frameworks envision a robust TVET system sustained by highly competent Master trainers (ToTs) equipped with modern technical, pedagogical, and industry-relevant skills to produce a skilled, employable, and innovative workforce (MoES, 2016). Ideally, ToTs should embody occupational expertise, andragogical competence, and soft skills that enable learner-centred instruction, innovation, research, assessment, and mentorship, all essential to achieving sustainable national development goals.

However, the current reality in Uganda's TVET sector sharply contrasts with this vision. Despite policy recognition of TVET's importance, the system is undermined by weak institutional capacity and a near-total absence of a structured, continuous professional development (CPD) framework. Existing CPD initiatives are sporadic, donor-driven, and lack coordination, standardization, and linkage to career advancement (Kintu et al., 2019). Many ToTs operate with outdated technical and pedagogical knowledge, minimal industry exposure, and within poorly resourced institutions with limited digital infrastructure (Agole et al., 2022). These challenges are compounded by chronic underfunding, with TVET receiving only 0.4% of the national education budget (Mutebi & Ferej, 2023), making sustainable CPD nearly impossible. Consequently, efforts to implement competence-based training have had limited success due to the absence of systemic investment and institutional support mechanisms.

The persistent CPD deficit has far-reaching implications. Institutionally, it perpetuates outdated instructional methods, low morale, and inefficient resource utilization. At the national level, it fuels a skills mismatch between graduates and labour market demands, leading to high youth unemployment and low productivity (Okware & Ngaka, 2017). Internationally, it weakens Uganda's progress toward SDG 4 (Quality Education) and SDG 8 (Decent Work and Economic Growth). This study, therefore, seeks to empirically examine the gaps in CPD practices for TVET ToTs, analyze mechanisms for identifying training needs, and propose contextually grounded strategies for a sustainable, coordinated, and impactful CPD framework. The findings aim to guide policy formulation and institutional reforms that enhance trainer competence and strengthen the overall quality of Uganda's TVET system.

1.2 Research Objective

Assess the current CPD practices available for TVET master trainers in instructor training institutions in Uganda.

1.3 Research Hypothesis

Ho_2: There is a significant relationship between the current CPD practices implemented in instructor training institutions and the professional competences of TVET trainers of trainers in Uganda.

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II. LITERATURE REVIEW

2.1 Theoretical Framework

This study was grounded in the Experiential Learning Theory (ELT).

2.1.1 Experiental Learning Theory (ELT)

The theory was developed by David Kolb in 1984, building on earlier works by educational theorists such as John Dewey, Kurt Lewin, and Jean Piaget, who emphasized learning as an active, socially grounded, and iterative process (Kolb & Kolb, 2009). ELT assumes that effective learning occurs when individuals engage in a four-stage cyclical process: Concrete Experience, where the leaner actively participates in a new task or situation, such as attending a CPD workshop, testing a new teaching method, or using a new digital tool. Reflective Observation, in which the learner looks back on the experience, assessing what happened, what worked, and what did not, often through journaling, peer discussions, or self-evaluation. Abstract Conceptualization, where insights from reflection are used to develop new understandings or revise existing frameworks; this might involve linking practice to theory or identifying principles that can guide future instruction. Active Experimentation, where the learner applies the latest ideas or strategies in practice, setting the stage for fresh experiences and further learning (Kolb & Kolb, 2009).

Experiential Learning Theory (ELT) has been widely applied across diverse fields including education, health sciences, engineering, and vocational studies, demonstrating its versatility in guiding both formal and informal learning processes. In teacher education, ELT has been used to design reflective practicum experiences where student-teachers alternate between classroom teaching, reflective journaling, and feedback sessions to refine their pedagogical skills (Nuraeni & Heryatun, 2021). In the health sciences, particularly nursing and medical training, ELT underpins simulation-based learning, where learners engage in hands-on clinical scenarios followed by debriefs and theoretical integration to strengthen clinical judgment and decision-making (Uppor et al., 2024). The theory has also been pivotal in engineering and technical training, where students work on design projects or field-based assignments, then reflect and reapply insights to improve their processes.

Despite its wide applicability, Experiential Learning Theory (ELT) has faced several criticisms. One major critique is its overly linear and cyclical structure, which some scholars argue does not reflect the unpredictable, non-sequential nature of real-world learning, especially in complex institutional setting (Kayes, 2002). Others argue that ELT overemphasizes the individual learner while neglecting the social, cultural and political context of learning, downplays the role of emotion and power dynamics essential to adult development, and lacks robust empirical tools for effectively measuring and applying its learning cycle stages (Bergsteiner et al., 2010). To address these limitations, the current study integrated ELT with a strong focus on contextual factors, particularly the institutional environment in which CPD occurs, and included qualitative insights that captured the lived experiences, constraints, and institutional cultures shaping trainer learning. By doing so, the study offered a more grounded application of ELT that reflected the realities of TVET master trainer development in Uganda.

Experiential Learning Theory, was chosen in for this study because the model is applicable in the context of TVET, where professional growth relies not only on content knowledge but on continuous application, adaptation, and innovation in real-world instructional environments. The theory's four-stage cycle closely aligns with the aims of CPD, which is the study's core independent variable. Each of the CPD strategies under investigation, such as current practices, training needs identification, and innovative approaches, directly engages trainers in experiential learning processes that ultimately shape their competencies in areas like instructional planning, participatory teaching methods, ICT use, and assessment. ELT was used in this study to interpret how these CPD interventions translate into measurable changes in trainer behaviour and skill application, particularly within the context of institutional environments that may either support or constrain the experiential cycle. By anchoring the conceptual framework in ELT, the study explored not just whether CPD influences trainer competencies, but how the process of learning through experience unfolds in practice and what institutional factors enhance or inhibit that learning.

2.2 Empirical Review

A review of Training Competencies for Malaysian Mechanical Industries' Continuing Professional Development (CPD) was conducted in Malaysia to produce highly skilled workers who will enhance organizational productivity in high-income countries and improve customer satisfaction (Wan Ngah & Buniyamin, 2021). The researchers noted that there was a change in Malaysia, which made them come up with a review. For that matter, it is possible that after the review, the situation improved. By focusing on the review in Malaysia, it is important that developing countries, including Uganda, may also need such a review. Gaps: the TVET system in Malaysia is different from that in Uganda, and trainees who joined are also different.

In a similar vein, the Queensland Academy of Teachers in Australia created the Continuing Professional Development (CPD) Policy and Framework to outline the requirements for registration renewal and recognize the

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significance of teacher participation in CPD (Aryee et al., 2024). Fortunately, similar arrangements are underway in Uganda. The TVET subsector developed the TVET policy in 2019 and the TVET Act 2025, which advocates for compulsory and mandatory CPDs for TVET trainers to enable them to keep updated with ongoing advancements in technology and the renewal of their practicing licenses. From the perspective of Uganda, the major intention was to create employer-led TVET. At the same time, the arrangement is intended to strengthen public-private partnerships and address the quality of TVET trainers. The gap between this study and Aryee et al. (2024) study is specific to the renewal of registration, and for Uganda, it is One of the goals of research carried out in South Africa was to evaluate the roles and responsibilities of important stakeholders. The findings demonstrate that explicit and strict adherence to the duties and responsibilities of all relevant parties is necessary for CPD to continue as a viable and essential component of local teacher development. Depending on the current educational frameworks in each nation, the actors engaged may vary. The researcher wholeheartedly concurs that including stakeholders in the creation of his CPD for VET trainers allows for the contribution of numerous ideas and the insight of creative individuals.

A study entitled "Current Status of TVET Teachers' Continuous Professional Development Practice in Case of Addis Ababa, Ethiopia" was carried out by Negash et al. (2024). The study finding points out that TVET instructors benefit from various forms of continual professional development. Most teachers at TVET College and Institute have ongoing professional development opportunities. The study found that various forms of CPD are necessary to improve student results. TVET teachers cannot effectively support and motivate students if their professional growth is not documented. This study suggests that CPD programs should be tailored to meet the requirements of instructors and increase student results over time. The results of the TVET College and Federal TVET Institute questionnaires, as well as teachers' responses, suggest that need-based CPD activities are beneficial for improving teachers' practice and student outcomes in Ethiopia (Negash et al., 2024).

According to Njenga (2024a), the research indicates that certain VET teachers in Kenya may not possess the necessary teaching abilities and knowledge, which might account for some of the ongoing issues faced by TVET teachers. As a result, Kenya's VET instructors have a critical need for ongoing professional development (CPD). According to the report, a dearth of supporting legislation contributes to Kenya's irregular ongoing professional development (CPD) for VET teachers. Several important Kenyan education policy papers have been analysed, and the results show that the policies intended to direct teachers' ongoing professional growth are unclear. According to the multi-stream paradigm, policymakers' lack of specific and practical policy alternatives to advance and maintain the CPD is the root cause of the policy gap. A variety of policy choices are thus suggested by a survey of the research on effective professional development. Among these are policy frameworks that are supportive rather than prescriptive and that make it possible for teachers to make creative decisions about what and how they learn. Furthermore, combining professional learning with professional advancement is suggested. To help with the creation of a workable policy framework, an empirical analysis of the present learning practices of VET instructors and the viability of suggested remedies is required.

According to research by Papier (2016), student performance and satisfaction increased by 70% at TVET colleges that adopted complete CPD programs. According to research undertaken by the National Board for Technical Education (NBTE) in Nigeria, CPD programs that incorporated interactions with business partners were particularly useful. This cooperation made it simpler to align industry demands with TVET courses, ensuring that the education was current and appropriate. The survey also showed that, at 65% of the schools that used CPD programs, graduates' employability increased dramatically, highlighting the direct effect of CPD on student outcomes.

Another significant piece of research that looked at the challenges and successes of CPD in TVET schools in Nigeria was carried out by Philogene et al. (2024). The poll found that although 60% of TVET teachers saw the value of CPD programs, only 40% of them routinely had access to them due to practical and financial constraints. Despite the challenges, the survey discovered that CPD participants reported a 50% increase in their confidence and effectiveness in delivering technical training. The researchers recommended increasing funding for CPD programs and establishing rules to ensure that all TVET instructors have access to ongoing professional development in order to overcome these challenges. The study also highlighted the need for government and private sector collaboration to create sustainable CPD programs that can adapt to the changing demands of the workforce.

III. METHODOLOGY

This study employed a convergent parallel mixed-methods design within a descriptive framework, which integrates quantitative and qualitative approaches to provide a comprehensive understanding of a research problem (Creswell & Plano Clark, 2018). This design enabled the systematic and simultaneous documentation of CPD practices, trainer competences, institutional strategies, and gaps. Quantitative data were collected via structured questionnaires, while qualitative insights were gathered through interviews and document analysis from TVET trainers, administrators,

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policymakers, and partners. The separate analysis and subsequent triangulation of both data types ensured a holistic and evidence-based understanding of Uganda's CPD landscape.

The study engaged a total of 189 participants strategically selected from Uganda's TVET sector, comprising 74 TVET lecturers and technicians, 18 institutional managers and principals, 44 officials from the Ministry of Education and Sports, 4 development partner managers, 27 trainees, and 5 industry representatives. This diverse sample ensured insights from all levels involved in the planning, delivery, and reception of Continuing Professional Development (CPD). The distribution of participants across these key stakeholder groups is summarized in the table below.

Table 1

Study Population, Sample Size, and Sample Techniques

Category	Population	Sample size	Sampling Techniques
MoES Officials	4	4	Purposive
Principals	3	3	Purposive
EDPs	4	4	Purposive
Industrial Partners	5	5	Purposive
Institutional Management Staff	15	15	Purposive
HTVET Staff	40	40	Purposive
TVET Trainees	27	27	Purposive
TVET Master Trainers	91	74	Stratified Random
Total	**189**	**172**	

Both probability and non-probability techniques were used. Purposive sampling targeted key informants such as Ministry of Education and Sports officials, principals, and development partners due to their expertise in CPD and policy implementation (Palinkas et al., 2015). Stratified random sampling was applied to trainers, dividing them into strata by institution and role (lecturers and technicians) to ensure representativeness across Jinja Vocational Training Institute, National Instructor's College-Abilonino, and Nakawa Training Vocational College (Etikan et al., 2016).

Four research instruments were employed: structured questionnaires, interview guides, focus group discussion guides, and document review guides (Creswell, 2014). The structured questionnaires captured quantitative data on CPD practices and trainer competences using Likert-scale items, while the qualitative guides elicited in-depth insights from officials, partners, staff, and trainees. To ensure validity, all instruments underwent rigorous expert review by academic supervisors, ethics committees, and a Ministry of Education and Sports (MoES) specialist. The questionnaire's construct validity was confirmed through a pilot study and Exploratory Factor Analysis, which showed all items had factor loadings above 0.5. Furthermore, the instrument demonstrated strong reliability, with all categories achieving Cronbach's Alpha values above 0.70, indicating high internal consistency. These tools are available as supplementary material.

Quantitative data from questionnaires were entered in Kobo Collect, cleaned in Excel, and analyzed in SPSS v27. Descriptive statistics (frequencies, means, percentages) summarized trainer responses, while inferential techniques such as correlations and regression tested relationships between CPD strategies and competences. The mediating role of instructor training institutions was examined using the PROCESS macro (Ott & Longnecker, 2010). Qualitative data from interviews, FGDs, and documents were transcribed, coded thematically in NVivo v15, and analyzed using both inductive and deductive approaches to capture patterns and contextual insights (Flick, 2013).

The research process was initiated with approval from the University of Eldoret's Postgraduate Research Committee. Ethical clearance was then obtained from the Gulu University Research Ethics Committee (GUREC) and a research permit was secured from the Uganda National Council for Science and Technology (UNCST). Official permission was granted by the Permanent Secretary of the Ministry of Education and Sports (MoES) to access the study sites. All participants provided informed consent, and data were anonymized and handled with strict confidentiality to ensure ethical integrity. The study observed ethical principles of informed consent, confidentiality, beneficence, and integrity (Kessio & Chang'ach, 2020).

IV. FINDINGS & DISCUSSION

4.1 Findings

The results for descriptive statistics on current CPD practices available for TVET Master trainers based on objective in summary present findings for both independent and dependent variables

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Table 2

Descriptive Statistics on Current CPD Practices available for TVET Master Trainers

S/N	Items	SD (%)	D (%)	NS (%)	A (%)	SA (%)	Mean	σ
1	My institution regularly organizes CPD programmes for trainers.	2 (2.7)	12 (16.2)	7 (9.5)	33 (44.6)	20 (27.0)	3.77	1.105
2	CPD programmes at my institution are relevant to my technical field.	4 (5.4)	2 (2.7)	4 (5.4)	38 (51.4)	26 (35.1)	4.08	1.001
3	CPD activities are accessible to all trainers regardless of their location.	10 (13.5)	17 (23.0)	0 (0)	40 (54.1)	7 (9.5)	3.23	1.288
4	I receive timely information about upcoming CPD opportunities.	6 (8.1)	12 (16.2)	9 (12.2)	37 (50.0)	10 (13.5)	3.45	1.160
5	CPD programmes include both theoretical and practical components.	2 (2.7)	15 (20.3)	2 (2.7)	40 (54.1)	15 (20.3)	3.69	1.097
6	CPD sessions are facilitated by knowledgeable and experienced instructors.	2 (2.7)	4 (5.4)	6 (8.1)	38 (51.4)	24 (32.4)	4.05	.935
7	The content of CPD programmes is regularly updated to reflect industry trends.	4 (5.4)	6 (8.1)	15 (20.3)	29 (39.2)	20 (27.0)	3.74	1.111
8	My institution encourages trainers to share knowledge gained from CPD with colleagues.	2 (2.7)	6 (8.1)	13 (17.6)	34 (45.9)	19 (25.7)	3.84	.993
9	Participation in CPD programmes is recognized and rewarded by my institution.	4 (5.4)	23 (31.1)	10 (13.5)	28 (37.8)	9 (12.2)	3.20	1.170

The results show that while CPD programmes are fairly regular and relevant, gaps remain in accessibility and consistency. Most respondents agreed (44.6%) or strongly agreed (27.0%) that their institutions organize CPD, with a mean of 3.77, though variability (SD=1.105) suggests uneven access. Relevance was rated highly, with 51.4% agreeing and 35.1% strongly agreeing, yielding a mean of 4.08 (SD=1.001), indicating strong alignment with trainers' technical fields. However, accessibility was less assured: 54.1% agreed and 9.5% strongly agreed, but 23.0% disagreed and 13.5% strongly disagreed, giving a mean of 3.23 (SD=1.288). These disparities suggest logistical, infrastructural, and resource-related barriers that limit equitable CPD participation.

The qualitative findings indicate that CPD implementation in Uganda's TVET institutions is generally well-received and relevant but remains inconsistent, fragmented, and often reliant on individual initiative or donor support. Programs tend to be sector-specific, with agriculture receiving more attention due to funding priorities, which limits opportunities for trainers in other technical fields. Accessibility is constrained by logistical challenges, funding limitations, and geographic disparities, though mechanisms such as centralized planning, budgeting, and institutional-level programs help mitigate these barriers. Trainers value CPD for addressing skills gaps, career advancement, and aligning with curriculum and technological updates. As one informant noted,

> *"Trainers view it positively, especially because it is a new initiative and demand-driven. Since the training is based on needs that cut across many staff members, the interest levels remain high. We have observed active participation, which is a clear indicator that the content resonates well with them"* ***(KI8, 2025).***

Another highlighted the role of inclusivity within institutions:

> *"At the National Instructors College Abilonino (NICA), CPD programs are designed to be inclusive and accessible to all trainers within the institution. The programs are structured to address the identified gaps across all instructors, ensuring no one is left behind within that context"* ***(FGD3, 2025).***

The findings show that trainers generally perceive CPD programmes positively, though some inconsistencies exist. About 63.5% of respondents felt they received timely information on CPD opportunities (mean=3.45, SD=1.160), suggesting communication gaps affect some trainers. Most agreed that CPD balances theory and practice (mean=3.69, SD=1.097), but variability indicates not all programmes achieve this integration, likely due to non-standardized curricula or resource constraints. Facilitators were rated highly, with 83.8% agreeing or strongly agreeing on their competence (mean=4.05, SD=0.935), indicating that sessions are generally well-delivered, though minor differences in facilitator quality persist across institutions.

The qualitative findings indicate that communication of CPD opportunities within institutions is informal and inconsistent, often relying on peer-to-peer updates through platforms like WhatsApp alongside occasional official notices, which limits trainers' ability to plan effectively. While many CPD programmes aim to integrate both theoretical and practical components, this balance is not consistently applied, with some workshops remaining largely theoretical. Facilitators are generally knowledgeable, often drawn from industry, ensuring relevance and practical insights; however, there is no standardized national process for selecting or training CPD facilitators, resulting in variability in quality. As one informant noted,

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"There are no clear, formal strategies for communicating CPD opportunities. Typically, instructors share information amongst themselves using platforms like WhatsApp" ***(KI3, 2025).***

Another highlighted the facilitator selection gap:

"There is no formal, procedural process at the national level for selecting or training CPD facilitators. Institutions independently identify subject matter experts to lead and facilitate CPD sessions" ***(KI3, 2025).***

The results indicate that while CPD content is generally updated to reflect industry trends (mean=3.74, SD=1.111) and knowledge sharing is encouraged (mean=3.84, SD=0.993), these practices are not uniform across institutions. About 66.9% of trainers agreed that content updates occur, yet variability suggests gaps, likely due to weak industry linkages and irregular curriculum reviews. Knowledge sharing is largely supported, with most respondents perceiving a positive culture for disseminating CPD insights. However, recognition and rewards for CPD participation are inconsistent (mean=3.20, SD=1.170), with nearly one-third of trainers feeling unrewarded, highlighting a lack of formal policies linking CPD to career progression or incentives, which may reduce motivation to engage in professional development.

The qualitative findings reveal that CPD content in Uganda's TVET institutions is developed through collaboration between institutions, the Ministry of Education, and industry stakeholders, which helps ensure relevance to industry demands and technological trends. Structured engagements such as workshops, supervision visits, and Public-Private Partnership meetings support curriculum alignment, yet integration of industry feedback remains inconsistent, and resource limitations hinder practical application. Trainers are expected to share knowledge through cascading or peer workshops, but heavy workloads and the absence of formal follow-up mechanisms reduce the effectiveness of this practice. Recognition and rewards for CPD participation are also limited, with certificates inconsistently issued and little linkage to promotions or career advancement. As one informant noted,

"Those trained at the national level are expected to cascade knowledge by training others, essentially serving as trainers-of-trainers. However, there is no follow-up mechanism to verify whether this cascading is happening or effective" ***(KI1, 2025).***

Another highlighted the lack of incentives:

"Currently, we have no recognitions or certificates linked to CPD participation. That is why I mentioned that we need some form of motivator. Since CPD is becoming a requirement for lecturers to renew their licenses, introducing certificates would be timely. It would not only motivate attendance but also serve as a quality assurance tool during license renewals" ***(KI8, 2025).***

The findings revealed mixed perceptions among trainers regarded whether CPD participation leads to meaningful recognition or career advancement. Whereas some trainers associated CPD with professional growth, most noted that formal incentives, such as promotions, salary increments, or workload adjustments were rarely tied to participation. This mirrors Chuprynko's (2020) finding that the absence of tangible rewards discourages consistent CPD engagement, especially when participation requires personal sacrifices. The inconsistency in issuing certificates, combined with their limited utility in promotion processes, reduces motivation and weakens the institutional value placed on CPD. Njenga (2024b) similarly reported that despite broad endorsement of CPD's value, systemic recognition mechanisms were lacking. These findings underscore the need for formalized reward systems that not only recognize CPD participation but also integrate it into career progression pathways, thereby reinforcing its role as a driver of professional excellence and institutional growth.

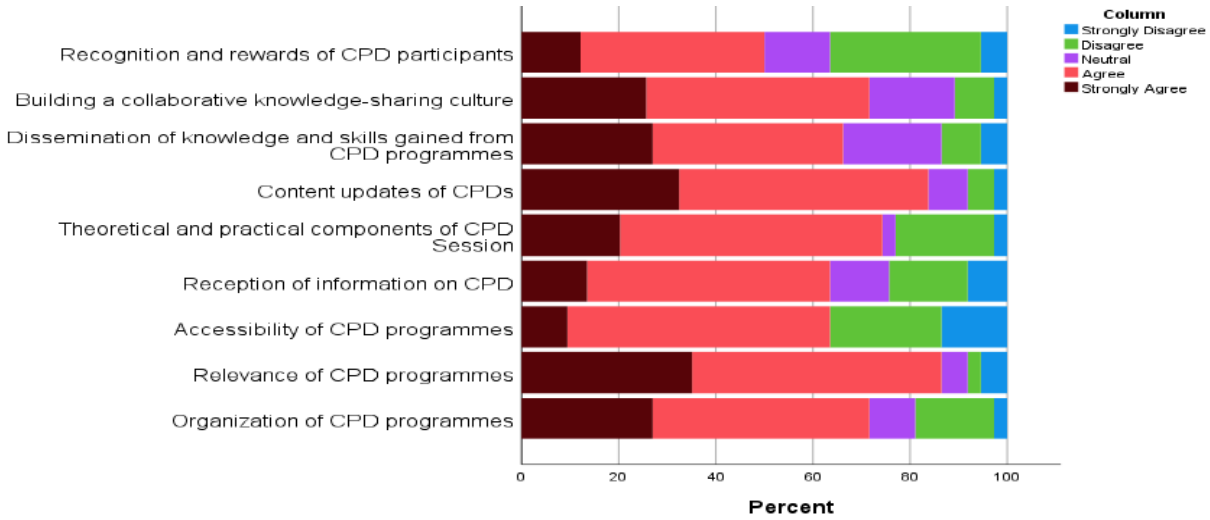

Figure 1

The current CPD Practices Available for TVET Master Trainers

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Table 3

Correlation Analysis between current CPD practices and TVET Trainer Competences

Correlations			
		Current CPD practices	TVET Trainer Competences
Current CPD practices	Pearson Correlation	1	.459**
	Sig. (2-tailed)		.000
	N	74	74
TVET Trainer Competences	Pearson Correlation	.459**	1
	Sig. (2-tailed)	.000	
	N	74	74

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Primary Data (2025)

The correlation analysis in table 3 revealed a moderate and statistically significant positive relationship between the current CPD practices implemented in instructor training institutions and the professional competences of TVET master trainers in Uganda. The Pearson correlation coefficient (r = 0.459) indicated that improvements in CPD practices are associated with higher levels of trainer competences. This relationship was statistically significant at the 0.01 level (2-tailed), with a p-value of 0.000, which was well below the conventional threshold of 0.05. Therefore, we accept the hypothesis, which posits that there was a significant relationship between current CPD practices and the professional competences of TVET master trainers in Uganda. This finding suggested that investing in and strengthening CPD practices within instructor training institutions could play a pivotal role in enhancing the skills and competences of trainers, ultimately improving the quality of TVET delivery in the country.

Table 4

Regression Analysis between current CPD practices and TVET Trainer Competences

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	3.110	.242		12.869	.000
Current CPD practices	.282	.064	.459	4.381	.000
a. Dependent Variable: TVET Trainer Competences					
R	R Square	Adjusted R Square	Std. Error	F Statistic	Sig.
.459[a]	.210	.200	.41987	19.195	.000[b]

Source: Primary data (2025)

The regression analysis results in Table 4 above indicated a statistically significant positive relationship between current CPD practices and the professional competences of TVET master trainers in Uganda. The R Square value of 0.210 showed that current CPD practices explain approximately 21% of the variance in trainers' professional competences. Whereas this is a modest proportion, it was meaningful in the education sector where multiple factors contribute to competences. The model's F-statistic of 19.195 and a p-value of 0.000 confirm that the model was statistically significant, meaning CPD practices reliably predict professional competences. The unstandardized coefficient (B = 0.282) suggested that for every one-unit increase in the quality or extent of CPD practices, the trainers' competences improve by 0.282 units. The standardized Beta coefficient (β = 0.459) further indicates a moderate predictive strength of CPD practices on competences. The t-value of 4.381 with a corresponding p-value of 0.000 confirms this relationship is highly significant.

These results pointed out to accept the hypothesis which states that there is a significant relationship between current CPD practices and the professional competences of TVET master trainers in Uganda. However, the R Square value also suggests that other factors, such as institutional support, trainers' motivation, availability of resources, policy environment, and engagement with industry, likely account for the remained 79% variance in trainer competences. Therefore, whereas CPD practices are essential, a more holistic approach integrating these other factors would further strengthen trainers' professional growth and effectiveness.

4.2 Discussion

The study reveals that CPD implementation for TVET trainers in Uganda is inconsistent and fragmented, reflecting a system sustained more by donor projects and individual initiative than by national coordination. This lack of a coherent framework limits equity and sustainability, a challenge also observed in Rwanda where only 31.1% of TVET teachers had formal training (Philogene et al., 2024) and in Ethiopia where less than 40% participated in CPD or

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mentorship (Negash et al., 2024). Although CPD programmes are generally relevant and align with trainers' technical areas, their quality and accessibility fluctuate depending on funding, location, and institutional capacity. This explains why CPD accounts for only 21% of the variance in trainer performance, with the remaining 79% likely influenced by factors such as institutional culture, intrinsic motivation, leadership, and resource availability. These findings reinforce Njenga's (2024a, 2024b) observations that cost, time constraints, and weak employer support undermine participation, while Chuprynko (2020) highlights systemic barriers that mirror Uganda's experience. This points to a fragmented yet promising CPD landscape, with pockets of effectiveness that could be strengthened through a national CPD policy, sustainable funding, and stronger institutional support to make professional development more equitable, continuous, and performance-driven.

The study reveals that communication, content balance, and facilitation quality within Uganda's CPD system remain inconsistent, reflecting broader structural weaknesses rather than isolated issues. Information flow is largely ad hoc, relying on informal platforms such as WhatsApp and circulars, similar to patterns seen in Kenya (Njenga, 2024b) and Rwanda (Philogene et al., 2024), which limits equitable participation and coordinated planning. The design of CPD programmes also shows an uneven integration of theory and practice, echoing Hasanah et al. (2025) and Njenga (2022a), who stressed that overly theoretical instruction weakens practical skill transfer in vocational training. Facilitator quality, though generally strong where industry experts are engaged, remains variable due to the absence of clear national standards for recruitment and accreditation, as noted by Negash et al. (2024). Collectively, these findings depict a system with promising elements but lacking coherence. Strengthening communication structures, embedding hands-on learning, and instituting national facilitator standards could transform CPD into a consistent and practice-driven mechanism for professional growth across Uganda's TVET institutions.

The findings reveal that Uganda's CPD system for TVET trainers remains fragmented, with limited coordination, weak institutionalization, and minimal incentive structures. Although CPD content is occasionally updated to reflect industry needs, the process lacks consistency and structured collaboration between government and industry, mirroring Diao et al. (2024), who identified similar weaknesses in aligning TVET frameworks with technological change, and Chuprynko (2020), who linked irregular curriculum reviews to financial and logistical barriers. Peer learning after CPD is encouraged but largely informal, depending on individual initiative rather than institutional support. This aligns with Njenga (2024a), who noted underuse of co-teaching and mentoring, and Negash et al. (2024), who found that most Ethiopian teachers lacked structured mentoring systems. Trainers also reported uncertainty about CPD's role in career advancement, as participation rarely translates into promotions or financial recognition, consistent with Chuprynko (2020) and Njenga (2024b), who observed weak reward linkages across similar contexts. Together, these results depict a CPD landscape marked by sporadic relevance, informal follow-up, and weak motivation. Establishing annual content review cycles, formalized peer-learning mechanisms, and incentive-based recognition could strengthen continuity, collaboration, and performance orientation in Uganda's CPD implementation.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

CPD implementation for TVET trainers in Uganda is marked by inconsistency and fragmentation. Although programs are regularly organized, their delivery often depends on donor initiatives or individual efforts, which creates uneven access and varied quality across institutions. This patchy landscape underscores the urgent need for a cohesive national policy framework that can harmonize CPD activities, promote fairness in participation, and better align with broader institutional and national skills development objectives.

Moreover, the current CPD landscape is heavily skewed toward agriculture, largely due to donor funding preferences. This sector-specific focus leaves other technical fields under-resourced and limits the inclusivity of professional development opportunities. To address this imbalance, a more comprehensive approach is necessary; one that involves diversified funding sources and careful needs assessments to ensure all vocational disciplines receive adequate support and attention.

Accessibility remains a significant barrier, particularly for trainers in remote or underserved areas. Challenges such as logistical hurdles, centralized training venues, and limited financial resources disproportionately affect these regions, restricting equitable participation. Embracing blended learning models and decentralizing training delivery could offer practical solutions to expand reach and inclusivity.

Communication around CPD opportunities is currently inefficient and fragmented. The reliance on informal methods like WhatsApp, while helpful in some contexts, fails to guarantee timely and equitable dissemination of information. Institutions must invest in structured and reliable communication channels, such as dedicated digital platforms, to enhance transparency and enable better planning for both trainers and management.

Regarding CPD content, there is a general effort to balance theoretical knowledge with practical application, but this is unevenly realized. Resource limitations and the absence of a standardized curriculum contribute to variability,

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reducing the overall effectiveness of training. Introducing mandatory practical modules and reinforcing partnerships with industry would improve the relevance and applicability of CPD programs.

Facilitators involved in CPD are often well-qualified and drawn from industry, which adds value and relevance to training sessions. However, the process for selecting these facilitators lacks standardization, resulting in inconsistent quality across programs. Developing clear criteria for facilitator qualifications and experience is critical to ensuring uniform training excellence.

The updating of CPD content is irregular, despite efforts to collaborate with industry stakeholders. Weak institutional linkages and outdated resources hinder timely revisions; risking disconnect between training and current industry trends. Regular content reviews, sustained engagement with industry, and investment in modern teaching tools are vital to maintaining the currency and usefulness of CPD offerings.

Sharing of knowledge gained through CPD remains largely informal and is not yet institutionally embedded. The absence of formal mechanisms, such as peer-learning frameworks or accountability structures, limits the effective spread of insights and best practices. Creating structured platforms for knowledge exchange and providing incentives would help build a stronger culture of professional collaboration.

Recognition for CPD participation was weak and inconsistent, which undermines motivation among trainers. Without formal reward systems such as certificates linked to career advancement or salary increases engagement in professional development can wane. Institutionalizing recognition mechanisms would not only incentivize participation but also align CPD more closely with trainers' career trajectories and aspirations.

5.2 Recommendations

Ministry of Education and Sports should develop CPD policy, framework and guidelines for TVET instructor training institutions. A standardized policy, framework and guidelines should guide content relevance, delivery methods and access, ensuring equitable, consistent, and nationally coordinated CPD provision. This policy, framework and guidelines must ensure equitable access across all institutions and regions, whereas also integrating emerging skills such as digital literacy and green technologies.

Industry partnerships should be formalized through developing Industry training attachment policy, framework and guidelines to strengthen collaboration between TVET institutions and industries. To guide the process of structured agreements that include joint curriculum reviews, trainer internships, and industry-led workshops. Industry representatives should actively participate in CPD from skills sector expert, TVET Council, Assessment Board Councils to ensure training aligns with labour market needs.

CPD recognition systems should link participation directly to promotions, salary adjustments, and professional licensing. The Ministry of Public Service, Ministry of Education and Sports, TVET council should revise appraisal mechanisms and scheme of service to reward trainers who apply and successfully attain CPD learnings. Government and development partners should invest in digital CPD infrastructure, including low-bandwidth e-learning platforms, subsidized connectivity, and ICT training for all trainers. Institutions must also equip training spaces with computers and internet to support blended learning.

Formal mentorship programmes should be embedded in institutions, pairing junior trainers with experienced colleagues under structured guidelines. Progress should be tracked through set objectives, mentorship reports, and inclusion in trainer evaluations. Hands-on training opportunities should be strengthened by expanding access to industry-standard tools, modern equipment, and real-world project engagements. Partnerships with employers should be enhanced to facilitate trainer attachments, industry workshops, and joint exposure visits with students through structured collaborations between TVET institutions and industry partners. Continuous industrial training should be institutionalized for in-service trainees to bridge existing skills gaps and provide practical, hands-on experience aligned with current industry practices. Institutions must also equip training spaces with computers and internet to support blended learning through their planning, budgeting and implementation. TVET trainer of trainers' institution should promote institutional based CPD

TVET trainers should participate in professional learning communities of practice and continuous industrial training attachments to enable skill enhancement and development. There is need to conduct action research to inform innovations in the National Instructors College Abilonino. These practices enhance the competences of TVET trainers in research.

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REFERENCES

Agole, P., Kerre, B., Okaka, W. T., & Ochieng, R. (2022). Confronting the challenges of university technical vocational education and training in Uganda. *African Journal of Education, Science and Technology, 7*(2), 215–223.

Aryee, G. F. B., Amoadu, M., Obeng, P., Sarkwah, H. N., Malcalm, E., Abraham, S. A., ... & Ogaji, D. (2024). Effectiveness of eLearning programme for capacity building of healthcare professionals: A systematic review. *Human Resources for Health, 22*(1), 60.

Barigye, D. (2024). Technical vocational education and training in Uganda: Career guidance and practices. *African Journal of Career Development, 6*(1), 100.

Bergsteiner, H., Avery, G. C., & Neumann, R. (2010). Kolb's experiential learning model: Critique from a modelling perspective. *Studies in Continuing Education, 32*(1), 29–46.

Chuprynko, A. (2020). Continuing professional development for vocational teachers and principals in Turkey 2018. *European Training.* https://www.etf.europa.eu/sites/default/files/2020-10/turkey_cpd_survey_2018.pdf

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage.

Diao, J., Han, X., Zhou, Q., & Wang, Y. (2023). Professional competences in TVET: Framework, indicators and assessment instrument. In *Handbook of technical and vocational teacher professional development in the digital age* (pp. 41–73). Springer Nature Singapore.

Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics, 5*(1), 1–4.

Flick, U. (Ed.). (2013). *The SAGE handbook of qualitative data analysis*. Sage.

Hasanah, D., Samsudi, S., Khafid, M., & Arbarini, M. (2025). Continuous professional learning as an innovation in vocational teacher performance improvement management. *Journal of Information Systems Engineering and Management, 10*(38s), 239–245.

Hlatjwako, S. W., Makwara, T., Sibanda, L., & Ndlovu, E. N. (2025). Professional development of lecturers at South African TVET colleges through coaching and mentoring. *Social Sciences and Education Research Review, 12*(1), 427–436.

Kayes, D. C. (2002). Experiential learning and its critics: Preserving the role of experience in management learning and education. *Academy of Management Learning & Education*, *1*(2), 137-149.

Kessio, D. K., & Chang'ach, J. K. (2020). Ethical considerations in undertaking research in higher education: East African context. *US-China Education Review, 10*(3), 135–140.

Kim, J. (2021). An analysis of Uganda's vocational education: Assessing human capital and human development approaches. *Issues in Educational Research, 31*(2), 556–573.

Kintu, D., Kitainge, K., & Ferej, A. (2019). Employers' perceptions about the employability of technical, vocational education and training graduates in Uganda. *Advances in Research, 18*(2), 1–17. https://doi.org/10.9734/air/2019/v18i230087

Kolb, A. Y., & Kolb, D. A. (2009). Experiential learning theory: A dynamic, holistic approach to management learning, education, and development. In S. J. Armstrong & C. V. Fukami (Eds.), *The SAGE handbook of management learning, education and development* (pp. 42–68). Sage. https://doi.org/10.4135/9780857021038.n3

Ministry of Education and Sports. (2016). *A harmonized framework for initial teacher training in Uganda*. UNESCO. https://www.education.go.ug/wp-content/uploads/2022/04/ITE-Framework.pdf

Mutebi, R., & Ferej, A. (2023). A review of TVET quality assurance practice in Uganda. *East African Journal of Interdisciplinary Studies, 6*(1), 182–196. https://doi.org/10.37284/eajis.6.1.1327

Negash, B. A., Che, Y., & Mi, J. (2024). Current status of TVET teachers' continuous professional development practice in Addis Ababa, Ethiopia. *Open Access Library Journal, 11*(9), 1–11.

Niyomushobozi, A., & Kiarie, M. N. (2024). Trainers' continuous professional development and students' learning outcomes in TVET institutions. *International Journal of Advanced Research, 12*(10), 526–530.

Njenga, M. (2024a). Content and effectiveness of TVET teacher CPD in Kenya. *Hungarian Educational Research Journal, 14*(3), 261–278.

Njenga, M. (2024b). Continuing professional development of vocational teachers in Kenya: Challenges and coping strategies. *Journal of Adult and Continuing Education, 30*(2), 348–369.

Nuraeni, N., & Heryatun, Y. (2021). Reflective practice strategies of pre-service English teachers during teaching practicum to promote professional development. *Studies in English Language and Education, 8*(3), 1144–1157. https://doi.org/10.24815/siele.v8i3.20221

Okware, J. C., & Ngaka, W. (2017). Rationale and challenges of technical vocational education and training in Uganda. In *Technical education and vocational training in developing nations* (pp. 26–44). IGI Global.

Licensed Under Creative Commons Attribution (CC BY-NC)

Ott, R. L., & Longnecker, M. (2010). *An introduction to statistical methods and data analysis*. Cengage Learning Inc.

Papier, J. (2016). A comparative study of TVET in 5 African countries with a specific focus on TVET teacher education. *Vocational Education and Training in Sub-Saharan Africa, 41*.

Philogene, M., Zhiyuan, S., & Nyoni, P. (2024). Teacher professionalism development in TVET system: Preparedness, in-service trainings, and challenges. *Journal of Evaluation in Education (JEE), 5*(3), 107–117.

Uppor, W., Klunklin, A., Viseskul, N., & Skulphan, S. (2024). Effects of experiential learning simulation-based learning program on clinical judgment among obstetric nursing students. *Clinical Simulation in Nursing, 92*, 101553. https://doi.org/10.1016/j.ecns.2024.101553

Wan Ngah, W. A. J., & Buniyamin, N. (2021). The evaluation of TVET instructor's training needs analysis using curriculum development based on vocational ability structure in Malaysia. *Journal of Electrical and Electronic Systems Research (JEESR, 19)*, 185–192. https://doi.org/10.24191/jeesr.v19i1.025

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Towards optimizing outpatient waiting time through e-governance: Exploring digital registration barriers in first-level hospitals, Lusaka, Zambia

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ABSTRACT

The issue of long queues in outpatient departments in urban hospitals is a topical challenge given the context of health facilities operating in the sphere of the state that brings the issue of patient dissatisfaction, frustration and loss of confidence in the healthcare delivery system. Such a long waiting time does not only cause inconvenience to the patients but also exposes the healthcare staff to excessive work, thus overworking the service-delivering systems. Waiting time is a major indicator of the health system performance; in the event whereby the waiting time is longer than the acceptable mark, it may contribute to the incidence of adverse health outcomes and reduce adherence to the treatment process by the patients and the overall quality of care. The latter phenomenon, in its turn, requires the consideration of reducing the patient experience and improving the health service delivery. Queuing theory guided this research. This study employed a qualitative design, the target population being those in charge of hospital managerial and operational decisions. This research involved the purposive sampling of 12 healthcare managers to give information on barriers associated with digital registration in first-level hospitals. The selected first-level hospitals were Chilenje and Kanyama First Level Hospitals, based in Lusaka, Zambia. Collection of data was done using in-depth interviews, and analysis was done using themes that were produced during the study. This study has revealed that digital systems are associated with barriers which ultimately impact patient waiting time. According to healthcare providers, the constant system malfunctioning was a major disruption of the registration process, forcing them to revert to the manual methods. In conclusion, this research recommends modernising infrastructure to maximise capacity, integrating registration with other departments to maximise patient flow, and ensuring reliable, well-maintained systems. The study further suggests a thorough focus on comprehensive staff training, supporting patient digital literacy, promoting staff adoption through change management, and increasing administrative response.

Keywords: Digitization, Health Systems Management, Hospital Efficiency, Lusaka, Patient Satisfaction, Waiting Time, Zambia

I. INTRODUCTION

The long waiting time in outpatients is a chronic issue in most of the public health institutions in the majority of the low and middle-income countries, including Zambia. Such a delay is detrimental to patient satisfaction, quality of care and causes further straining to the already overstretched health system resources (Hamoonga et al., 2024). Its infrastructure is inefficient because the number of patients is increasing, and the issues of staffing shortage in medical care institutions cannot be merely compared to the inefficiency of operations but also introduce an insurmountable difficulty to the process of providing healthcare in a just and timely manner. The effectiveness of the outpatient services is an essential sign of the receptiveness of the health system, and in its turn, the long waits ruin patient confidence and illusiveness of the shift to the universal health coverage(Alodan et al., 2020; Naiker, 2017).

In the case of Zambia, the first and the most common point of interactions between the society and the formal healthcare structure is outpatient departments (OPDs). However, the inflows of patients that are not manageable, lack of space to consult with, and lack of coordination of patient flow usually overwhelm these departments.(Bilandžić, 2022). Although it is not a secret that long waiting times are the order of the day, there is scanty data on Zambia regarding the factual nature of the delay experience, the perceptions of the delays by the patients and the overall impact of the factors on the delay systematically and demographically. As a fact, the waiting times depend on a vast number of factors predetermined and among the factors, there are: socio-demographic factors, arrival distributions, appointment scheduling habits, staffing rates and facility equipment. Nevertheless, these outcomes should be highly contextual and thus the need to have locally relevant research so that to arrive at the evidence that can be employed to formulate specific and sustainable interventions.

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1.1 Statement of the Problem

Although the first-level hospitals in Lusaka District have introduced digital registration systems to provide improved efficiency and shorter waiting time by the patients, there are still many operational barriers that interfere with the efficiency of the system (Villegas et al., 2021). The common system crashes, insufficient training of staff, ineffective integration of the system, lack of digital literacy among the patients, and unreliable internet and power connectivity have all contributed to sabotaging the desired gains of digitalization(Alodan et al., 2020; Bolton Moore et al., 2022). Such issues do not only increase the wait of the patient, but also cause disruption in the workflow, frustrations by the staff and low satisfaction by the patients. It is important to understand the causes of these barriers through the lens of hospital managers to establish the specific intervention that may be used to streamline the process of digital registration and enhance the delivery of services in the context of a public health facility.

1.2 Research Objective

To understand the challenges to successful digital registration and their impact on outpatient waiting time as experienced by first-level hospital managers in Lusaka, Zambia.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Queuing Theory

Queueing theory is a mathematical framework for analysing waiting lines and service systems, with emphasis on factors such as arrival rates, service rates, and the number of service channels (Biya *et al*. 2023). In the context of outpatient services, it clarifies how patient flow, staff availability, and service capacity interact to cause delays. Using queueing theory, healthcare management may forecast bottlenecks, optimise personnel, and minimise patient wait times. Outpatient waiting time studies have used this theory to model patient arrivals and service processes, demonstrating that inefficient resource allocation and uneven patient arrivals are major contributors to prolonged waiting, thus providing a basis for interventions to streamline service delivery.

2.2 Empirical Review

Waiting time is a period of time within which a patient has to wait in a healthcare facility before he or she is attended to in terms of seeking consultation or treatment (Hamoonga et al., 2024). Waiting time can be disaggregated into the phases of the following ones: registration, triage, consultation, laboratory, pharmacy, and discharge. Researchers distinguish between actual waiting time that can be objectively defined and perceived waiting time that may be considered subjective and experienced by the patients and has a strong impact on satisfaction It is a fact that the perceived wait time can be more powerful to create satisfaction than experienced delays since the psychological aspects like uncertainty, anxiety, communication among others create dissatisfaction (Sialubanje et al., 2023).

The concept of patient satisfaction is multi-dimensional, as it assumes the accessibility, the timeliness, the contact with interpersonal relations and the perception of quality (Rapoport et al., 2023). The fact that there exists a negative correlation between long waiting time and satisfaction is high (Tanabe et al., 2023). Beck et al. (2021) report that more than 60 percent of patients in Ghana stated that they were not happy with wait time more than two hours. On the same note, other studies affirmed the same results claiming that the wait time was one of the strongest predictors of poor outpatient care ratings (Abeni et al., 2021).

The high-income setting is also not satisfactory (long waits) but the average wait is much less (15-45 minutes). In this respect, indicatively, defined the relationship between the smallest shifts in waiting times in the United States and the reduction in the rates of patient satisfaction. These results indicate that the waiting time has a universal effect on the quality perceptions in terms of healthcare but in the resources constrained environments, it has amplified effects.

The way in which people identify their health needs, evaluate the available options of care, and choose whether or where to obtain care is referred to as healthcare seeking behaviour (Biya et al., 2022). The Adams Behavioural Model holds that predisposing, enabling and need factors determines utilisation of health services. Waiting time is dependent as enabling factor in addition to being a system level determination that significantly impacts the patient decision to use or not use services.

Research carried out in sub-Saharan Africa suggests that excessive waiting time is a barrier to on-time access to care, and patients who undergo this treatment opt to find other ways. Moshabela et al. have found that there were long lines of waiting time in South African public facilities, which led to patients shunning out of the public facilities and instead turning to pharmacies and traditional healers. On the same note, Sialubanje et al. (2023) established that women in Zambia had to choose traditional birth attendants over the formal health providers due to the long waiting times. These findings prove that waiting times are not only a parameter which changes the level of satisfaction but a paradigm of healthcare consumption.

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The systemic factors that contribute to long waiting time are shortage of staff, which is a widespread problem of low- and middle-income countries and also lack of adaptation to digital registration (Hall et al., 2022). The healthcare to population ratio in Zambia is significantly lower than the recommendations of WHO, and this aspect restricts clinicians in their ability to serve a large population (Schmidt et al., 2023). Others include poor planning of patient flow, digital faults, optimal triage, and a poor referral system (Musonda et al., 2021). Moreover, due to inadequate technology, the lack of the appointment booking system and electronic medical record, outpatient departments are overcrowded (Beck et al., 2021).

Comparative research brings out operational innovations. The use of appointment systems and the electronic queue management of waiting times in Tanzania and Uganda also reduced the waiting time (Parast et al., 2022). The described interventions demonstrate that even in the settings of limited resources, the operational performance can be improved with small systematic shifts.

III. METHODOLOGY

3.1 Study Design

The study was a qualitative descriptive design which aimed at investigating challenges health care providers face when using the digital system and how it affects outpatient waiting time.

3.2 Study Setting

The research was conducted in Kanyama First Level Hospital and Chilenje First Level Hospital in Lusaka, Zambia. Kanyama Hospital is in a low-income informal settlement where the population density is high, which is marked by large numbers of patients and limited resources. Chilenje Hospital has more socio-economically dispersed population, and it has the same problems. These institutions were selected as case study sites to represent the general systemic and functional constraints present in the Zambian tertiary facilities of the Zambian public healthcare.

3.3 Population and Sampling

The study focussed on healthcare providers and administrators, those in charge of day to day operation of the hospital and present at a time of study. The sample of the participants was selected as purposive and included those that were able to provide elaborative and informative descriptions of outpatient waiting times. The choice of the sample was determined through the accomplishment of data saturation.

3.4 Data Collection

Data was collected using in-depth interviews, consent was gotten to record participants during the discussion and field note were used too.

3.5 Information Processing and Processing.

It is essential to state that, the transcripts of the qualitative data were transcribed word-to-word and anonymised and placed in password-protected databases. Thematic analysis was applied as per the six steps laid out by Braun and Clarke and it was applied in the identification, coding, and categorization of patterns and common themes. The coding was repeated and cross validation was conducted between the members of the research team to enhance the reliability.

3.6 Ethical Considerations

Ethical approval was given by the University of Zambia Biomedical Research Ethics Committee (UNZABREC) and local authorities (Lusaka District and Provincial Health Offices and National Health Research Authority). There was an informed consent of the pparticipants, and there was also guaranteed voluntary participation. All the details were kept secret by making sure that the use of study codes and any other audio recordings and transcripts were stored in a safe place.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Social Demographic Characteristics

This section describes the sociodemographic characteristics of the health care managers who took part in the study. Understanding these features helps to contextualise the data and comprehend differences in responses to outpatient waiting times and hospital management strategies. The data collected includes respondents' professional designations, which represent their roles, responsibilities, and possible impact on service delivery. Table 1 summarises the distribution of responders across various managerial roles in hospitals.

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Table 1

Socio-Demographic Characteristics of Health Care Managers

Designation	Frequency	Percent
Head of Clinical Care	1	8.3
Principal Clinical Officer	2	16.7
Nursing Officer	2	16.7
OPD Nurse In-Charge	2	16.7
Hospital Administrator	2	16.7
Planner	2	16.7
Quality Assurance Officer	1	8.3
Total	**12**	**100%**

The study comprised 12 healthcare managers, whose socio-demographic characteristics are summarised in Table 1. The respondents held roles such as Principal Clinical Officer, Nursing Officer, OPD Nurse In-Charge, Hospital Administrator, and Planner, accounting for 16.7% of the sample. The Head of Clinical Care and the Quality Assurance Officer each represented 8.3% of the participants. This distribution shows a varied range of managerial jobs within healthcare institutions, including both clinical leadership and administrative control. The inclusion of these diverse positions gave a full view of operational issues, and solutions for outpatient treatment delivery and wait time management.

4.1.2 Thematic Analysis

Theme 1: System Crashes and Technical Faults. The study found that frequent system outages and technical issues had a major influence on the registration process, resulting in longer patient wait times. These technological disruptions frequently disturbed the normal flow of patient data submission and verification, resulting in congestion at registration locations. As a result, employees were frequently compelled to use manual techniques, which not only delayed the process but also produced inconsistencies and inaccuracies in patient data. This back-and-forth between technological and manual methods caused confusion among personnel and patients, worsening delays and decreasing overall service efficiency.

> *"The system is usually down in the morning and we are forced to register patients manually. This clearly slow down all these things." (P02)*
>
> *"Sometimes the digital system malfunctions and we will lose patient information hence patients will have to wait as we edit the records." (P09)*
>
> *"We struggle to fully transition from paper-based to SmartCare electronic records due to lack of computers, unreliable power supply, inconsistent internet, and insufficient funds for maintaining hardware and software. These issues often cause system breakdowns and force staff to revert to manual processe" (P04)*

Theme 2: Lack of Adequate Staff Training. Healthcare Managers claimed that inadequate training on the digital registration system hampered its efficient usage. Many employees battled with system navigation, frequently unclear of how to access various modules or execute common duties quickly. Furthermore, numerous data input mistakes occurred as a result of unfamiliarity with the system's interface, necessitating more time for repairs and verification. Small technological difficulties, such as system freezes or error warnings, exacerbated the situation since staff lacked the confidence or abilities to fix them independently. Collectively, these difficulties slowed patient processing, increased wait times, and occasionally prompted staff to resort to manual procedures, undercutting the digital system's expected productivity improvements. Ratio systems can perform properly and help to optimise patient flow.

> *"There is very little training that we were offered hence many of us do not feel comfortable with the system. This impacts on the speed of patient registration." (P07)*
>
> *"New employees are prone to mistakes in the system, which are time-consuming to resolve, contributing to the waiting of patients." (P11)*

Theme 3: Low System Capacity to large volumes of patients. According to participants, the computerised registration system frequently failed to effectively manage the large volume of patient registrations during peak hours. The system would slow down or stop responding when several patients tried to register at once during busy times, causing bottlenecks at the registration locations. Overall waiting times increased as a result of the visible lines that formed for both staff members trying to process the inputs and patients waiting. In addition to frustrating patients, the system's incapacity to grow with patient demand put extra strain on medical staff, who had to deal with both the system's technological constraints and the expanding lines.

> *"On hectic mornings, the system becomes slow and patients have to be patient enough to wait as they await to be attended to." (P12)*

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"Sometimes the system is unable to accommodate large numbers at a time so we have to make up lists manually to keep pace with this and this nullifies the point." (P01)

Theme 4: Lack of Integration with other Hospital Systems. The participants indicated that the registration system was not completely connected with other departments in the hospital and this has caused repetitions of data entry and slowing of patient traffic. This disconnectivity had the effect of adding to the total outpatient waiting time. Respondents noted that the registration system was not completely connected with other departments within the hospital, resulting in considerable bottlenecks in patient processing. Because the system could not interact with the laboratory, pharmacy, billing, and clinical records departments, employees were sometimes needed to enter the same patient information numerous times across various units. This repetition not only raised the likelihood of data inconsistencies and mistakes, but it also hindered patient movement through the hospital because each department had to process information individually rather than relying on a centralised system. The lack of communication between departments exacerbated patient delays, resulting in greater total outpatient wait times.

"Regarding the registration system, I was told that it does not send any information to the pharmacy and lab systems, which means that patient information must be entered into the pharmacy and lab systems manually." (P01)

"Poor integration is seen to make patients wait longer to have the test results or medications even after the patients are registered digitally." (P08)

Theme 5: Issues of Power and Connections. Participants reported that any disruption of digital registration due to intermittent power failures and unreliable internet connections resulted in a shift to paper-based systems, which further increased wait times. Providers stated that occasional power outages and inconsistent internet connections disrupted the digital registration system, affecting patient flow significantly. During such outages, employees were compelled to temporarily forsake the computerised system and return to paper-based registration procedures, which are intrinsically slower and more prone to mistakes. This abrupt change not only hindered the registration process, but also caused confusion among staff and patients, since manual records had to be reconciled with digital data once the system was restored. Waiting times were extended further due to the additional processes necessary to preserve continuity and accuracy in patient information, especially during busy hours.

"Once the power goes off the system will not work anymore, and patients are obliged to wait until we will find other methods to get them registered." (P04)

" The slow internet connection frequently results in the delays in records of patients saved, which slows the whole outpatient procedure." (P11)

Theme 6: Digital Registration-related Problems with patients. According to healthcare managers several patients encountered difficulties with registering online for National Health Insurance Scheme with the National Health Insurance Management Authority (NHIMA), this is to insufficient digital literacy, which delays the procedure and resulting in large lines especially for people accessing NHIMA services for the first time. Many patients were unfamiliar with fundamental digital self-services such as using the National Health Insurance Management Authority (NHIMA) web site and appropriately inputting personal information. This lack of knowledge resulted in several mistakes that required rectification or further help from personnel, significantly delaying the registration process. As a result of these digital registration issues, waiting times increase intensely, particularly during peak hours. Providers emphasised that personnel have to redirect their focus away from other vital jobs to help patients who are having trouble with self-service online registration, which increased their workload and stress levels.

"The reason is that some patients do not know how to use the NHIMA registration portal, and we end up wasting more time attending to the patient, which influences the overall waiting time." (P07) "

"Older patients usually require the help of other people, and the staff is not enough, which makes everyone wait." (P06)

Theme 7: Poor system maintenance and updates. The study found that the digital registration system was inadequately maintained, owing mostly to the usage of old software that was not consistently upgraded and old gadgets. The system had a poor processing speed, making it difficult for personnel to register patients effectively, especially during peak hours. Furthermore, the system faced regular outages and technical issues, which disrupted the registration process and required staff to halt or utilise manual techniques. These disruptions not only extended patient wait times, but also increased staff workload and added to confusion when maintaining patient information. The absence of periodic maintenance, software upgrades, and technical support exacerbated these challenges, emphasising the vital need for modernised, well-supported digital infrastructure to enable dependable, efficient, and uninterrupted service delivery in outpatient departments.

"I personally think the system is not well maintained even the gadgets we use are not modern gadgets hence limited with functions, even when we request to purchase laptops, we are told the grant received is not sufficient." (P05)

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"Unless it gets regularly maintained, it will accumulate minor problems that will generate large delays in the registration." (P10)

Theme 8: Workflow Interruptions and Employee resistance. According to the participants, staffs had a noticeably unfavourable attitude towards utilising the digital registration system. Some workers were reluctant to embrace the technology, either because they were used to manual processes or because they thought the system was too complicated and challenging to use. The system was used inconsistently as a result of this opposition, with some employees avoiding specific features or disregarding established protocols. Because certain procedures were delayed or repeated needlessly, these utilisation disparities interfered with workflow and patient flow. Further undercutting the productivity improvements that the digital system was supposed to offer were mistakes in data input, improper handling of patient information, and longer wait times due to a lack of excitement for utilising it.

"Not all the colleagues register patients digitally hence the inconsistency, which leads to delays, in most cases new staff members find it difficult to adapt to digital system." (P05)

"Workflow is interrupted, this is because when one half of the staff goes on the digital system, the other half adheres to the manual system, this disrupts the workflow." (P08)

Theme 9: Insufficient Administrative Support and Feedback. Participants stated, that top administration from different levels in the health system was insufficiently helpful and receptive to the issues connected with the digital registration system as much of the efforts is directed towards other pressing issues. Staff claimed that when issues raised, ranging from system malfunctions to workflow bottlenecks, there was little managerial involvement to address or fix them in a timely way as management claim the issue is above them. Furthermore, the lack of formal feedback channels meant that staff had no systematic way to report problems, make changes, or seek advice on best practices. This lack of communication and reactivity limited the system's continual improvement, diminishing its efficacy at expediting patient registration and restricting its ability to reduce outpatient wait times.

"We report the problems, but nothing is implemented to rectify the problems hence the system is not efficient enough and the waiting period will always be long." (P03)

"When the system fails, there is no actual administration assistance, and we only manage to get through with it thus impacting patient flow." (P10)

4.2 Discussion

This study has revealed that digital systems are associated with barriers which ultimately impact on patient waiting time According to healthcare providers, the constant system malfunctioning was a major disruption of the registration process forcing them to revert to the manual methods. It is in line with the international literature that depicts that technical unreliability in electronic health systems may significantly increase patient waiting time, decrease staff productivity, and distrust in digital interventions (Zhang et al., 2023). Data loss on failures of the system also contributes to delays, which shows how vulnerable the existing electronic structures are.

Inadequate Staff Training was found to be one of the biggest limitations. Lack of training meant that staff could not easily navigate the system or solve a problem and this resulted in problem with data entry and increased time of registration. This is consistent with other studies which indicated that, insufficient training can cause low competence of users and unwillingness to use digital health technologies (Malécot et al., 2022). This challenge is particularly experienced by new employees, which means that they should be inducted in a structured manner, and their professional development should be continued.

The study further indicates that, poor System Capacity at Periods of Peak led to long waiting periods. The failure of the system to manage large numbers of patients caused the personnel to go back to manual lists, which meant that the advantages of the digital registration system were nullified. This observation is similar to the literature on resource-constrained environments where system performance at times of high demand frequently defines the efficiency of the entire patient flow (Sialubanje *et al*, 2023).

The absence of Integration of registration points with other Hospital Systems led to duplication of data input, inefficiency and slowness in patient throughput. Digital registration differed in that it was not connected with pharmacy or laboratory systems, and patient data were required to be inputted into the system several times. It is also well-known that poor system interoperability is a condition that hinders health system efficiency and is one of the factors that contribute to long waiting times (Musonda et al., 2021). Operation was also hampered by the problems of Power and Connectivity. Regular power outages and unstable internet connectivity compelled employees to quit all digital solutions and start using manual operations. Similar context research has already shown that the infrastructural instability is an important factor influencing the sustainability of digital health intervention (Oeser & Romano, 2021).

The low-digital literacy patients especially the elderly found it difficult to use the self-service registration, thus asking the staff to assist them further, which led to delays among other patients. This highlights the role of the patient-centered design and education in deploying digital health solutions. Furthermore, according to the study, the old software had minor errors that had been accumulated over the years hence causing significant disruptions. It is important to

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maintain the systems with regular maintenance and software updates to ensure maintenance and reliability (Girmenia et al., 2020).

Lastly, Proper Administrative Support and Feedback was found to be a major obstacle. Inadequate feedback mechanisms and responsiveness of the management prevented the timely process of solving technical and operational issues, which reduced the motivation of the staff and the efficiency of patient flow. Digital adoption is needed to be supported by an organization that guarantees the seamless functioning (Bontia, Md & Babsa-ay, Md, 2024).

On the whole, these findings indicate that the issues of digital registration systems are complex and refer to technical, human, and organizational levels. The combination of the system malfunctions, under-training, infrastructural constraints, and change resistance is a cumulative delay, which can have a substantial impact on outpatient waiting.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The research shows that digital registration at public health facilities has a number of digital registration barriers which are interrelated to increase outpatient waiting time. The most common challenges are frequent system failures, staff incompetency attributed to lack of sufficient training, inadequate capacity of the system at times of peak period, lack of integration among other platform in the hospital, infrastructural problems (power and internet), patient related digital literacy challenges, obsolete software, staff opposition, and weak administration. These issues are to be overcome in order to have efficient registration of patients, less waiting time, and better patient satisfaction.

5.2 Recommendations

In order to improve outpatient digital registration, the study suggests updating infrastructure for maximum capacity, integrating registration with other departments to optimise patient flow, and guaranteeing dependable, well-maintained systems. It places a strong emphasis on providing thorough staff training, assisting with patient digital literacy, encouraging staff adoption through change management, and improving administrative responsiveness. To maintain efficiency and shorten outpatient wait times, it is also recommended that staff productivity, patient happiness, and system performance be regularly monitored and evaluated.

RFERENCES

Abeni, D., Rotunno, R., Diociaiuti, A., Giancristoforo, S., Bonamonte, D., Filoni, A., Schepis, C., Siragusa, M., Neri, I., Virdi, A., Castiglia, D., Zambruno, G., Bodemer, C., & Hachem, M. (2021). The Burden of Autosomal Recessive Congenital Ichthyoses on Patients and their Families: An Italian Multicentre Study. *Acta Dermato Venereologica*, *101*(6), adv00477. https://doi.org/10.2340/00015555-3822

Alodan, A., Alalshaikh, G., Alqasabi, H., Alomran, S., Abdelhadi, A., & Alkhayyal, B. (2020). Studying the Efficiency of Waiting Time in Outpatient Pharmacy. *MethodsX*, *7*, 100913. https://doi.org/10.1016/j.mex.2020.100913

Beck, D., Veliz, P. T., Munro-Kramer, M., Boyd, C., Sakala, I., Chiboola, N., & Lori, J. (2021). Exploring change over time in community mobilization domains: Results from a maternity waiting home intervention in rural Zambia. *International Journal for Equity in Health*, *20*(1), 228. https://doi.org/10.1186/s12939-021-01557-5

Bilandžić, J. (2022). A Prospective Observational Study to Assess Waiting Times to First Treatment in Patients Diagnosed with Brain Tumor. *Acta Clinica Croatica*, *61*. https://doi.org/10.20471/acc.2022.61.01.15

Biya, M., Gezahagn, M., Birhanu, B., Yitbarek, K., Getachew, N., & Beyene, W. (2022). Waiting time and its associated factors in patients presenting to outpatient departments at Public Hospitals of Jimma Zone, Southwest Ethiopia. *BMC Health Services Research*, *22*(1), 107. https://doi.org/10.1186/s12913-022-07502-8

Bolton Moore, C., Pry, J. M., Mukumbwa-Mwenechanya, M., Eshun-Wilson, I., Topp, S., Mwamba, C., Roy, M., Sohn, H., Dowdy, D. W., Padian, N., Holmes, C. B., Geng, E. H., & Sikazwe, I. (2022). A controlled study to assess the effects of a Fast Track (FT) service delivery model among stable HIV patients in Lusaka Zambia. *PLOS Global Public Health*, *2*(8), e0000108. https://doi.org/10.1371/journal.pgph.0000108

Bontia, Md, A. A. I., & Babsa-ay, Md, J. D. (2024). Factors Affecting Waiting Time of Patients Referred to Specialty Clinics from a Family Medicine Clinic in a Tertiary Government Hospital: A Retrospective Chart Review. *Acta Medica Philippina*, *58*(13). https://doi.org/10.47895/amp.v58i13.8098

Girmenia, C., Gentile, G., Micozzi, A., Petrucci, L., Malaspina, F., Di Prima, A., Baldacci, E., Bianchi, S., Pugliese, P., Turriziani, O., Antonelli, G., Tombolini, V., Foà, R., & Martelli, M. (2020). COVID-19 in Patients with Hematologic Disorders Undergoing Therapy: Perspective of a Large Referral Hematology Center in Rome. *Acta Haematologica*, *143*(6), 574–582. https://doi.org/10.1159/000510769

Haleema Muhamed. (n.d.). *Wainting time and Patients satisfaction*. 2023.

Licensed Under Creative Commons Attribution (CC BY-NC)

Hall, R., Harvey, M. R., & Patel, V. (2022). Diabetes care in the time of COVID -19: Video consultation as a means of diabetes management. *Practical Diabetes*, *39*(2), 33. https://doi.org/10.1002/pdi.2387

Hamoonga, T. E., Mutale, W., Igumbor, J., Bosomprah, S., Arije, O., & Chi, B. H. (2024). Preferences for pre-exposure prophylaxis delivery among HIV-negative pregnant and breastfeeding women in Zambia: Evidence from a discrete choice experiment. *Frontiers in Reproductive Health*, *6*, 1350661. https://doi.org/10.3389/frph.2024.1350661

Malécot, N., Chrusciel, J., Sanchez, S., Sellès, P., Goetz, C., Lévêque, H.-P., Parizel, E., Pradel, J., Almhana, M., Bouvier, E., Uyttenhove, F., Bonnefoy, E., Vazquez, G., Adib, O., Calvo, P., Antoine, C., Jullien, V., Cirille, S., Dumas, A., … Cavet, M. (2022). Chest CT Characteristics are Strongly Predictive of Mortality in Patients with COVID-19 Pneumonia: A Multicentric Cohort Study. *Academic Radiology*, *29*(6), 851–860. https://doi.org/10.1016/j.acra.2022.01.010

Musonda, M., Lupo, R., Muro, M., Grilli, G., Ogorzalek, K., Rubbi, I., & Artioli, G. (2021). Nurse's knowledge and perceptions on communicative hypnosis: An observational study. *Acta Biomedica Atenei Parmensis*, *92*(S2), e2021027. https://doi.org/10.23750/abm.v92iS2.11211

Naiker, U. (2017). *Waiting Times: The Outpatient Referral Process, Variation, Performance and Structural Influences* [Queensland University of Technology]. https://doi.org/10.5204/thesis.eprints.108004

Oeser, G., & Romano, P. (2021). Exploring risk pooling in hospitals to reduce demand and lead time uncertainty. *Operations Management Research*, *14*(1–2), 78–94. https://doi.org/10.1007/s12063-020-00171-y

Parast, L., Burkhart, Q., Bardach, N. S., Thombley, R., Basco, W. T., Barabell, G., Williams, D. J., Mitchel, E., Machado, E., Raghavan, P., Tolpadi, A., & Mangione-Smith, R. (2022). Development and Testing of an Emergency Department Quality Measure for Pediatric Suicidal Ideation and Self-Harm. *Academic Pediatrics*, *22*(3), S92–S99. https://doi.org/10.1016/j.acap.2021.03.005

Rapoport, C., Wells, C., Torres, G., Ortiz-Maldonado, R., Venkatachalam, S., Stradford, L., Gavigan, K., Boyd-Floering, B., Danila, M. I., Nowell, W. B., & Carandang, K. (2023). Balancing COVID -19 Risk With Physical and Mental Wellness: Perspectives of Patients With Autoimmune Rheumatic Diseases Throughout the Pandemic. *ACR Open Rheumatology*, *5*(6), 310–317. https://doi.org/10.1002/acr2.11551

Schmidt, S., Madsen, K. P., Pedersen-Bjergaard, U., Rytter, K., Hommel, E., Cleal, B., Willaing, I., Andersen, H. U., & Nørgaard, K. (2023). Associations between clinical and psychosocial factors and HbA1c in adult insulin pump users with type 1 diabetes. *Acta Diabetologica*, *60*(8), 1089–1097. https://doi.org/10.1007/s00592-023-02081-4

Sialubanje, C., Kaiser, J. L., Ngoma, T., Mwananyanda, L., Fong, R. M., Hamer, D. H., & Scott, N. A. (2023). Postnatal care services in rural Zambia: A qualitative exploration of user, provider, and community perspectives on quality of care. *BMC Pregnancy and Childbirth*, *23*(1), 39. https://doi.org/10.1186/s12884-023-05350-w

Tanabe, P., Ibemere, S., Pierce, A. E., Freiermuth, C. E., Bosworth, H. B., Yang, H., Osunkwo, I., Paxton, J. H., Strouse, J. J., Miller, J., Paice, J. A., Veeramreddy, P., Kavanagh, P. L., Wilkerson, R. G., Hughes, R., & Barnhart, H. X. (2023). A comparison of the effect of patient-specific versus weight-based protocols to treat vaso-occlusive episodes in the emergency department. *Academic Emergency Medicine*, *30*(12), 1210–1222. https://doi.org/10.1111/acem.14805

Villegas, A. C., Saylor, D., Kvalsund, M., Atadzhanov, M., Chiluba, C., Chishimba, L., Zimba, S., Chomba, M., & Siddiqi, O. K. (2021). Task-shifting to optimize outpatient neurological care in Zambia. *Human Resources for Health*, *19*(1), 88. https://doi.org/10.1186/s12960-021-00619-7

Zhang, H., Ma, W., Zhou, S., Zhu, J., Wang, L., & Gong, K. (2023). Effect of waiting time on patient satisfaction in outpatient: An empirical investigation. *Medicine*, *102*(40), e35184. https://doi.org/10.1097/MD.0000000000035184

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Influence of legal framework on own source revenue performance in Lake Region Economic Bloc counties, Kenya

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ABSTRACT

Own Source Revenue in Kenya is anchored in the 2010 Constitution, the Public Finance Management Act of 2012, and the County Government Act of 2012. Enhancing county-level revenue performance is essential for fiscal autonomy and effective public financial management. However, many counties continue to face challenges, including weak legal frameworks, limited citizen participation, inadequate diversification of revenue sources, and slow adoption of technology. This study was motivated by the persistent fiscal gaps in devolved governments, particularly within the Lake Region Economic Bloc, where counties have significant potential yet continue to underperform in revenue mobilization. The study examined the influence of the determinant—county legal frameworks—on own-source revenue performance, while also assessing how Gross County Product shapes these influences. It was guided by the sequential theory of decentralization. A descriptive survey design was employed, targeting 170 county officials from 14 counties within the bloc. Structured and unstructured questionnaires were used, and a pilot study was conducted in Uasin Gishu County to ensure reliability and validity. The findings revealed that enforceable county legal frameworks ($\beta = 0.198$, $p = 0.004$) enhanced Own Source Revenue (OSR) performance. Overall, county legal framework, public participation, tax diversification, and technology adoption significantly influenced OSR performance ($R^2 = 0.598$; $F = 19.890$, $p = 0.000$), with technology adoption showing the strongest effect ($\beta = 0.332$). Stronger Gross County Product (GCP) significantly moderated these relationships ($R^2 = 0.591$; $F = 30.625$, $p = 0.000$), amplifying the impact of determinants, especially technology and tax diversification. The study concludes that institutional reforms, supported by local economic growth, are essential for sustainable own-source revenue performance. It recommends that county governments strengthen revenue laws to achieve greater fiscal independence.

Keywords: County Legal Framework, Gross County Product, Own Source Revenue Performance,Technology Adoption, Tax Diversification

I. INTRODUCTION

Own Source Revenue (OSR) is widely recognized as a cornerstone of fiscal autonomy for sub-national governments. In principle, it allows local authorities to reduce overdependence on central transfers while improving service delivery. OSR supplements national transfers and is critical for sustaining public services (World Bank, 2021). Globally, OSR effectiveness is shaped by governance structures, economic activities, and administrative capacities. Developed economies, particularly in the European Union and North America, have implemented advanced fiscal decentralization frameworks that emphasize efficiency, accountability, and technological integration in revenue collection (Boadway & Shah, 2009). These models highlight the importance of legal frameworks, political will, and institutional efficiency in enhancing OSR performance (Smoke, 2013). Additionally, digital innovations, such as e-governance and automated tax systems, have significantly improved revenue collection efficiency (Gupta et al., 2017).

In Africa, the adoption of fiscal decentralization has not fully translated into strong revenue performance. While the reforms were designed to promote responsive local governance, weak enforcement of tax laws, limited administrative capacity, and poor taxpayer compliance have constrained outcomes (Fjeldstad & Heggstad, 2012). This experience underscores that political reforms without institutional strengthening are unlikely to yield fiscal sustainability.

Kenya's 2010 Constitution introduced devolution with the expectation that counties would achieve greater financial independence through OSR. More than a decade later, however, performance remains modest. Data from the Commission on Revenue Allocation (CRA) shows that between FY 2013/14 and FY 2022/23, counties mobilized only 63.5 percent of their OSR targets, collecting KSh 344.4 billion against projections of KSh 542.1 billion (CRA, 2023). On average, OSR contributes less than 10 percent of county revenues, indicating that counties remain heavily reliant on

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the national equitable share. This persistent gap suggests that devolution has expanded expenditure responsibilities without securing adequate revenue autonomy.

The underperformance of OSR in Kenya has multiple dimensions. Legal frameworks are often fragmented or inconsistently enforced, creating loopholes that weaken collection (Ooko, 2021). Variations in Gross County Product (GCP) have not consistently translated into revenue performance, raising questions about how economic capacity interacts with governance and administrative factors (KNBS, 2022).The Lake Region Economic Bloc (LREB), comprising 14 counties in western Kenya, offers a vivid case study of these challenges. Counties such as Kisumu and Kakamega have relatively high GCP but still fail to maximize OSR potential. Others, like Busia and Homa Bay, collect minimal OSR despite expanding economic activities (CRA, 2023; Ndung'u, 2021). These inconsistencies suggest that fiscal capacity alone does not guarantee revenue performance; rather, institutional, participatory, and technological dynamics play a decisive role.

The fiscal gap between potential and actual OSR has serious implications for county governance. Limited revenue mobilization weakens counties' ability to finance development priorities, expand infrastructure, and deliver essential services. CRA reports show that OSR constitutes less than 10 percent of county budgets, while the equitable share from the national government accounts for more than 70 percent of financing (CRA, 2024). Such dependence exposes counties to fiscal vulnerability and undermines the spirit of devolution.

This study was motivated by the need to examine why OSR remains weak despite counties having legal authority, constitutional support, and growing local economies. Scholars have long argued that revenue performance depends not only on economic factors but also on institutional quality, enforcement mechanisms, and taxpayer trust (OECD, 2020). In Africa, success stories such as Rwanda demonstrate that technology and stronger enforcement can improve compliance, yet in Kenya such reforms have been sporadic and uneven (Moore, 2015; Fjeldstad, 2016). For the LREB, which faces rising expenditure needs and urgent development challenges, understanding these dynamics is essential.

By interrogating the role of county legal frameworks—while considering the moderating effect of GCP—this study seeks to provide context-specific evidence. The findings are expected to inform both county and national policymakers on how to strengthen OSR as a pathway to sustainable devolution. The study focused on determinants that shape OSR performance. The county legal framework provides the rules and enforcement mechanisms for revenue collection. Where laws are inconsistent or weakly enforced, revenue leakages and poor compliance tend to follow (Ooko, 2021). Finally, Gross County Product (GCP**)** represents the economic potential of a county. Prior studies show that stronger local economies do not automatically guarantee higher OSR, suggesting that institutional and governance factors moderate the relationship between economic output and revenue performance (Ndung'u, 2021).

1.1 Statement of the Problem

Own Source Revenue (OSR forms a critical pillar of fiscal decentralization in Kenya, as it enables counties to finance development priorities and deliver essential services. Yet, counties have persistently underperformed in OSR mobilization, leading to an overreliance on intergovernmental transfers (CRA, 2019; Njoroge & Kinuthia, 2020). This dependency has created fiscal instability and undermined the constitutional goal of financial autonomy for devolved units (World Bank, 2021). Despite policy and institutional reforms, counties within the Lake Region Economic Bloc (LREB) continue to struggle with low OSR growth relative to expenditure needs, signaling that structural and administrative challenges remain unresolved.

Several factors are frequently cited in the literature as critical determinants of OSR performance, but gaps exist in their integration and empirical validation. County legal frameworks remain weak, inconsistent, or poorly enforced, resulting in revenue leakages and inefficiencies (Muchira, 2018). More importantly, there is scant empirical attention to how Gross County Product (GCP)—a measure of county-level economic output comprising agriculture, manufacturing, trade, services, and construction (KNBS, 2020)—moderates the influence. Counties with higher GCP may have stronger economic bases to support revenue mobilization, whereas those with weaker economic structures may remain disadvantaged despite implementing similar reforms. The absence of this moderating perspective limits understanding of why revenue performance varies widely across counties.

Thus, the problem is twofold: First, Persistent underperformance of OSR in LREB counties, reflected in inadequate revenues, high dependence on national transfers, and fiscal instability. Second, there is limited empirical evidence on how county legal frameworks influence OSR performance, especially when considered alongside the moderating role of GCP. This study was therefore motivated by the need to fill these gaps by empirically analyzing how the County legal framework interact with GCP to influence OSR performance in LREB counties. The findings are expected to generate actionable insights for policymakers seeking to strengthen fiscal autonomy and sustainability at the county level.

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1.2 Research Objectives

The specific objectives for this study are:

i. To evaluate the influence of legal framework on Own Source revenue performance in Lake Region Economic Bloc.
ii. To establish the moderating influence of Gross County Product on the Legal Framework on Own Source Revenue in Lake Region Economic Bloc.

1.3 Research Hypothesis

The study was guided by the following research hypothesis.

Ho_1: There is no significant influence of Legal Framework on the Own Source revenue performance in LREB.

$H0_2$: Gross County Product does not moderate the influence of Legal Framework on Own Source Revenue in LREB.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Sequential Theory of Decentralization

Falleti (2004) explains decentralization as a process that unfolds sequentially across political, administrative, and fiscal dimensions. The order of these reforms shapes outcomes: when fiscal powers follow administrative and political decentralization, subnational units enjoy both authority and capacity to raise revenues. Conversely, if expenditure responsibilities precede fiscal authority, local governments face unfunded mandates that weaken fiscal autonomy.

In Kenya, the 2010 Constitution devolved service delivery to counties, granting them OSR powers. However, the effectiveness of these powers depends on the enabling legal framework and the capacity built through earlier stages of decentralization (World Bank, 2020). Public participation—anchored in political decentralization—further strengthens accountability and voluntary compliance, making citizens more willing to support county revenue initiatives.

Sequential Theory informs the county legal framework and public participation variables**,** emphasizing that institutional design and sequencing directly influence counties' ability to raise and safeguard OSR. While decentralization theories are widely studied in Africa, most research emphasizes expenditure responsibilities or intergovernmental transfers rather than county-level OSR generation. The role of legal frameworks and public participation in shaping OSR performance remains underexplored. This study bridges that gap by applying Sequential Theory to examine how legal mandates and participatory mechanisms drive OSR outcomes in Kenyan counties.

2.2 Empirical Literature Review

Empirical studies on revenue performance have consistently highlighted that fiscal sustainability in devolved units depends on several interrelated factors. These include the legal and institutional frameworks guiding taxation, the extent of citizen engagement in fiscal matters, the diversification of revenue streams, the application of modern technology in tax administration, and the strength of the underlying economic base. This review synthesizes empirical findings related to these determinants of own source revenue (OSR), focusing on lessons drawn from both developed and developing contexts, and identifies the gaps that justify the current study in the Kenyan county government setting.

2.2.1 County Legal Framework and Own Source Revenue

Muriithi and Moyi (2003) applied a time-series econometric model using Kenya's national tax data between 1973 and 1999. Their results showed that while reforms temporarily improved buoyancy and elasticity of taxes, weak enforcement, administrative loopholes, and widespread exemptions hindered long-term revenue productivity. The methodological strength lay in the use of elasticity and buoyancy measures to assess productivity trends. However, the study predates the 2010 constitutional reforms that introduced county governments, meaning its insights are limited to the centralized fiscal system. The lack of a subnational focus highlights a gap in understanding how legal frameworks function under Kenya's devolved units.

Fjeldstad and Heggstad (2012) investigated local government revenue mobilization in Tanzania, Uganda, and Ghana through a comparative case study. Their research combined analysis of finance reports with interviews of policymakers and tax administrators. The study found that reliance on politically sensitive revenue bases, such as property taxes and business licenses, compounded by corruption and weak enforcement, led to poor revenue outcomes. This institutional and diagnostic approach generated valuable qualitative insights but did not quantify the scale of revenue losses. In addition, the focus on urban municipalities limits applicability to counties with predominantly rural structures, such as those in Kenya.

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Njoroge and Omweri (2019) conducted a survey in Nairobi City County involving 150 respondents, including policymakers and revenue officers. The study established that inconsistencies between county by-laws and national statutes created overlaps and weak enforcement, which in turn led to citizen resistance and reduced compliance. While the findings provided empirical evidence linking legal clarity to OSR at the county level, the single-county design limits generalizability, as Kenyan counties vary widely in terms of economic structures and institutional capacity. Broader multi-county research is therefore needed to capture these variations.

Oduor et al. (2021) used panel regression on data from 15 Kenyan counties between 2013 and 2018 to assess the influence of legal frameworks on revenue performance. Their analysis revealed that clear by-laws and stronger enforcement mechanisms reduced revenue leakages by about 20%. The study's econometric rigor and multi-county scope provided robust evidence of the role of legal frameworks. However, the analysis focused narrowly on the clarity of laws, without examining how counties align their by-laws with national legislation or the institutional processes that underpin enforcement. This gap points to the need for deeper exploration of harmonization practices.

Olabisi (2012) examined Lagos State, Nigeria, using surveys and administrative tax office records analyzed with descriptive statistics and correlation methods. The study found that inadequate training of tax officers, corruption, and weak enforcement mechanisms negatively affected revenue generation. The metropolitan context, however, makes the findings less transferable to Kenya, where counties encompass both urban and rural settings and operate under a devolved system with different institutional dynamics.

Bird and Slack (2020) conducted a comparative study of Latin American municipalities, analyzing how institutional arrangements and tax frameworks shape revenue performance. Their findings suggested that municipalities with stronger legal clarity and simplified frameworks achieved better compliance and broader tax bases. While informative, the study was largely focused on metropolitan municipalities, overlooking rural areas where informal economic activity dominates. This limits the direct applicability to Kenya's counties, which combine both urban and rural economies.

2.2.2 Gross County Product and Own Source Revenue

Ljungqvist and Smolyansky (2018) employed panel econometric models using U.S. state data from 1970 to 2013 to assess the impact of tax policy on employment and income. They found that corporate tax increases reduced employment and income, while tax cuts had stronger positive effects during downturns. The methodological rigor is notable, but the U.S. state-level context differs markedly from Kenyan counties, which face structural unemployment and weaker revenue bases. Gunter et al. (2019) conducted a cross-country econometric study on VAT and economic growth, finding nonlinear effects consistent with the Laffer curve. Their findings highlight the link between tax policies and economic performance, but the national-level focus on VAT is less applicable to Kenya's county OSR systems, which rely more heavily on licenses, fees, and service charges.

Nguyen et al. (2021) analyzed the U.K. economy using macroeconomic simulation models and found that reductions in income tax boosted GDP, consumption, and investment. The study demonstrates how economic strength enhances fiscal capacity, but the highly formalized U.K. economy contrasts sharply with the largely informal structures of Kenya's counties.

Bird (2015) offered a comparative analysis of emerging economies, arguing that stronger economic bases expanded the tax net and reduced fiscal crises. Although conceptually useful, the study lacked empirical focus at subnational levels, leaving open questions on how Gross County Product (GCP) interacts with OSR in devolved units such as Kenya's counties.

The reviewed literature consistently highlights a positive relationship between economic strength and revenue performance. While studies from developed and emerging economies provide useful theoretical and econometric evidence, their applicability to Kenyan counties is limited by differences in institutional structures and informality levels. This underscores the need for localized empirical studies that test how GCP influences OSR performance within Kenya's devolved governance framework.

III. METHODOLOGY

3.1 Study Area

The research focuses on examining the impact of the county legal framework on the own-source revenue of county governments within the Lake Region Economic Bloc in Kenya. The LREB represents one of the six economic blocs established in Kenya, encompassing 14 counties: Bomet, Bungoma, Busia, Homabay, Kakamega, Kericho, Kisii, Kisumu, Migori, Nandi, Nyamira, Siaya, Transnzoia, and Vihiga, all situated around Lake Victoria and its surrounding areas. The LREB was founded with the understanding that, although the devolved system of government aims to tackle enduring political issues related to inclusive governance, the counties might be insufficiently sized to capitalize on economies of scale. No prior research exists regarding the Own source revenue of the LREB as an economic bloc.

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3.2 Research Design

This investigation utilized a descriptive survey research framework. The primary objective of survey research design is to provide a detailed account of the current state of affairs (Kothari, 2011). The descriptive survey design enables the researcher to collect information, synthesize it, present findings, and interpret results for the sake of elucidation. The selection of the descriptive survey research design is predicated on the researcher's interest in the current state of affairs within the field, with the understanding that no variables will be manipulated in the process. The selection of a descriptive research design is predicated on its inherent flexibility. This enables the researcher to extrapolate the findings to a broader population context.

3.3 Target Population

The study focused on a cohort of 170 county officials within the County Revenue Administration Unit, individuals who possess a direct impact on the collection of own source revenue from the LREB Counties.

3.4 Sampling Design

The study utilized stratified and purposive sampling methods in its execution. Stratified sampling is employed when the characteristics of a population exhibit diversity, ensuring that each characteristic is adequately represented within the sample. This contributes to the broader applicability and credibility of the study, while also mitigating research biases such as undercoverage bias. In a stratified sample, the researcher categorizes the population into distinct subpopulations referred to as strata.

The research employed a specific sampling design to determine the sample size utilized in the study. An increase in sample size correlates with a reduction in the potential error associated with generalizing findings to the broader population (Saunders, Lewis and Thornhill, 2003; Creswell, 2009). The research employed the methodology established by Yamane (1967:886), subsequently refined by Saunders et al. (2003) and later adopted by Israel in 2013, to determine the appropriate sample sizes.

$$n = \frac{N}{1+N\,(e^2)}$$

Where:

n=sample size, N=population size, e=the error of sampling.

While the sampling error of 0.05. Therefore, using Saunders et al., (2003) formula the sample size of the study was 120 counties' staffs

The sample size is calculated as shown below.

$$n = \frac{170}{1+170\,(0.05^2)} = 120$$

A sample of 120 respondents was chosen instead of surveying the complete target population of 170 due to statistical, logistical, and methodological factors. Employing the formula of Saunders et al. (2003), the requisite sample size for a population of 170, with a 5% margin of error, was determined to be 120, hence insuring statistical representativeness of the sample. Moreover, surveying all 170 responders would necessitate increased time, money, and personnel, hence diminishing the efficiency of the operation. The chosen sample size was sufficiently large to encompass demographic variety, guaranteeing that the results would be generalizable while maintaining an acceptable margin of error (±5%). Additionally, survey fatigue and non-response concerns were acknowledged, as not all 170 individuals would be accessible or inclined to participate. The study engaged 120 respondents, representing 71% of the target population, adhering to best practices in social science research to ensure valid, reliable, and cost-effective data collecting, while achieving a confidence level of 95%. The study employed a basic random sampling procedure to select people within the strata. The Neyman allocation formula was employed to allocate respondents into the designated strata. The objective of the method is to optimize survey precision, given a predetermined sample size. The optimal sample size for stratum h, utilizing Neyman allocation, would be:

$$n_h = \left(\frac{N_h}{N}\right) n$$

Where,

n_h- The sample size for stratum h; n - Total sample size,

N_h -The population size for stratum h; N - The total population.

Hence, distribution was as follows;

3.5 Data Collection

Data collection is the acquisition of information, evidence, and facts from a designated population, enabling the formulation of conclusions, informed decision-making on critical matters, or the dissemination of knowledge to others. The provided information may be utilized by diverse entities, including educational institutions. The target respondents

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were one hundred twenty (120) officers in the County Revenue Administration Unit who directly impact the collection of own source revenue from the 14 LREB Counties. The researcher employed a questionnaire utilizing a Likert scale to gather data. The questionnaires contained structured questions. The researcher favored this method due to its ease of administration and efficiency in data collection within a brief timeframe.

3.6 Data Analysis

The researcher quantitatively examined data by summarizing it and employing descriptive statistics to facilitate a coherent explanation of the scores. Statistical quantifiable data was systematically evaluated to derive conclusions and recommendations. Data analysis approaches employed included measures of central tendency. Quality assessments at the primary level were conducted during data collection, whereas secondary level quality assessments occurred during data entry. The raw data was input into computers and analyzed utilizing the Statistical Package for the Social Sciences (SPSS). Data was given in frequencies and tables for comparative analysis and clarity. Multiple linear regressions utilizing SPSS were subsequently employed to examine the impact of the County Legal Framework, Public Participation, Tax Diversification, and Technology on the performance of Own Source Revenue among LREB counties. The subsequent model was implemented:

$$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon \quad \text{Equation 3.1}$$

Where,

Y = Own source revenue performance
β_0 =Constant or coefficient of intercept
X_1 = County legal framework.
X_2 = Public Participation
X_3 = Tax Diversification.
X_4 = Technology
β_1…. β_4 =Represents the corresponding coefficients for the respective independent variables
ε = Error term i.e. disturbance factors which represent residual or values that are not captured within the regression model.

3.6.1 Model for Testing the Moderating Effects

The moderating model investigates whether the association between an independent variable, X, and a dependent variable, Y, fluctuates based on varying levels of a third variable, Z. A moderating variable affects the strength and/or direction of the association between a predictor and an outcome, either enhancing, reducing, or modifying the predictor's impact. Moderating effects are defined as an interaction between factors or variables, where the impact of one variable depends on the levels of the other variable in the study. Aiken and West (1991) provide thorough elucidations of moderator effects along with a framework for their assessment and evaluation. Moderation effects were analyzed by moderated regression analysis, wherein all predictor variables and their interaction term are centered prior to model estimate to improve the interpretation of regression coefficients.

$$\mathbf{Y= \beta_0 + \beta_1X + \beta_2Z + \beta_3X*Z + \varepsilon} \quad \text{Equation 3.2}$$

Where:

Z – Moderator (Gross County Product)
X*Z –Interaction term that tests moderation

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics of the Variables

4.1.1 Influence of County Legal Framework on OSR Performance

This section will focuses on the influence of County Legal Framework on OSR Performance in LREB County governments. The summary of the descriptive statistic is as shown in Table 1 where the respondents rated various aspects of the county legal framework affecting OSR on a Likert scale. In the scale of 1-5(where 1=Strongly Disagree, 2=Disagree, 3=Undecided, 4=Agree, 5 = Strongly Agree).

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Table 1

County legal Framework Descriptive Results

Description	SD (%)	D (%)	U (%)	A (%)	SA (%)	Mean	S.D
Existing county by-laws provide a strong foundation for enhancing OSR collection.	2 (2.0)	8 (7.9)	15(14.9)	56(55.4)	20 (19.8)	3.87	0.91
The county's tax framework supports effective revenue mobilization.	21(20.8)	15(14.9)	23(22.8)	19(18.8)	23 (22.8)	3.11	1.45
County legal instruments are harmonized with national tax laws and policies.	8 (7.9)	4 (4.0)	28(27.7)	31(30.7)	30 (29.7)	3.74	1.30
Legal provisions adequately address revenue leakages and non-compliance.	6 (5.9)	5 (5.0)	15(14.9)	45(44.6)	30 (29.7)	3.91	1.08
Enforcement of county revenue laws is consistent and fair in practice	1 (1.0)	4 (4.0)	18(17.8)	54(53.5)	24 (23.8)	3.99	0.82

N=101

The descriptive statistics presented in Table 1 indicate that the county legal framework is an important determinant of OSR performance, though with varying levels of effectiveness across its components. The analysis is presented thematically under five sub-variables: county by-laws, tax frameworks, harmonization with national tax laws, legal provisions on revenue leakages, and enforcement practices.

Existing County By-Laws

The results show that respondents moderately agreed that existing county by-laws provide a strong foundation for enhancing OSR collection, with a mean of 3.87 and a standard deviation of 0.91. This suggests that counties in the LREB region have enacted legal instruments that respondents generally perceive as supportive of revenue mobilization. The relatively low variability indicates consistency of opinion across counties. These findings are consistent with Oduor et al. (2021), who demonstrated that the establishment of clear and enforceable by-laws significantly reduced revenue leakages by up to 20 percent, thereby improving revenue outcomes.

County Tax Framework

The county tax framework recorded the lowest mean score of 3.11 and the highest standard deviation of 1.45. This indicates considerable divergence in respondents' perceptions regarding the ability of county tax frameworks to support revenue mobilization. In some counties, respondents considered the tax framework adequate, while in others it was viewed as weak and ineffective. The wide variation mirrors the findings of Njoroge and Omweri (2019), who established that inconsistencies and ambiguities in county tax frameworks weakened enforcement mechanisms, reduced compliance, and ultimately constrained OSR performance.

Harmonization with National Tax Laws and Policies

The harmonization of county legal instruments with national tax laws and policies yielded a mean of 3.74 and a standard deviation of 1.30. While respondents generally agreed that county legal instruments align with national statutes, the variability indicates uneven implementation across counties. This implies that some counties have made significant progress in aligning their legal frameworks, whereas others continue to face challenges of disjointed systems. Njoroge and Omweri (2019) similarly noted that a lack of consistency between county and national legislation undermined compliance and weakened enforcement, thereby constraining OSR performance.

Legal Provisions Addressing Revenue Leakages and Non-Compliance

Respondents also agreed that legal provisions adequately address revenue leakages and non-compliance, with a mean score of 3.91 and a standard deviation of 1.08. This indicates that most counties have in place legal safeguards to minimize revenue losses, though their adequacy varies across jurisdictions. These findings corroborate Oduor et al. (2021), who emphasized that robust legal measures serve as an essential safeguard in sealing revenue loopholes, thereby contributing to stronger fiscal performance.

Enforcement of County Revenue Laws

Enforcement of county revenue laws emerged as the most positively rated sub-variable, with a mean score of 3.99 and the lowest standard deviation of 0.82. This reflects a strong consensus among respondents that enforcement practices are generally consistent and fair across counties. The findings underscore the importance of enforcement in enhancing compliance and revenue collection. Comparable evidence is presented by Olabisi (2012), who observed that inefficiencies in enforcement and tax administration in Lagos State had a detrimental effect on revenue performance, thereby highlighting enforcement as a critical determinant of OSR outcomes.

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Generally, the findings suggest that county governments in the LREB region have made significant progress in establishing legal frameworks supportive of OSR performance, particularly through by-laws, legal safeguards, and enforcement mechanisms.

4.1.2 OSR Performance

his section focuses on OSR Performance in LREB County Governments. The summary of the descriptive is as shown in Table 2.

Table 2

OSR Performance Results

LREB COUNTY	GCP (Million)	OSR COLLECTIONS (Million)					FIVE YEAR GROWTH RATE
	2023	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	%
KISUMU	**343,264**	804.39	1,248.06	1,199.15	1,153.46	1,443.61	**79.47%**
KAKAMEGA	**291,817**	1,180.33	1,111.11	1,221.67	1,309.68	1,347.83	**14.19%**
BUNGOMA	**268,684**	975.13	758.25	983.30	1,177.33	1,120.91	**14.95%**
KISII	**268,484**	719.00	702.00	898.00	1,019.00	1,180.00	**64.12%**
TRANS NZOIA	**231,741**	356.08	340.45	379.99	477.28	476.64	**33.86%**
KERICHO	**230,560**	473.73	595.98	566.82	501.35	841.93	**77.72%**
NANDI	**218,809**	-	-	-	200.74	630.73	
BOMET	**211,774**	201.51	183.01	201.51	242.40	238.93	**18.57%**
HOMA BAY	**184,466**	274.60	233.87	337.40	491.50	1,200.50	**337.18%**
MIGORI	**161,556**	305.69	288.54	386.87	406.36	512.57	**67.68%**
NYAMIRA	**150,928**	185.57	162.56	166.05	284.59	369.80	**99.28%**
SIAYA	**144,288**	179.43	332.88	434.38	508.04	610.74	**240.38%**
BUSIA	**123,819**	226.17	322.60	292.74	343.92	369.20	**63.24%**
VIHIGA	**109,075**	148.20	169.11	240.89	241.35	338.06	**128.11%**
TOTAL	**2,939,265**	**6,029.83**	**6,448.42**	**7,308.77**	**8,357.00**	**10,681.45**	**77.14%**
GROWTH RATE		**-**	**6.9%**	**13.3%**	**14.3%**	**27.8%**	

Source: Office of the Controller of Budget (2024); (KNBS, 2024)

Table 2 presents OSR collections for the 14 LREB counties between FY 2019/2020 and FY 2023/2024. The results indicate that total OSR mobilization rose steadily from KSh 6.03 billion in 2019/2020 to KSh 10.68 billion in 2023/2024, representing a 77.3% cumulative increase over five years. Annual growth fluctuated, recording 6.9 percent in 2020/2021, 13.3 percent in 2021/2022, 14.3 percent in 2022/2023, and peaking at 27.8 percent in 2023/2024. This upward trend demonstrates progressive improvements in counties' capacity to mobilize local revenue, though performance remained uneven across the bloc.

Counties such as Kakamega, Kisumu, and Bungoma consistently mobilized more than KSh 1 billion annually, reflecting relatively stronger legal frameworks, broader tax bases, and earlier adoption of automated systems. These results confirm the arguments by Oduor et al. (2021), who observed that institutional capacity and legal clarity significantly reduce revenue leakages. On the other hand, medium-performing counties such as Kericho, Migori, and Kisii displayed progressive but fluctuating revenue collections, often reflecting challenges in enforcement and limited diversification. For example, Kericho experienced a decline in 2022/2023 before rebounding strongly in 2023/2024. Low-performing counties, including Busia, Vihiga, and Nyamira, continued to collect below KSh 400 million annually despite modest improvements, echoing Mwangi's (2016) findings that weak public participation undermines compliance in smaller counties. A notable case was Homa Bay, which recorded a sharp increase from KSh 491.5 million in 2022/2023 to KSh 1.2 billion in 2023/2024, suggesting the success of reforms in diversification and technology adoption.

Two patterns emerge from these results. First, counties with higher Gross County Product (GCP) tended to achieve stronger OSR growth, consistent with Bird's (2015) assertion that economic bases expand the tax net and enhance fiscal resilience. Second, the sharp acceleration in growth in the final year may reflect the cumulative effects of enhanced automation, structured enforcement, and greater compliance, consistent with Mwaura and Karanja's (2022) findings on the transformative role of mobile payment platforms. Overall, while OSR performance in the LREB has improved significantly, disparities remain across counties.

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4.2 Correlation Analysis

Correlation analysis measures the strength and direction of the relationship between two variables. The Pearson correlation coefficient was used to assess the linear relationships between the independent variables and OSR performance.

Table 3
Correlation Matrix

		OSR Performance	Legal Framework	Public Participation	Tax Diversification	Technology
OSR Performance	Pearson Correlation Sig. (1-Tailed)	1				
Legal Framework	Pearson Correlation Sig. (1-Tailed)	0.375* 0.001	1			
Public Participation	Pearson Correlation Sig. (1-Tailed)	0.452* 0.008	0.271* 0.022	1		
Tax Diversification	Pearson Correlation Sig. (1-Tailed)	0.304* 0.036	0.050* 0.009	0.100* 0.056	1	
Technology Adoption	Pearson Correlation Sig. (1-Tailed)	0.426* 0.001	0.250* 0.060	0.325* 0.068	0.375* 0.017	1

*. Correlation is significant at the 0.05 level (1-tailed).

The results show a positive and significant relationship between legal frameworks and OSR performance **(r = 0.375, p = 0.001)**. This implies that counties with clearer by-laws, stronger enforcement, and better harmonization with national laws mobilize higher revenues. These findings align with Muriithi and Moyi (2003), who showed that weak enforcement and exemptions undermine long-term revenue productivity, and with Oduor et al. (2021), who established that clear by-laws reduced revenue leakages by 20%. Similarly, Njoroge and Omweri (2019) found that inconsistencies in county laws led to poor compliance.

4.3 Regression Analysis

Regression analysis was performed to evaluate the ability of the independent variables to predict the outcome of the dependent variable, under the assumption of a linear relationship, employing ANOVA and model coefficients.

Table 4
Model Summary of determinants and OSR Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.773[a]	0.598	0.580	0.7101

a. Predictors: (Constant), County legal framework, Public participation, Tax diversification, Use of technology
b. Dependent Variable: OSR Performance

Table 4 indicates that the regression model exhibits a robust fit, accounting for 59.8% of the variance in OSR Performance as explained by the predictors (County legal framework, Public engagement, Tax diversification, and Use of technology). The robust correlation (R = 0.773) and minimal standard error of estimate (0.7101) suggest that the model is dependable and the predictors substantially aid in elucidating the variance in OSR Performance.

As shown in Table 5, the researcher used ANOVA analysis to determine how well the regression equation predicted the dependent variable and fit the data.

Table 5
ANOVA Test results

Model		Sum of Squares	df	Mean Square	F	Sig
1	Regression	40.100	4	10.025	19.890	0.000[b]
	Residual	48.412	96	0.504		
	Total	88.511	100			

a. Dependent Variable: OSR Performance
b. Predictors: (Constant): Predictors: (Constant), County legal framework, Public participation, Tax diversification, Use of technology

According to Table **5**, the ANOVA test results demonstrate that the regression model is very significant (p-value = 0.000). The model accounts for a significant percentage of the variance in OSR Performance (Sum of Squares

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Regression = 40.100), and the F-statistic of 19.890 indicates that the model fits considerably better than one without predictors. This indicates that the determinants (County legal framework, Public engagement, Tax diversification, and Use of technology) combined play a significant role in elucidating the diversity in OSR Performance.

Furthermore, the outcomes of the regression tests are presented in Table 6.

Table 6

Coefficients of the Model

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig
1	Constant	13.290	2.218		5.992	0.000
	County Legal Framework, CLF	0.198	0.102	0.209	1.941	0.004
	Public Participation, PP	0.142	0.066	0.153	2.152	0.034
	Tax Diversification, TD	0.211	0.065	0.215	3.246	0.002
	Technology Adoption, TA	0.338	0.083	0.332	4.072	0.000

a. Dependent Variable: OSR Performance

Table 6 presents the regression coefficients of the model assessing the influence of county legal on Own Source Revenue (OSR) performance. The overall regression model was statistically significant, confirming that the determinants jointly explain a substantial proportion of the variation in OSR performance. The constant term (13.290, p = 0.000) represents the baseline level of OSR performance when all predictors are equal to zero.

The standardized coefficients allow for comparison of the relative strength of the predictors. Among the four determinants, use of technology (β = 0.332) had the strongest influence, followed by tax diversification (β = 0.215), county legal framework (β = 0.209), and public participation (β = 0.153). All predictors were statistically significant at the 5 percent level, meaning each variable contributed uniquely to explaining OSR performance.

The fitted multivariate regression model is

$$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4$$

$$Y= 13.290 + 0.198X_1 + 0.142X_2 + 0.211X_3 + 0.338X$$

The regression results indicate that county legal framework has a positive and significant effect on OSR performance (β = 0.198, p = 0.004). This implies that a one-unit improvement in the clarity, enforcement, or consistency of revenue-related by-laws leads to a 0.198 unit increase in OSR performance. The standardized beta of 0.209 further shows that the legal framework makes a meaningful contribution to explaining OSR outcomes. These findings are consistent with Oduor et al. (2021), who observed that clear and enforceable fiscal regulations reduce leakages and improve compliance.

4.4 Test of Moderating influence of GCP on Determinants.

The second objected aims to determine how Gross County Product (GCP) moderates the relationship between the Legal Framework and Own Source Revenue performance. To analyze the impact of this moderation, Frucot and Shearon (1991) developed a regression model that utilizes the absolute difference value of the independent variables. The results of this model, incorporating GCP as the moderating variable, are presented in Table 7.

Table 7

Moderated Regression Analysis

Indicators	B	Std Error	Beta	t	Sig
County Legal Framework, CLF	0.185	0.063	0.196	2.941	0.004
Public Participation, PP	0.132	0.061	0.142	2.152	0.034
Tax Diversification, TD	0.203	0.063	0.207	3.246	0.002
Technology Adoption, TA	0.300	0.074	0.294	4.072	0.000
Gross County Product, GCP	0.233	0.091	0.235	2.560	0.045
CLF_GCP	**0.118**	**0.039**	**0.125**	**3.063**	**0.031**
PP_GCP	0.091	0.036	0.098	2.529	0.013
TD_GCP	0.128	0.025	0.130	5.128	0.001
TA_GCP	0.232	0.036	0.228	6.370	0.002
Constant	13.290				
Prob F-Value	30.625				
Significant	0.000				
R square	0.591				
Adj R square	0.582				

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The moderated regression analysis presented in Table 7 examined the influence of Gross County Product (GCP) on the relationship between determinants and Own Source Revenue (OSR) performance. The overall model was statistically significant ($F = 30.625$, $p = 0.000$) and explained 59.1 percent of the variance in OSR performance ($R^2 = 0.591$; Adjusted $R^2 = 0.582$). This finding confirms that economic prosperity not only contributes directly to OSR performance but also strengthens the influence of county legal framework, public participation, tax diversification and technology adoption

The interaction between county legal frameworks and GCP was positive and significant ($\beta = 0.125$, $p = 0.031$). This result suggests that improvements in legal frameworks contribute more strongly to OSR in counties with higher levels of economic activity.

Summarily, the results demonstrate that GCP significantly moderates the relationship between all four determinants and OSR performance, with varying degrees of influence. The relative strength of the interaction influences shows that economic prosperity most strongly amplifies the benefits of technology adoption and tax diversification, followed by legal frameworks, and lastly public participation. These results are in line with Bird (2015) and Nguyen et al. (2021), who established that stronger economic contexts enhance fiscal capacity and magnify the effectiveness of institutional and technological reforms.The fitted moderation model is:

$$\mathbf{Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5GCP + \beta_6X_1*GCP + \beta_7X_2*GCP + \beta_8X_3*GCP + \beta_9X_4*GCP}$$

$$\mathbf{Y= 13.290 + 0.185X_1 + 0.132X_2 + 0.203X_3 + 0.300X_4 + 0.233GCP + 0.118X_1*GCP + 0.091X_2*GCP + 0.128X_3*GCP + 0.232\ X_4*GCP}$$

The main-effect coefficients show the direct influence of each determinant of OSR performance when GCP is held at zero. Specifically, a one-unit increase in the county legal framework **(X_1)** increases OSR performance by 0.185 units. The coefficient for GCP shows that a one-unit increase in county economic prosperity independently improves OSR performance by 0.233 units. This indicates that counties with stronger economies are, on average, better able to generate their own revenues.

The interaction terms are particularly important, as they show how GCP moderates the effect of each determinant. The positive coefficient of 0.118 for CLF×GCP indicates that the contribution of the legal framework to OSR increases by 0.118 units for every additional unit of GCP. In other words, legal reforms are more effective in wealthier counties.

In conclusion, this equation demonstrates that Gross County Product has a moderating influence on the four determinants to the OSR Performance. While legal frameworks, public participation, tax diversification, and technology all improve OSR independently, their influences become stronger in counties with higher levels of economic prosperity.

4.5 Hypothesis Testing

The multiple regression model testing the determinants of Own Source Revenue (OSR) performance was statistically significant ($F = 19.890$, $p = 0.000$) and explained 59.8% of the variance in OSR performance ($R^2 = 0.598$)**,** as presented in Table 5. The regression coefficients (Table 6) and moderated regression results (Table 7) were used to test the hypotheses. Figures 3 and 4 illustrate the fitted models. The results are interpreted below.

$H0_1$: County Legal Framework has no significant influence on OSR performance

The regression results indicated that the legal framework had a positive and significant effect on OSR performance ($\beta = 0.198$, $p = 0.004$). The null hypothesis was rejected. This means that strengthening county by-laws, compliance mechanisms, and enforcement significantly improves OSR. These findings are consistent with Oduor et al. (2021)**,** who found that clearer county by-laws reduce leakages by 20%, and Njoroge & Omweri (2019)**,** who demonstrated that inconsistencies in laws weaken enforcement and reduce compliance.

$H0_2$: Gross County Product does not moderate the relationship between determinants and OSR performance

The moderated regression model was significant ($F = 30.625$, $p = 0.000$; $R^2 = 0.591$). Interaction terms showed that GCP significantly moderated the effects of legal framework ($p = 0.031$).Thus, the null hypothesis was rejected. These results are consistent with Bird (2015)**,** who argued that stronger economic bases expand the tax net and reduce fiscal crises, and Nguyen et al. (2021), who showed that economic growth enhances fiscal capacity in developed economies.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study findings demonstrate that effective legal frameworks are indispensable for strengthening revenue collection. Counties that invest in robust and enforceable fiscal laws are able to minimize leakages, improve compliance, and build stronger financial foundations.

The moderating role of GCP underscores that reforms are not equally effective across all counties. Economic prosperity amplifies the benefits of legal, participatory, fiscal, and technological reforms. This insight contributes to the understanding that counties must not only pursue governance and fiscal reforms but also foster local economic growth to maximize revenue outcomes.

5.2 Recommendations

Based on the study findings, the following recommendations are proposed: At the policy level, county governments should review and harmonize their revenue-related laws to ensure clarity, fairness, and enforceability, supported by strong compliance mechanisms. National government agencies, particularly the Commission on Revenue Allocation (CRA), should provide oversight and technical guidance to counties in developing standardized fiscal frameworks and revenue policies. In addition, county governments should deliberate policies that stimulate local economic growth and attract investment, given that stronger Gross County Product (GCP) amplifies the effectiveness of fiscal and governance reforms.

At the theoretical level, the study recommends that future research to further develop sequential theory of decentralization theory by explicitly incorporating moderating factors such as economic prosperity into models of subnational revenue performance

REFERENCES

Alm, J., McClelland, G., & Schulze, W. D. (1992). Why do people pay taxes? Journal of Public Economics, 48, 21–48.

African Union. (2015). *Agenda 2063: The Africa we want*. African Union Commission.

Ahmad, E., & Brosio, G. (2015). *Handbook of multilevel finance*. Edward Elgar Publishing.

Alm, J., McClelland, G., & Schulze, W. D. (1992). Why do people pay taxes? *Journal of Public Economics, 48*(1), 21–48.

Bagozzi, R. P. (2007). The legacy of the Technology Acceptance Model and a proposal for a paradigm shift. *Journal of the Association for Information Systems, 8*(4), 244–254. https://doi.org/10.17705/1jais.00122

Bird, R. (2015). Improving tax administration in developing countries. *Journal of Tax Administration, 1*(1), 23–45.

Bird, R. M. (2015). *Fiscal decentralization and local finance in developing countries*. Edward Elgar Publishing.

Bird, R., & Bahl, R. (2008). Subnational taxes in developing countries: The way forward. *Public Budgeting & Finance, 28*(4), 1–25.

Bird, R., & Shah, A. (2009). *Fiscal federalism: Principles and practice of multiorder governance*. Cambridge University Press.

Bird, R., & Slack, E. (2020). *Financing urban government in developing countries through property taxation*. Lincoln Institute of Land Policy.

Blöchliger, H. (2015). The challenge of measuring fiscal decentralization. In E. Ahmad & G. Brosio (Eds.), *Handbook of multilevel finance* (pp. 37–57). Edward Elgar Publishing.

Boadway, R., & Shah, A. (2009). *Fiscal federalism: Principles and practice of multiorder governance*. Cambridge University Press.

Bordignon, M. (1993). A fairness approach to income tax evasion. *Journal of Public Economics, 52*(3), 345–362.

Bowler, S., & Donovan, T. (1995). Popular responsiveness to taxation. *Political Research Quarterly, 48*(1), 79–99.

Brodie, E., Cowling, E., & Nissen, N. (2009). *Understanding participation: A literature review*. Institute for Volunteering Research, NCVO, IVR, and INVOLVE.

Carroll, D. A. (2009). Diversifying municipal revenue structures: Fiscal policy trends and challenges. *Public Budgeting & Finance, 29*(1), 27–51.

Carroll, D. A., & Stater, K. J. (2009). Revenue diversification in nonprofit organizations: Does it lead to financial stability? *Journal of Public Administration Research and Theory, 19*(4), 947–966. https://doi.org/10.1093/jopart/mun025

Chatama, Y. J. (2013). The impact of ICT on taxation: The case of the large taxpayer department of Tanzania Revenue Authority. *Developing Country Studies, 3*(2), 91–100.

Cheeseman, N., Lynch, G., & Willis, J. (2016). Decentralization in Kenya: The governance of governors. *Journal of Modern African Studies, 54*(1), 1–35.

Licensed Under Creative Commons Attribution (CC BY-NC)

Commission on Revenue Allocation (CRA). (2019). *County own source revenue report*. Government Printer.
Commission on Revenue Allocation (CRA). (2023). *County own source revenue performance report 2013/14–2022/23*. Government Printer.
Commission on Revenue Allocation (CRA). (2024). Annual report and recommendations on equiTable share and county financing 2024. Government Printer.
Constitution of Kenya (CoK). (2010). *The Constitution of Kenya*. Government Printer.
Controller of Budget (CoB). (2015). *Annual county budget implementation review report 2013/2014*. Government Printer.
Crawford, V. P., & Sobel, J. (1982). Strategic information transmission. *Econometrica, 50*(6), 1431–1451.
Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008
Ebdon, C., & Franklin, A. L. (2006). Citizen participation in budgeting theory.*Public Administration Review, 66*(3), 437–447. https://doi.org/10.1111/j.1540-6210.2006.00600.x
Elton, E. J., Gruber, M. J., Brown, S. J., & Goetzmann, W. N. (2017). *Modern portfolio theory and investment analysis* (9th ed.). Wiley.
Fabozzi, F. J., Gupta, F., & Markowitz, H. M. (2014). The legacy of modern portfolio theory. *The Journal of Investing, 23*(1), 7–22. https://doi.org/10.3905/joi.2014.23.1.007
Falleti, G. T. (2004). A sequential theory of decentralisation and its influences on the intergovernmental balance of power: Latin American cases in comparative perspective. *Kellogg Institute Working Paper*.
Fjeldstad, O.-H. (2001). Taxation, coercion, and donors: Local government tax enforcement in Tanzania. *Journal of Modern African Studies, 39*(2), 289–306.
Fjeldstad, O.-H. (2009). New challenges for local government revenue enhancement in Tanzania. *ICTD Working Paper No. 4*. International Centre for Tax and Development.
Fjeldstad, O.-H. (2016). Revenue mobilization and tax administration in sub-Saharan Africa. *Journal of African Economies, 25*(4), 389–410. https://doi.org/10.1093/jae/ejw009
Fjeldstad, O.-H., & Heggstad, K. (2012). *Local government revenue mobilisation in Anglophone Africa* (Working Paper). Chr. Michelsen Institute.
Gil-García, J. R., & Pardo, T. A. (2015). E-government success factors: Mapping practical tools to theoretical foundations. *Government Information Quarterly, 22*(2), 187–216.
Gondo, E. M. (2010). *Fiscal management in Dangila Municipality, Ethiopia: Performance and policy implications*. Research Center in Public Administration and Public Services.
Government of Kenya. (2010). *The Constitution of Kenya*. Government Printer.
Gujarati, D. N., & Porter, D. C. (2009). *Basic econometrics* (5th ed.). McGraw-Hill
Gunter, S., Riera-Crichton, D., Végh, C. A., & Vuletin, G. (2019). Non-linear effects of taxation on growth. *Journal of Economic Growth, 24*(4), 397–420. https://doi.org/10.1007/s10887-019-09165-7
Gupta, S., Keen, M., & Shah, A. (2017). *Digital governance and revenue mobilization* (IMF Working Paper). International Monetary Fund.
Hendrick, R. (2002). Revenue diversification: Fiscal illusion or flexible financial management? *Public Budgeting & Finance, 22*(4), 52–72. https://doi.org/10.1111/1540-5850.00091
International Monetary Fund (IMF). (2020). *Enhancing domestic revenue mobilization in Sub-Saharan Africa*. IMF Publications.
Jordan, J. S., & Radner, R. (1982). Rational expectations in microeconomic models: An overview. *Journal of Economic Theory, 26*(2), 201–223.
Jorion, P. (2007). *Value at risk: The new benchmark for managing financial risk*. McGraw-Hill.
Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263–292. https://doi.org/10.2307/1914185
Kaiser, K., Eaton, K., & Smoke, P. (2010). *The political economy of decentralization reforms: Implications for aid effectiveness*. World Bank. https://doi.org/10.1596/978-0-8213-8490-3
Kariisa, M., & Nsamba, A. (2019). Public participation and revenue mobilization in Uganda's local governments. *African Journal of Public Administration and Management, 30*(1), 55–74.
Kariuki, J., & Sang, P. (2022). Digital revenue collection and efficiency in Kenyan counties. *International Journal of Public Administration, 45*(3), 420–437. https://doi.org/10.1080/01900692.2021.1884697
Kariuki, J., & Wanjala, B. (2018). Citizen participation and tax compliance in Machakos County, Kenya. *International Journal of Economics, Commerce and Management, 6*(4), 121–135.
Kariuki, P., & Sang, R. (2022). Challenges in county revenue collection: A case study of selected Kenyan counties. *African Journal of Public Administration, 14*(2), 45–63.

Licensed Under Creative Commons Attribution (CC BY-NC)

Kenya Institute for Public Policy Research and Analysis (KIPPRA). (2019). *Improving county own source revenue in Kenya*. KIPPRA.

Kenya National Bureau of Statistics (KNBS). (2024). *Gross County Product report 2022/2023*. KNBS.

Khaunya, M. F., Wawire, B. P., & Chepng'eno, V. (2015). Devolution in Kenya: Prospects, challenges, and the future. *International Journal of Research in Humanities and Social Studies, 2*(6), 23–35.

Kihehere, M. A. (2013). Citizen participation and health service delivery: The case of Itojo Hospital Ntungamo District Local Government, Uganda [Unpublished master's thesis]. University of the Western Cape.

Klein, P., & Lasse, L. (2009). Diversification, industry structure, and firm strategy: An organizational economics perspective. In J. A. Nickerson & B. S. Silverman (Eds.), *Economic institutions of strategy* (Vol. 26, pp. 289–312). Emerald Group Publishing.

Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson.

Lake Region Economic Bloc (LREB). (2020). *Lake Region Economic Bloc strategy*. LREB Secretariat.

Ljungqvist, A., & Smolyansky, M. (2018). To cut or not to cut? On the impact of corporate taxes on employment and income. *Finance and Economics Discussion Series 2018-006*. Board of Governors of the Federal Reserve System. https://doi.org/10.17016/FEDS.2018.006

Lusigi, B.(2021, December 23). Kakamega County surpasses revenue target by Shs. 26M.https://www.standardmedia.co.ke/western/article/2001432563/kakamegacountysurpasses-revenue-target-by-sh26m-now-eyeing-hospitals

Mandelbrot, B. B., & Hudson, R. L. (2004). *The (mis)behavior of markets: A fractal view of risk, ruin, and reward*. Basic Books.

Markowitz, H. (1952). Portfolio selection. *The Journal of Finance, 7*(1), 77–91. https://doi.org/10.1111/j.1540-6261.1952.tb01525.x

Martin, F., Smith, K., & Williams, J. (2012). Revenue diversification and fiscal stability: An empirical analysis of local governments. *Public Finance Review, 40*(5), 600–627. https://doi.org/10.1177/1091142112446840

Montgomery, C. A., & Wernerfelt, B. (1988). Diversification, Ricardian rents, and Tobin's q. *RAND Journal of Economics, 19*(4), 623–632.

Moore, M. (2015). Tax and the governance dividend. *World Development, 67*, 403–417. https://doi.org/10.1016/j.worlddev.2014.01.012

Morisset, J., & Izquierdo, A. (1993). Influences of tax reforms on Argentina's revenue (Policy Research Working Paper No. 1192). World Bank.

Muchira, J. (2018). The impact of legal frameworks on county revenue collection in Kenya. *East African Journal of Economics, 6*(1), 78–92.

Mugambi, M., & Kamau, J. (2019). Digital finance and county revenue collection in Kenya. *African Journal of Economic Policy, 6*(2), 112–128.

Muriithi, K. M., & Moyi, E. D. (2003). *Tax reforms and revenue mobilization in Kenya* (AERC Research Paper No. 131). African Economic Research Consortium.

Muriu, A. R. (2014). How does citizen participation impact decentralized service delivery? Lessons from the Kenya local authority service delivery action plan (LASDAP, 2002–2010). *International Journal of Social Science Tomorrow, 2*(2), 1–28.

Muth, J. F. (1961). Rational expectations and the theory of price movements. *Econometrica, 29*(3), 315–335. https://doi.org/10.2307/1909635

Mwesigye, E. K. (2013). Citizen participation and democratic development policies: A perspective of NAADS programme in Uganda [Unpublished doctoral dissertation]. University of Cape Town.

National Treasury of Kenya. (2018). *National policy to support enhancement of county governments' own-source revenue*. National Treasury.

Nayak, N. C., & Samanta, D. (2014). Understanding the role of participation in public service delivery: Evidence from rural West Bengal, India. *International Journal of Public Administration, 37*(12), 875–884. https://doi.org/10.1080/01900692.2014.903270

Ndunda, J. M., Ngahu, S. T., & Wanyoike, D. (2015). Analysis of factors influencing optimal revenue collection by county governments in Kenya: A case of Nakuru County. *International Journal of Economics, Commerce and Management, 3*(5), 25–45.

Ndung'u, N. (2021). Economic capacity and fiscal performance in Kenyan counties: Evidence from Gross County Product. *Journal of African Economies, 30*(2), 199–218. https://doi.org/10.1093/jae/ejaa024

Neave, G. (2000). Diversity, differentiation, and the market: The debate we never had but ought to have done. *Higher Education Policy, 13*(1), 7–21.

Ngicuru, J. (2017). *Revenue diversification and its influence on county revenue collection: A case study of Nairobi County* [Master's thesis, University of Nairobi]. University of Nairobi Repository.

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Nguyen, T., Onnis, L., & Rossi, R. (2021). The macroeconomic effects of income tax changes: Evidence from the United Kingdom. *European Economic Review, 132*, 103647. https://doi.org/10.1016/j.euroecorev.2020.103647

Njoroge, J., & Kinuthia, P. (2020). Fiscal decentralization and revenue mobilization in Kenyan counties. *International Journal of Economics and Finance, 12*(5), 155–167. https://doi.org/10.5539/ijef.v12n5p155

Njoroge, S., & Omweri, C. (2019). County legal frameworks and revenue mobilization: Evidence from Nairobi City County. *International Journal of Economics, Commerce and Management, 7*(6), 211–227.

Njuguna, E., & Moronge, M. (2020). Effect of integrated revenue management system on revenue collection in Nairobi County, Kenya. *International Academic Journal of Information Systems and Technology, 2*(1), 1–17.

Nyanumba, A., Rotich, G., Gekara, M., Keraro, V., & Okari, H. (2017). Influence of revenue diversification on the performance of counties in Kenya. *International Journal of Finance and Economics, 8*(2), 55–71.

Nyanumba, E., Nyamita, M., & Omwenga, J. (2017). Revenue diversification and sustainability of county governments in Kenya. *Journal of Economics and Finance, 8*(4), 12–22.

Oates, W. E. (2005). On the nature and measurement of fiscal illusion: A survey. *University of Maryland, Department of Economics Working Paper*.

Oates, W. E., & Schwab, R. M. (2015). The theory of regulatory federalism: The case of environmental management. *Annual Review of Resource Economics, 7*, 227–244. https://doi.org/10.1146/annurev-resource-100814-125018

Odhiambo, P. (2021). GIS mapping for revenue collection in Kenyan counties. *African Policy Institute*.

Odhiambo, R. (2021). Manual systems and revenue leakages in county governments: A Kenyan perspective. *African Journal of Public Finance, 13*(2), 64–79.

Odhiambo, T. (2021). Adoption of technology in county revenue collection: Benefits and challenges. *African Journal of Digital Governance, 10*(3), 77–101.

Odoyo, C. O., Oginda, M., Mark, O. J., Fredrick, O. A., Patrick, B. O., & Elijah, M. S. (2013). Influence of information systems on revenue collection by local authorities in Homa Bay County, Kenya. *Universal Journal of Accounting and Finance, 1*(1), 29–33. https://doi.org/10.13189/ujaf.2013.010104

Oduor, C., Wanjala, B., & Chege, P. (2021). Legal frameworks and own source revenue performance in Kenyan counties. *Journal of African Public Administration and Management, 32*(2), 89–107.

OECD. (2020). *Revenue statistics in Africa 2020*. OECD Publishing. https://doi.org/10.1787/africa_rev-2020-en

Office of the Controller of Budget. (2024, August). *County governments budget implementation review report for the financial year 2023/24*. Office of the Controller of Budget-Kenya.

Okafor, J. C. (2010). Local government financial autonomy in Nigeria: The state joint local government account. *Commonwealth Journal of Local Governance, 6*, 127–135.

Olabisi, J. (2012). Tax administration and revenue generation in Lagos State, Nigeria. *International Journal of Business and Social Science, 3*(8), 99–113.

Olken, B. A. (2010). Direct democracy and local public goods: Evidence from a field experiment in Indonesia. *American Political Science Review, 104*(2), 243–267. https://doi.org/10.1017/S0003055410000079

Omolo, J. (2022). Citizen participation and fiscal accountability in devolved governments: Evidence from six counties in western Kenya. *African Journal of Governance and Development, 11*(1), 45–63.

Omollo, A. (2020). Public participation and county budgeting in Kenya. *African Governance Review, 9*(4), 231–248.

Omollo, B. (2020). Political interference and its impact on county revenue administration. *Kenya Policy Review Journal, 7*(2), 129–145.

Ooko, J. (2021). Legal frameworks and tax compliance in devolved governments in Kenya. *Journal of African Public Policy, 6*(1), 34–49.

Organisation for Economic Co-operation and Development (OECD). (2020). *Revenue statistics in Africa 2020*. OECD Publishing. https://doi.org/10.1787/africa_rev-2020-en

Oyedijo, A. (2012). Strategic agility and corporate performance in the Nigerian telecommunication industry: An empirical investigation. *American International Journal of Contemporary Research, 2*(3), 227–237.

Peter, I. (2023). *Financial economics*. Boston College Press.

Philip, N., & Rotich, G. (2017). Influence of revenue diversification on performance of counties in Kenya. *International Journal of Innovative Finance and Economics Research, 5*(4), 45–56.

Republic of Kenya. (2010). *The Constitution of Kenya, 2010*. Government Printer.

Rezaei, M., Zare, M., Akbarzadeh, H., & Zare, F. (2014). The influences of information technology (IT) on employee productivity in Shahr Bank: Case study of Shiraz, Iran. *Applied Mathematics in Engineering, Management, and Technology, Special Issue in Management and Technology*, 1208–1214.

Riedl, B. M., & Ferguson, K. F. (1991). The limitations of modern portfolio theory: A critical review. *Financial Review, 26*(2), 1–12. https://doi.org/10.1111/j.1540-6288.1991.tb00364.x

Sander, C. (2003). *Less is more: Better compliance and increased revenues by streamlining business registration in Uganda* (Africa Region Working Paper Series No. 58). UK Department for International Development.

Licensed Under Creative Commons Attribution (CC BY-NC)

Sargent, T. J. (1993). *Bounded rationality in macroeconomics*. Oxford University Press.

Slemrod, J. (1990). Optimal taxation and optimal tax systems. *Journal of Economic Perspectives, 4*(1), 157–178. https://doi.org/10.1257/jep.4.1.157

Slemrod, J. (2002). *Trust in public finance* (NBER Working Paper No. 9187). National Bureau of Economic Research. https://doi.org/10.3386/w9187

Smoke, P. (2013). Why theory and practice are different: The gap between principles and reality in subnational revenue systems (Working Paper No. 13-13). Andrew Young School of Policy Studies, Georgia State University.

Sortino, F. A., & Price, L. N. (1994). Performance measurement in a downside risk framework. *Journal of Investing, 3*(3), 59–64. https://doi.org/10.3905/joi.3.3.59

Tanzi, V., & Zee, H. (2001). Tax policy for developing countries. *IMF Economic Issues, 27*, 1–30. International Monetary Fund.

Tsai, H.-F. (2018). *Value for money*. ANU Press.

Tuckman, H. P., & Chang, C. F. (1991). A methodology for measuring the financial vulnerability of chariTable nonprofit organizations. *Nonprofit and Voluntary Sector Quarterly, 20*(4), 445–460.

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

World Bank. (2015). *Kenya devolution: Building public participation in Kenya's devolved government*. World Bank. http://hdl.handle.net/10986/21663

World Bank. (2020). *Enhancing domestic resource mobilization: The role of revenue diversification in fiscal sustainability*. World Bank Publications.

World Bank. (2021). *Kenya public expenditure review 2021: From recovery to better spending for inclusive growth*. World Bank.

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Influence of computer programs on learning outcomes of learners with disabilities in public comprehensive schools in Saboti Sub-County, Kenya

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ABSTRACT

This study investigated the influence of computer programs on the learning outcomes of learners with disabilities in public comprehensive schools in Saboti Sub-County, Kenya. The study was directed by the Universal Design for Learning (UDL) framework, which emphasises the importance of offering various methods for learners to engage, access information, and illustrate understanding to meet their diverse needs. A descriptive research design was utilised to carry out the study. The study involved 1,509 individuals from 13 public comprehensive schools in Saboti Sub-County. According to the Krejcie and Morgan Table, a sample size of 310 respondents was identified as adequate. A total of 297 learners with disabilities were selected from this sample through a stratified random sampling, while 13 heads of institutions were included purposefully. Data were collected using structured questionnaires administered to learners with disabilities, and interviews were carried out with the heads of institutions. Descriptive statistics and the chi-square test were employed for the quantitative responses, whereas the qualitative responses were analysed in order to identify prevalent themes. The findings indicated learners with disabilities experienced advantages from computer programs like Access to Math, Live Scribe, and Big Calc. A significant number of learners with disabilities indicated that these tools enhanced their comprehension of the material, and a clear correlation was observed between the utilisation of the programs and improved learning outcomes. The findings indicate that computer programs can significantly enhance learning outcomes; however, it is essential for educators to receive proper training and for educational institutions to upgrade their ICT infrastructure in order to effectively utilise these tools.

Keywords: Computer Programs, Inclusive Education, Kenya, Learning Outcomes, Learners with Disabilities

I. INTRODUCTION

In the United States, many students in grades K-12 bring their own computers or tablets to school. A study by Stetter (2018) found that fourth-grade students with learning disabilities (LD) used reading applications that featured phonics instruction, timed reading, and vowel awareness on their own iPads as well as with pen and paper without the apps. Students with disabilities enjoyed learning on the iPads and were more engaged with their activities. Some significant computer intervention studies combined the computer with active, teacher-led instruction and feedback on these tactics (Stetter, 2018).

According to another study by Serero and Schlebusch (2025), it emphasised the significant role of information communication technology skills in promoting the development of such abilities for visually impaired learners in a full-service school. While teachers are enthusiastic about using information communication technologies, challenges still remain in effectively improving the skills of visually impaired students due to the lack of resources, inadequate training, and inconsistent utilisation of such information and communication technology strategies. In Zambia, Chileshe et al. (2025) determined that learners with visual impairment reported the utilisation of information and communication technology implements in their schools as a pleasant, transforming, inspiring encounter and, furthermore, demanding. Learners with visual impairment faced specific problems in accessing and efficiently using ICT resources, including a shortage of ICT devices and skilled staff, as well as insufficient time to develop Information and Communication Technology [ICT] skills. Other challenges included poor internet connectivity, outdated software, limited tactile visuals, a complicated website, and programs that were not easily accessible.

In Kenya, access to ICT equipment in schools remains limited. Makokha and Mutisya (2016) found that email is still not widely used as a tool for communication between learners and teachers. Most special schools offer ICT resources through digital literacy programs (DLP), such as laptops and tablets, but they invest very little in specialised tools to support children with disabilities and special educational needs. Omboto et al. (2022) noted that most devices are controlled by school officials or teachers who lack the necessary skills to use them effectively.

Given the significant influence computer programmes can have on learning outcomes for learners with disabilities, this study aims to address the gaps identified in both international and local contexts. This study, therefore,

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aimed to provide insights to guide policy and practice in Kenya, ensuring that learners with disabilities receive the support necessary to succeed academically.

1.1 Statement of the Problem

Inclusive education is supposed to give all students a fair chance to learn, including those with disabilities. In practice, though, this is not always the case. In Saboti Sub-County, many learners with disabilities do not have enough access to assistive technologies, like computer programs. Limited access often prevents students from fully participating in classroom activities and can sometimes lead to lower academic performance. There is limited information on how computer programs influence learning outcomes in public comprehensive schools in Saboti Sub-County. Very few studies have examined the effect of interactive computer-based tools on learners with disabilities in these schools. This study explored the relationship between computer programs and the learning outcomes of learners with disabilities by testing the following hypothesis: H_0: There is no statistically significant relationship between computer programs and the learning outcomes of learners with disabilities.

1.2 Research Objective

To investigate the relationship between computer programs and the learning outcomes of learners with disabilities in public comprehensive schools in Saboti Sub-County, Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Universal Design for Learning (UDL) Theory

The framework of Universal Design for Learning (UDL) originates from the architectural concept of universal design, which posits that by designing environments for the widest possible range of users from the start, we reduce barriers rather than adapting solutions. According to its definition UDL is a scientifically valid framework for guiding educational practice that (A) allows for flexibility in how information is presented how students react or demonstrate their knowledge and abilities and how they are engaged (B) lowers barriers in instruction offers suitable accommodations challenges and support and upholds high standards of achievement for all students including those with disabilities. The premise of UDL is that learner variability is the norm, not the exception. Each learner engages, represents, and expresses knowledge differently. Therefore, instruction and by extension, instructional tools like computer-based programmes must be designed to offer multiple pathways for engagement (the why of learning), representation (the what of learning), and action and expression (the how of learning). By providing flexible digital programmes (for example computer-based programmes), learners with disabilities can access content in alternative ways (representation), interact or respond using assistive options (action and expression), and remain motivated through meaningful and varied ways (engagement). According to Center for Applied Special Technology [CAST] (2018), such flexibility reduces barriers and improves equity in learning opportunities.

2.2 Empirical Review

Global academic studies indicate that the use of computer-assisted instruction (CAI), adaptive learning technology, and audio programs has been shown to improve the learning outcomes of learners with disabilities(Bouck et al., 2020; Stetter & Hughes, 2010; Torgesen et al., 2010)For example, research shows that learners with dyslexia experience improvements in phonemic awareness, reading accuracy, reading decoding, and reading comprehension through the use of CAI. Game-based CAI also enhances learners with disabilities' mathematics performance.

Torgesen et al., (2010) carried out a randomized study on a computer-assisted instruction (CAI) reading program for dyslexic learners in the United States. The results from the study indicated improvements in phonemic awareness, phonemic decoding, reading accuracy, rapid automatic naming, and reading comprehension that persisted through second-grade learners with disabilities. The researchers reported that the combined intervention helped learners perform significantly better than the control learners who had participated in their school's regular reading program. These results demonstrate that students with learning difficulties in elementary school can benefit from long-lasting literacy gains through managed reading CAI programs.

The findings from Stetter and Hughes (2010) indicate that interactive digital tools help students understand the material more effectively than traditional classroom methods, particularly in improving reading skills. Bouck et al. (2020) reported that students in a mathematics study performed better when they used game-based CAI software than when they were taught using other methods. The researchers emphasized that playful, game-like computer-assisted training best supports students struggling to acquire basic mathematics skills. The virtual manipulatives they investigated used eye-tracking with dyslexic learners. The study found that learners with reading difficulties performed significantly better on comprehension tests when they used the eye-tracking-assisted software than when they did not use the software.

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Abiatal and Howard (2020) examined math software designed using a constructivist approach specifically for deaf elementary school students in Namibia. Their findings indicate that assistive technology can significantly enhance students' abilities in mathematics, especially in multiplication and division. Assistive technology can enhance self-awareness, curiosity, teamwork, and metacognitive skills, indicating that learner-centred software supports independent learning. In Malaysia, Khalid et al. (2023) found that assistive technology tools benefit learners with learning disabilities, particularly in reading and writing. Their study showed that adaptive software is effective for students with disabilities. The enhancement of fundamental literacy skills was significantly achieved through software that offered structured and repetitive practice. Their findings showed that using adaptive technology, which offers consistent and targeted practice, can be an effective way to support learners with dyslexia. When students with dyslexia use this technology, repeatedly with focused practice, it supports improvements in their reading and writing and helps them become more confident in their learning.

According to Cui et al. (2018), the Yixue Squirrel adaptive learning system, when compared to traditional classroom instruction and another adaptive learning system, produced higher learning outcomes. This demonstrates that adaptive learning technologies in mathematics and reading instruction in China, particularly within the context of Chinese pedagogy, may outperform traditional methods. A study by Fadlilah (2022) explored the development of audio learning digital media designed for blind and visually impaired (BVI) learners in Indonesia. The researchers found that the software provided learners with visual impairments (BVI) with learning approaches that were clear, tailored to their needs, and enjoyable. Their research indicated that audio-accessible software could considerably enhance the active participation of learners with sensory impairments in educational environments.

Murithi and Yoo (2021) found that teachers in Kenya felt that schools did not have enough ICT resources, which made it hard to use technology while teaching the new curriculum. Furthermore, they note that most teachers reported receiving only basic computer literacy training. Although teachers perceived the use of computers as necessary, they faced difficulties integrating technology into their lessons. Consequently, these findings indicate that teachers' awareness of ICT importance does not automatically lead to effective classroom integration. Makewa and Mutie (2018) examined the use of computers by learners with special needs, revealing that those with learning disabilities often possessed superior digital skills compared to their teachers. This difference made technology use in the classroom less effective and sometimes led learners to take the lead when using digital resources. Even though there are not any specific academic metrics yet, this demonstrates that Kenyan learners are ready for learning through computer software. Their investigation indicates that Kenyan school studies reveal potential for ICT adoption, though it remains limited due to infrastructure shortages, gaps in teachers' skills, and low technology utilization (Makewa & Mutie, 2018).

Another study conducted in Kenya by Murithi et al. (2022) examined the utilization of listening assistive technologies and the academic performance of learners with hearing challenges in three primary schools located in Meru and Tharaka Nithi Counties, Kenya. According to the authors, despite the Kenyan government's efforts to train teachers and employ them in schools serving students with hearing impairments, "*academic performance in primary schools for learners with hearing impairments has been poor*" (p.57). The study adopted a mixed-methods descriptive design and found that while there was a positive correlation between the use of assistive listening devices and improved academic outcomes, the devices were "inadequate and poorly maintained," and their utilisation remained low. Challenges included learners' limited skills to use the devices, weak guidelines on device usage, and insufficient institutional support from the Ministry of Education and other stakeholders. The authors argue that "software alone does not ensure learning success without a proper support system"; issues of maintenance, user training, and continuous institutional backing must accompany technological provision. Their study calls for increased allocation of funds for procurement and maintenance of such devices. This clarifies that merely providing hardware and software without a sustainable infrastructure undermines the potential of assistive technologies for effective change in learner outcomes (Murithi et al., 2022).

Major et al. (2023) indicate that while global evidence consistently documents the positive influence of computer adaptive instruction, technology-assisted reading platforms, and audio-input programs on students' literacy and numeracy skills, the Kenyan context reveals important implementation complexities. Their study of the DPL (digital personalised learning) tool evaluated in Kenya showed that learners "benefit from personalised learning progress," but the tools were still at an early rollout stage, with many counties and pre-primary schools yet to integrate the devices fully into classroom practice. This suggests a clear gap: the existence of adaptive, technology-enabled programmes alone is insufficient unless accompanied by robust infrastructure, teacher support, and full classroom integration, highlighting the challenge of moving from promising pilot evidence to scale, consistency, and sustainable integration in Kenya's real-world schooling environment.

In particular, no detailed empirical research has been conducted in public comprehensive schools in Saboti Sub-County that uses interactive teaching aids developed for learners with disabilities. Most studies in this context have related technology use to inclusive teaching approaches, teacher professional learning, or the semi-rural Kenyan context with limited infrastructure. The absence of this comprehensive view makes it difficult to evaluate the influence of such technology on learning. While international and local studies confirm the potential of computer programs for learners

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with disabilities, no empirical study has investigated the specific influence of Access to Math, Live Scribe, and Big Calc on learning outcomes in public comprehensive schools in Saboti Sub-County, Kenya. This study seeks to address this gap.

III. METHODOLOGY

This study used a descriptive research design and was carried out in Saboti Sub-County, which covers 323.6 km² and has an estimated population of 202,372 (Kenya National Bureau of Statistics [KNBS], 2019). The study population included 1,496 learners with disabilities and 13 heads of institutions. A sample size of 310 respondents was selected based on the Krejcie and Morgan (1970) table. A stratified random sampling technique was used to select 297 learners with disabilities, while all 13 heads of institutions were selected purposively for the study.

Data were collected using structured questionnaires for learners with disabilities and interview schedules for the heads of institutions. Quantitative data were analysed using descriptive statistics, including means, frequencies, and percentages, and the chi-square test at a 0.05 significance level. Qualitative data were analysed thematically, with coding and direct quotations used to reflect participants' views.

Table 1

Target Population

Category	Target Population
Heads of institution	13
Learners with disability	1,496
Total	**1509**

According to the table, 310 people constituted a sample size from a target population of 1,509 persons. Since all heads of institutions were specifically chosen to take part in the research, the sample size consisted of 297 learners with disabilities and 13 heads of institutions totalling to 310 respondents. The strata for sampling the learners were based on the different categories of disabilities present in the schools. Furthermore, data were collected using questionnaires for learners with disabilities and structured interview schedules for heads of institutions.

The raw data gathered was analysed and examined for errors and omissions with both quantitative and qualitative data were coded to enable clustering of responses into different groupings. Since this study was descriptive in nature, the data was analysed and presented in tables using means, frequencies, and percentages. The study hypothesis was validated using the chi-square test of association at a significance level of 0.05. For qualitative data, thematic analysis and coding, were applied to the qualitative data to ensure clarity and consistency in reporting.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics and Discussion for Computer Programs

This table presents the distribution of responses on access to and use of the three assistive computer programs. The analysis used frequencies, percentages, and means derived from the Likert-scale items completed by respondents. The results in table 2 describes the availability and use of computer programs such as Access to Math, Live Scribe, and Big Calc.

Table 2

Descriptive Statistics for the Independent Variable (Computer Programs)

Statements		SD	D	U	A	SA	MEAN
Access to Math program is available and used.	F	27	22	38	83	102	**3.78**
	%	**9.9**	**8.1**	**14.0**	**30.5**	**37.5**	
Live Scribe program is available and used	F	17	35	28	87	105	**3.84**
	%	**6.3**	**12.9**	**10.3**	**32.0**	**38.6**	
Big Calc program is available and used	F	7	20	8	110	127	**4.21**
	%	**2.6**	**7.4**	**2.9**	**40.4**	**46.7**	

The descriptive statistics in Table 2 show that the three assistive computer programs Access to Math, Live Scribe, and Big Calc were generally available and actively used in the participating schools. Big Calc recorded the highest mean (4.21), followed by Live Scribe (3.84) and Access to Math (3.78). Between 70% and 87% of respondents either agreed or strongly agreed that the programs were accessible and in active use.

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It is evident from the data that Big Calc is the program students favour and the one they most often choose to use among the various programs. This tool is highly utilized and receives the top rating, which indicates that students appreciate the step-by-step problem-solving process. They are shown all the stages of the calculation rather than just the final answer. This was supported by a female head of institution aged 53, who remarked:

> "*Children with disabilities are not able to recall the steps in a math task. However, when they hear the explanation, follow the steps on their graphing-calculator screen, and observe how a calculation is performed through a multiple-line display, they are able to see the different parts of the computation and the steps involved. Big Calc helps them focus on all parts of the problem and view every component of the answer, not just the final result*."

Similarly, although to a lesser extent, Live Scribe and Access to Math also serve as valuable aids for learners with disabilities. Live Scribe employs both aural and visual effects to attract the learner's attention and enhance comprehension. In addition, Access to Math supports learners by allowing them to practice math concepts multiple times, which strengthens their understanding of the procedures and promotes fluency. Among the three programs, Access to Math can best explain a method and help students internalize mathematical concepts. Nevertheless, Big Calc provides the most structured support for promoting the acquisition of mathematical methods.

These findings are consistent with the principles of Universal Design for Learning (UDL). According to CAST (2018), UDL advocates for multiple ways of explaining ideas, motivating learners, and facilitating interaction with materials to meet diverse learning needs. Therefore, the analysis highlights the importance of both the availability of computer programs and the integration of lesson plans for carrying out meaningful learning experiences.

The results further indicate that Big Calc is by far the strongest instrument for special educational needs students, particularly in facilitating their comprehension of complicated processes through a clear visual representation. Similarly, Live Scribe and Access to Math are mainly learning devices designed to make learners' understanding easier and to support the consolidation of already acquired knowledge. Hence, students become more effective with these tools when they are both accessible and actively utilized during lessons. Consequently, teacher involvement in guiding the effective usage of the programs is equally essential for achieving meaningful learning outcomes

4.2 Descriptive Statistics and Discussion for Learning Outcomes

Following the analysis of program usage, descriptive statistics were generated for the dependent variable, learning outcomes. Participants were asked to rate the extent to which each program improved their learning. The results are presented in Table 3.

Table 3

Descriptive Statistics for the Dependent Variable (Learning Outcomes)

Statements		SD	D	U	A	SA	MEAN
Access to Math improved your learning outcomes	F	27	22	38	83	102	**3.78**
	%	**9.9**	**8.1**	**14.0**	**30.5**	**37.5**	
Live Scribe improved your learning outcomes	F	17	35	28	87	105	**3.84**
	%	**6.3**	**12.9**	**10.3**	**32.0**	**38.6**	
Big Calc improved your learning outcomes	F	7	20	8	110	127	**4.21**
	%	**2.6**	**7.4**	**2.9**	**40.4**	**46.7**	

According to the descriptive statistics in Table 3, Live Scribe and Access Math have received a positive response, with 70.6% and 68.0% of the respondents indicating that their learning outcomes had improved as a result of the programs. Notably, Live Scribe scored slightly higher than Access Math, with a mean of 3.84, while 12% of the students disagreed with this result, which represents a variable phenomenon that warrants further investigation, and the table further reveals a definite tendency towards assessing all three assistive programs as having a positive influence on learning outcomes. Specifically, Live Scribe, through the aural and visual components, stimulates the attention of the student and supports the retention of information, while Access Math stimulates practice and fluency in operations. Nevertheless, Access to Math is the program that can best explain a method and facilitate the internalization of mathematical concepts, whereas Big Calc plays the most significant role in promoting the acquisition of mathematical methods. This conforms to recent research that evaluated adaptive and interactive computer programs as means to enhance the academic achievement of learners with disabilities. Such programs were found to be very efficient in leading to better academic results, as reported by Bouck et al. (2019) and Torgesen et al. (2010), and similarly, students who had regular access to these programs manifested growth in comprehension, retention, and engagement in learning. The differential effectiveness of the instruments, especially the prominence of Big Calc, indicates that it is very important to select the tools that best meet the students' particular needs. Moreover, the presence of the teacher and the planned use of the tools in the lessons further enhance effectiveness, and in general, the descriptive analysis serves as a confirmation of the combined use of these programs in leading to an improved learning quality of students with disabilities.

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4.3 Inferential Analysis

The study tested the null hypothesis (H_0) that there is no statistically significant relationship between computer programs and the learning outcomes of learners with disabilities in public comprehensive schools in Saboti Sub-County. A chi-square test of association was conducted to examine this relationship, as shown in Table 4.

4.3.1 Association between Computer Programs on Learning Outcomes of Learners with Disabilities in Public Comprehensive Schools in Saboti Sub-County

Table 4 below displays the results of the Chi-square test performed to investigate the association between the utilisation of computer programs and the learning outcomes of students with disabilities in public comprehensive schools in Saboti Sub-County.

Table 4

Chi-Square Test

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	445.588[a]	269	.000
Likelihood Ratio	320.754	269	.000
Linear-by-Linear Association	99.761	1	.000
N of Valid Cases	271		

a. 271 cells (95.8%) have expected count less than 5. The minimum expected count is .01.

According to Table 4, the p-value (p=0.000) is less than the 0.05 significance level indicating that the null hypothesis (H_0) was rejected leading to the conclusion that there is a statistically significant relationship between computer programs and the learning outcomes of learners with disabilities. The results correspond with the Universal Design for Learning (UDL) structure, which advocates for provisions of multiple means of representation, action, and engagement to effectively support the needs of diverse learners**.** The results agree with the studies conducted by Bouck et al. (2019) and Torgesen et al., (2010), which found that specialized computer programs significantly improve academic learning outcomes for learners with disabilities by offering personalized, co-operative, and clear learning experiences.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The results from this research revealed that the most influential factor for the outstanding educational achievements of learners with disabilities in public comprehensive schools in Saboti Sub, County was the access to Math, Live Scribe, and Big Calc. The frequent utilization of these computer programs gives learners more opportunities to follow the teacher's instructions, get involved in the class, and enhance their numeracy skills to a higher level. The findings presented in this report point to the great significance of using computer, based programs as learning aids to facilitate the implementation of an inclusive education system. Therefore, educational institutions need to be certain that these programs are always in place, and teachers must be given adequate training and support to use them effectively in the classroom for learners with disabilities to thrive academically**.**

5.2 Recommendations

Based on the findings of the study, it is recommended that educators use computer programs into their regular classes in order to provide assistance to learners with disabilities. Lessons can be simplified with the help of these technologies, to encourage more active engagement in the classroom. It is of the utmost importance for educational institutions and policymakers to make certain that there is an adequate supply of computers and technology, and that teachers are well prepared to make efficient use of these resources. The purpose of future study should be to investigate how these programs influence learners with a variety of disabilities throughout an extended period of time in order to improve on inclusive education.

REFERENCES

Abiatal, L. K. S., & Howard, G. R. (2020). Constructivism-led assistive technology: An experiment at a Namibian special primary school. *South African Journal of Childhood Education, 10*(1), Article a794. https://doi.org/10.4102/sajce.v10i1.794

Bouck, E. C., Mathews, L., & Peltie, C. (2019). Virtual manipulatives: A tool to support access and achievement with middle school students with disabilities. *Journal of Special Education Technology, 35*(1), Article 0162643419882422. https://doi.org/10.1177/0162643419882422

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Bouck, E. C., Park, J., & Stenzel, K. (2020). Virtual manipulatives as assistive technology to support students with disabilities with mathematics. *Preventing School Failure: Alternative Education for Children and Youth, 64*(4), 281–289. https://doi.org/10.1080/1045988X.2020.1762157

CAST. (2018). *Universal Design for Learning Guidelines, Version 2.2*. Wakefield, MA: Author. https://udlguidelines.cast.org/static/udlg2.2-text-a11y.pdf

Chileshe, E., Annie, P. A., & Kasonde, M. (2025). Experiences of learners with visual impairment in the use of information communication technology in two selected schools in Kabwe District. *International Journal of Research and Innovation in Social Science, 9*(3), 3091–3107. https://doi.org/10.47772/IJRISS.2025.903SEDU0219

Cui, W., Xue, Z., & Thai, K.-P. (2018). Performance comparison of an AI-based adaptive learning system in China. In *Proceedings of the 2018 Chinese Automation Congress (CAC)* (pp. 3170–3175). IEEE. https://doi.org/10.1109/CAC.2018.8623327

Fadlilah, M. (2022). The role of digital media in language learning for blind students at junior high school. In *Proceedings of the Sixth International Conference on Language, Literature, Culture, and Education (ICOLLITE 2022)*. Atlantis Press. https://doi.org/10.2991/978-2-494069-91-6_47

Kenya National Bureau of Statistics. (2019, November). *2019 Kenya Population and Housing Census, Volume I: Population by County and Sub County*. Nairobi, Kenya. https://www.knbs.or.ke/wp-content/uploads/2023/09/2019-Kenya-population-and-Housing-Census-Volume-1-Population-By-County-And-Sub-County.pdf

Khalid, A. H. A., Mohkhlas, N. N., Zakaria, N. A., Mat Rejab, M., Karim, R. A., & Suharsiwi, S. (2023). Assistive technology for children with learning disabilities: A systematic literature review. In *2023 17th International Conference on Ubiquitous Information Management and Communication (IMCOM)* (pp. 1–6). https://api.semanticscholar.org/CorpusID:256668298

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Major, L., Daltry, R., Otieno, M., Otieno, K., Zhao, A., Hinks, J., & Friedburg, A. (2023). Randomised controlled trial protocol: Digital personalised learning to improve literacy and numeracy outcomes in Kenyan classrooms. EdTech Hub. https://edtechhub.org/2023/08/15/emerging-findings-from-a-randomised-controlled-trial-involving-pre-primary-learners-and-eidu/

Makewa, L. N., & Mutie, J. M. (2018). Assistive technology for managing learners with special needs in Makueni County, Kenya. *Journal of Research Innovation and Implications in Education, 2*(1), 32–43. https://www.researchgate.net/publication/324898050_Assistive_Technology_for_Managing_Learners_with_Special_Needs_in_Makueni_County_Kenya

Makokha, G. L., & Mutisya, D. N. (2016). Status of e-learning in public universities in Kenya. *International Review of Research in Open and Distributed Learning, 17*(3), 341–359.

Murithi, J., & Yoo, J. E. (2021). Teachers' use of ICT in implementing the competency-based curriculum in Kenyan public primary schools. *Innovation and Education, 3*(1), 1–11. https://doi.org/10.1186/s42862-021-00012-0

Murithi, S., Mwirichia, S., & Gichohi, P. M. (2022). How utilization of augmentative and alternative assistive technologies affect the academic performance in primary schools for learners with hearing challenges in Meru and Tharaka Nithi Counties, Kenya. *International Journal of Professional Practice, 10*(3), 57–67. https://doi.org/10.71274/ijpp.v10i3.238

Omboto, C. M., Kanga, A., & Njageh, A. R. K. (2022). Myth or reality: Digital literacy programme implementation in primary special schools in Nairobi, Kenya. *European Journal of Education (EJED), 5*(2), 51–66.

Serero, P., & Schlebusch, G. (2025). Exploring teaching strategies to enhance ICT skills in visually impaired learners: Implications for inclusive education. *Educational Challenges, 30*(2), 71–85. https://doi.org/10.34142/2709-7986.2025.30.2.06

Stetter, M. E. (2018). The use of technology to assist school-aged students with high incidence special needs in reading. *Education Sciences, 8*(2), 61. https://doi.org/10.3390/educsci8020061

Stetter, M. E., & Hughes, M. T. (2010). Computer-assisted instruction to enhance the reading comprehension of struggling readers: A review of the literature. *Journal of Special Education Technology, 25*(4), 1–16. https://www.learntechlib.org/p/113972/

Torgesen, J. K., Wagner, R. K., Rashotte, C. A., Herron, J., & Lindamood, P. (2010). Computer-assisted instruction to prevent early reading difficulties in students at risk for dyslexia: Outcomes from two instructional approaches. *Annals of Dyslexia, 60*(1), 40–56. http://www.jstor.org/stable/23765402

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Effect of technical and vocational education and training on youth self-employment in Rwanda: A case study of Rusizi District, Rwanda

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ABSTRACT

This study investigates the determining factors associated with Technical and Vocational Education Training (TVET) on youth self-employment in Rwanda, particularly focusing on the TVET program implemented by Rusizi district. This included detecting the enterprise typologies established by TVET graduates, assessing their contributions to the local labour market, and investigating whether there was any association between graduates of TVET and job creation. The theories used were Search-matching Theory, Human Capital Theory and Lifelong Learning Theory. The study employed a descriptive research design. Through descriptive statistical analysis, the study collected data from 72 self-employed youths out of a total target population of 258 that was derived using the Yamane formula. Information was gathered using a questionnaire and interview guide. The study results further show that TVET graduates are contributing significantly to job creation in the district. They do a range of entrepreneurial activities, from masons, vendors (caterers/event decorators), and poultry farmers, through production to sales, and mobile/computer repair. TVET graduates are job creators; they use skills in painting and decoration (95.5%), masonry (98.4%) and machinery operation. 95.5% Through in-demand skill development (95.5%), business startup (92.6%) and entrepreneurship promotion (98.4%), resulting in job creation The following chart shows that 95.5% of the employers agree that TVET contribution to job creation is vital because it provides occupation-specific skills, while 98.5% argue that TVET helps in addressing skills shortages and enhances worker productivity. The study identifies key job creation areas stemming from TVET, including painting and decoration, shoe-making, masonry, lumbering, machinery operation, and carpentry. The findings indicate that TVET plays a crucial role in fostering skill development, promoting the establishment of owner-operated firms, and encouraging business initiatives, which collectively contribute to the diversification of the local economy. Furthermore, a significant relationship is established between TVET and job creation, underscoring its importance in enhancing employment opportunities for the youth in Rusizi district. The study thus suggests a reinforcement of entrepreneurship-education programs and closer linkages between TVET centres and industries as the key areas that policymakers should focus on going forward. It further suggests greater investment in TVET infrastructure, policies that promote young entrepreneurs, and raising awareness among politicians about the importance of TVET. It also discourages youth from pursuing self-employment by training, urging them to rely a lot on mentorship as well as consistent learning and specialising in niche markets with the embracement of innovation.

Keywords: Rusizi District, Rwanda, TVET Program, Vocational Education Training, Youth Self-Employment

I. INTRODUCTION

Technical and Vocational Education and Training (TVET) serves as a strategy for developing human capital by combining broad educational foundations with technical knowledge and practical skills. This training is provided both in formal educational settings and workplace environments, ranging from certified diploma programs to various skill-building activities (Lawal, 2019). According to Todd and Dunbar (2018), TVET includes all types of learning, whether formal, non-formal, or informal, that take place in institutions or on the job, preparing individuals for a wide range of economic and social roles." In Rwanda, TVET has become a cornerstone of workforce modernisation and skills development since 2008, supporting foreign investment and sustainable growth.

TVET supports continuous professional development by offering technical training and transferable competencies (Njenga, 2022). In today's knowledge-based economy, individuals must adapt to technological changes as traditional career paths decline. TVET retrains displaced workers and empowers learners to achieve professional goals, fostering equal opportunity regardless of background (Porres et al., 2014).

According to Pongo (2014) in the modern knowledge-based economy, the responsibility of keeping up with change increasingly falls on the individual. Traditional full-time jobs with fixed career paths are becoming less common. As technology rapidly transforms the workplace, many workers face redundancy. Okoth (2023) noted that TVET plays a critical role in retraining these individuals and preparing them for emerging roles. Beyond job readiness, TVET also

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contributes to individual empowerment, supporting learners in realizing their professional aspirations and broader life goals. It is instrumental in helping people overcome social and educational disadvantages, fostering equal opportunity regardless of background (Porres et al., 2014).

According to Okoth (2023), TVET promotes economic growth by boosting individual productivity, with returns that often surpass the costs of education. Like other forms of education, it also contributes to social development by enhancing the ability of individuals to engage in meaningful social and economic activities. TVET helps develop a range of personal capabilities characteristic of a well-rounded education, including critical and creative thinking, effective communication, and interpersonal relationship skills (Lamichhane, 2013).

Despite these benefits, Rwanda continues to face a significant youth unemployment challenge, which poses risks to social stability and economic development. With over 60% of the population under 30 (Kawuki et al., 2022), TVET boosts economic growth by enhancing individual productivity and social development (Okoth (2023). It cultivates critical thinking, communication, and interpersonal skills (Lamichhane, 2013). Despite these benefits, Rwanda faces significant youth unemployment (estimated at 20% in 2022), driven by labor market structural issues (Malamud & Wetzels, 2021).

Martinez-Fernandez (2023) stated that lots of young people in Rwanda are occupied with informal jobs, and this kind of occupation is defined by the absence of job security and low payment, thus, the contribution to the poverty cycle. Another cause of this scenario is the lack of correlation between education and the expectations of the employer. The graduates often find themselves in the labour market lacking the practical skills needed by employers and the generation of formal employment opportunities has not been matched by the increased labour supply(Watwana, 2014). Such skills gap does not only restrain personal career opportunities, but also suppresses the overall economic development in the area.

According to Niwemwiza (2021) a major contributor to youth unemployment in Rwanda is the disconnect between the education and training system and the needs of employers. Many graduates lack the practical skills required in the current job market, leading to a surplus of job seekers who are not workforce-ready (Lema, 2024).The situation has been complicated by the poor correlation between education system and labour market requirements, with a sluggish rate of job creation in the formal industry compiling the already reduced access to quality employment chances (International Labour Organization, 2018).

Goulart et al. (2022) said that most students are now taught subjects that are focused on theory with little preparation of practical skills that are needed in the modern world of employment. This has resulted in a lot of graduates who leave school with no ability to displays the required competency needed in the workplace thus reflects in frustration, discouragement, and underemployment. Such skills gap not only limits the career prospects of individuals but also limits the expansion of the economy as industries are not able to acquire the skilled workforce to fuel its growth and compete favorably on the market (Hakizayezu, 2022). It is worsened by the fact that the number of graduates in the workforce continues to rise yearly.

The rapid expansion of higher education institutions has produced a surplus of degree holders competing for a limited pool of jobs. This heightened competition leaves many qualified candidates unemployed, emphasizing the urgent need for systemic reforms to address labor market inefficiencies (Caria et al., 2024). The pressure to secure employment often drives graduates to accept positions far below their qualifications, resulting in dissatisfaction and, over time, a potential devaluation of academic degrees in the eyes of employers). Rising graduate numbers intensify job competition, leading to underemployment and credential devaluation (Martinez-Fernandez, 2023; Caria et al., 2024).

To tackle youth unemployment, Rwanda has prioritized Technical and Vocational Education and Training as a central approach, focusing on equipping young people with skills that match market needs (Hakizayezu, 2022). As part of Vision 2050, the government has committed substantial resources to develop TVET, aiming to foster a knowledge-driven economy (Aboelezz, 2021). By concentrating on sectors with high demand, TVET helps close the skills gap, preparing graduates with the abilities that employers actively seek. The emphasis on practical training ensures participants gain real-world experience that strengthens their employability and entrepreneurial potential (Caria et al., 2024).

Key TVET initiatives focus on sectors such as construction, hospitality, and information technology, where demand for skilled workers is high (Rwanda Development Board, 2022). Aligning training with industry requirements helps bridge the gap many young jobs seekers face, enhancing their chances of employment and creating opportunities for self-employment (Ndagijimana et al., 2018). For example, skilled labor in construction is essential for Rwanda's ongoing infrastructure projects, while the expanding tourism industry requires well-trained personnel in hospitality. By concentrating on these growth sectors, TVET not only improves employment outcomes for graduates but also contributes to the broader goals of national economic development (Neupane, 2011).

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1.1 Statement of the Problem

Continuous curriculum revisions are essential to keep TVET programs aligned with labor market needs (Hakizayezu, 2022). While many TVET graduates in Rwanda achieve self-employment, others face barriers like limited startup capital, insufficient entrepreneurial skills, family constraints, and market competition (World Bank, 2019). TVET was introduced strategically to address youth unemployment and job creation (Onwe, 2013). In Rusizi District, youth self-employment promotes economic independence, job creation, sustainable development, and innovation. These factors inspired this study.

1.2 Research Objectives

i. To examine the type of jobs created by TVET Graduates in the Rusizi district;
ii. To examine the contribution of TVET Graduates to job creation in Rusizi District;
iii. To find out the relationship between TVET and job creation in Rusizi District.

1.3 Research Questions

i. What are the types of jobs created by TVET Graduates in the Rusizi district?
ii. What is the contribution of TVET Graduates to job creation in Rusizi District?
iii. Is there any relationship between TVET and job creation in Rusizi District?

II. LITERATURE REVIEW

2.1 Theoretical Review

This section presents the theoretical review such as Search-matching Theory, Human Capital Theory, and Lifelong Learning Theory.

2.1.1 Search-Matching Theory

Search-matching theory emerged in the 1960s and 1970s, primarily through the pioneering work of George Stigler in 1961, which laid the groundwork for search theory. This foundational concept was further developed in the 1970s by notable economists John McCall and Dale Mortensen. The theory evolved into a modern framework known as the Diamond-Mortensen-Pissarides (DMP) model, formulated by Peter Diamond, Dale Mortensen, and Christopher Pissarides during the late 1970s and early 1980s (Rosén, 1997).

According to Rosholm and Svarer (2004) Search-Matching Theory emphasizes the importance of reducing the time it takes for workers and firms to connect, suggesting that this reduction is a key factor in job creation. The theory highlights the dynamics of the labor market, where efficient matching processes can lead to increased employment opportunities. In the study by Malgonde et al. (2020) explores the complexities inherent in search matching theory, particularly within the context of two-sided recommender systems on digital platforms. The authors emphasize the importance of understanding the interactions between users and providers in these systems, as they significantly influence the effectiveness of recommendations. The research highlights the challenges posed by the dynamic nature of user preferences and the diverse offerings available on digital platforms.

Further, the study by Chen (2025), the application of deep reinforcement learning (DRL) within a search-matching model is explored to analyze labor market fluctuations. The research highlights how DRL can effectively simulate and predict the dynamics of job search and matching processes, providing insights into the behavior of both employers and job seekers.

Search-Matching Theory is important to this study as it suggests that the efficiency of the job market is significantly influenced by the time it takes for workers and firms to connect. When this matching process is expedited, it leads to an increase in job creation (Rosholm & Svarer, 2004). The theory emphasizes the importance of reducing barriers and improving mechanisms that facilitate the interaction between job seekers and employers. Additionally, this theory helped the researcher to underpin theexamining the jobs created by TVET Graduates in the Rusizi district.

2.1.2 Human Capital Theory

The human capital theory was originally submitted by economists Theodore Schultz and Gary Becker during the 1960s; however, it can be dated to Adam Smith during the 18th century. Theodore Schultz made the point that education and training should be regarded as a necessary investment in economic growth and not as social benefits. He came up with the concept of human capital that he defined as skills and knowledge that people have, which play a big role in production processes. Abdeldayem et al. (2021) noted that the human capital is very essential in improving productivity and economic growth. The contribution of human capital theory is to create the basis of the economic worth of investment in education and training and the significance of it on individual and societal progress.

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Yaqoob et al. (2022) study offered a critical examination of the human capital theory applied in the education field within a span of fifty years, 1971-2021. The authors discussed the development of the human capital theory by highlighting its importance in educational policy and practice formulation. They emphasized the premise of the theory that education improves the productivity and growth of an individual economy, which underlines the significance of investing in human capital.

Further, Rafid (2023) discussed the complex connection between the human capital theory and education. Author highlighted that the human capital theory assumes education to be one of the most important investments that improve the productivity and economic development of individuals. This focuses on how education leads to not just the provision of individuals with the necessary skills and knowledge, but also the overall benefits of society, in the context of enhanced innovation and better health among the population.

The human capital theory is meaningful to this study as it posits that education, training, and health are vital investments that enhance productivity and earning potential for individuals and society (Saha et al., 2025). Pioneered by economists such as Theodore Schultz and Gary Becker, the theory equates skills and knowledge to forms of capital that can be accumulated, similar to physical capital, to generate economic returns. This accumulation of human capital is linked to increased innovation, economic growth, and higher earnings for individuals. Abdeldayem et al. (2021) noted that the theory emphasizes that investing in human development through education and job training is essential for achieving both personal success and national prosperity. Additionally, the human capital theory was help the researcher to explain the contribution of TVET Graduates to job creation in Rusizi District.

2.1.3 Lifelong Learning Theory

The lifelong learning theory was first comprehensively defined by Basil Yeaxlee in 1929. It was an underlying theory that received a lot of momentum when UNESCO supported the theory in their 1972 report, Learning to Be. Lifelong learning was outlined as the master concept of the educational policies in this report, and its significance in the formation of educational frameworks and approaches was noted. According to Gouthro (2022) lifelong learning theory refers to the perpetual acquisition of knowledge and skills in a lifetime and is required to stay competitive in a dynamic job market because of its contribution in skills formation, flexibility and innovation. This is a life long process of developing skills which ensures that people and organizations will be able to adapt to any technological changes and changes in the market.

The paper by Tamas et al. (2024) discussed the importance of lifelong learning theory in terms of improving competitiveness in the labor market. It underlines that lifelong learning and upgrading of skills are important in enabling one to keep in pace with the fast-evolving workplace environment. The authors claim that lifelong learning is not only an individual benefit to the career development, but also leads to the economic evolution in general since it creates a more qualified labor force. Further, a study by Eppler-Hattab (2022) focused on the discussion of the transition to lifelong learning theory to self-employment in old age and the implementation of the latter in the case of Israel. The paper highlighted the significance of lifelong learning theory as a key element to older adults who want to engage in entrepreneurial practices. It brings out the importance of lifelong learning and constant improvement of skills that can help one overcome the challenges of self-employment in later years.

This theory is important to this study as it emphasizes the ongoing acquisition of knowledge and skills throughout an individual's life. This continuous learning process is crucial for maintaining competitiveness in a dynamic job market. It plays a significant role in skill development, enabling individuals to adapt to technological advancements and shifting market demands (Gouthro, 2022). By fostering adaptability and innovation, lifelong learning ensures that both individuals and organizations remain relevant and capable of meeting the challenges posed by an ever-evolving landscape (Tamas et al., 2024). Moreover, this theory was helpful in explanation the relationship between TVET and job creation in Rusizi District.

2.2 Empirical Review

This empirical review is based on following objectives: To examine the type of jobs created by TVET Graduates in the Rusizi district; to examine the contribution of TVET Graduates to job creation in Rusizi District; and to find out the relationship between TVET and job creation in Rusizi District.

2.2.1 Examining the Types of Jobs Created by TVET Graduates

TVET helps to create jobs and leads to economic growth within a community especially through promotion of entrepreneurship. Such a pathway not only eases unemployment rates but also facilitates wider development, and that is why TVET is an important element of the economic plan (Dagar & Yadav, 2016).

Abdullah et al. (2024) stated that career selection significantly impacts an individual's professional trajectory, particularly in the technical sector, where notable gender differences exist. A study conducted among TVET graduates in Malaysia utilized a questionnaire to explore these differences and other influencing factors such as personality,

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interest changes, obstacles, salary, and career prospects. The research involved a quantitative approach, surveying 246 randomly selected students from various institutions, including Community Colleges and Polytechnics, using a validated instrument based on the ROSS Career Selection Model. The analysis revealed that 56% of participants were employed in their field of study, while 44% were not. Statistical tests indicated no significant gender differences in career involvement among TVET graduates, with a t-test value of 0.856 and a p-value of 0.394. However, a one-way ANOVA test showed significant differences in career selection based on the type of institution, with a p-value of 0.010. These findings offer valuable insights for management to better support TVET graduates in their career choices within the technical sector. The study focused on career selection, an individual's professional trajectory, and TVET graduates.

Besides these positive findings, there are still some challenges in the context of the Rwanda TVET. Other problems have to deal with quality of training and the lack of good training facilities linked to scarcity of qualified teachers (Jagielska-Burduk et al., 2021). It is also widely known that vocational education is socially stigmatized, as these programs are treated as less prestigious in comparison with academic-oriented programs, which deters young people (International Labor Organization, 2018). There are also monetary obstacles that restrict the range and success of TVET (Ndagijimana et al., 2018). No proper infrastructure and resources interfere with the learning experiences in a negative way to the outcomes. In addition, the current negative attitude limits the involvement and the overall effect of TVET. These issues have to be overcome to unlock the potential of TVET in addressing the unemployment issue among young people (Damayanti, 2022).

Further, the study conducted by Sibiya and Nyembezi (2018) investigates the factors influencing Technical Vocational Education and Training (TVET) engineering students' perceptions of their career choices. Utilizing qualitative self-administered, open-ended questionnaires, the researchers collected data on students' beliefs, feelings, and experiences related to engineering programs and services at TVET colleges. A purposive sampling method was employed, involving 113 engineering participants who voluntarily completed the questionnaires. The findings revealed a significant divergence in student opinions regarding the employment prospects associated with TVET engineering qualifications. Some students expressed strong confidence that these qualifications lead to full employment due to the high demand for engineering skills. Conversely, others highlighted the pervasive unemployment crisis in South Africa, arguing that even graduates with qualifications face substantial challenges in securing employment. The study was limited on TVET's learning programmes, labour market, self-employment.

Moreover, according to Ehrlin and Gustavsson (2018), parental participation in TVET colleges is very important in increasing student performance. In this regard, according to Ntekane (2018), active involvement of parents establishes a supportive environment, which encourages learners to do their best in order to bring pride to their families. To support these sentiments, it is notable that constant support during the development of a child cannot be overemphasized (Budiastuti & Suryono, 2015).

2.2.2 Examining the Contribution of TVET Graduates to Job Creation

The studies suggest that TVET alumnus usually faces a better employment rate than peers who receive a more classical education. These studies show that graduates of Technical and Vocational Education and Training (TVET) programs have higher chances of getting jobs than their counterparts who take conventional academic education. This observation demonstrates the usefulness of TVET in preparing people with hands-on skills that are required in the labor market. The focus on practical training and industry-related skills seems to be a more employable factor, which implies that TVET can be a more appropriate channel to get a job in some areas (Boateng et al., 2024).

Selane and Odeku (2024) conducted a study highlighting the significant role of Technical Vocational Education and Training (TVET) in enhancing students' skills and competencies in South Africa. The research underscores that TVET is crucial for the economy and society, serving as a transformative tertiary educational institution aligned with the South African government's developmental strategies. It provides an alternative pathway for learners who do not gain university admission, enabling them to acquire skills that enhance employability, foster self-employment, and promote job creation. The study was limited on Technical Vocational Education and Training and enhancing students' skills and competencies.

To enhance the role of TVET in self-employment of the youths, some recommendations should be taken into consideration. It is essential to ensure that training remains economic related to industries by creating effective partnerships with industry between TVET institutions and the immediate state (Tusiime et al., 2024). Through such partnerships, students can gain experience through their internships and apprenticeships, as well as understand what the labor market wants, as the organization will be able to provide the answers. In addition, the society needs to be sensitized on changing its collective beliefs about TVET to make it appear as a viable and valid career choice (Dagar & Yadav, 2016). Such campaigns are expected to use social media and professional networks to bring out success stories that would create confidence that TVET has the power to provide promising futures (Amin et al., 2023). Those studies focused on role of TVET in self-employment of the youths, labor market, valid career choice.

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2.2.3 Finding the Relationship between TVET and Job Creation

TVET provides business management training, through which the graduates launch their own business (Shikalepo, 2019). It is stated by many that the practicality of their education has a direct positive impact on their work or entrepreneurial activities, increasing confidence and chances of success (Ndagijimana et al., 2018). Murgor (2013) conducted a study examining the relationship between skills acquired through technical and vocational education and training and the skills demanded by the job market in Uasin Gishu County, Kenya. The research aimed to evaluate how well the skills taught in TVET align with employer expectations. Data was collected through questionnaires distributed to 200 former graduates of TVET programs. The findings revealed that certain skills provided by TVET, such as interpersonal skills, personal qualities, numerical data usage, critical analysis, teamwork, and practical experience, fell short of job market requirements. The study concerned relationship between technical and vocational education and training and the job market.

Further, the study conducted by Fatokun (2024) investigates the impact of entrepreneurship education on job creation among graduates of Technical, Vocational Education and Training colleges in Ekiti State, Nigeria. Utilizing a descriptive research design, the research focused on a population of 4,176 students from three technical colleges, with a sample size of 365 selected through simple random sampling. The analysis employed descriptive statistics, including mean and standard deviation, alongside inferential statistics through linear regression to address the research questions and test hypotheses. The findings indicate a significant positive effect of entrepreneurship education on the self-productivity of TVET college students on job creation.

Technical and Vocational Education and Training plays a crucial role in job creation, demonstrating a strong and statistically significant relationship with employment outcomes (Tusiime et al., 2024). By equipping individuals with practical and industry-relevant skills, TVET enhances employability and fosters self-employment and entrepreneurship opportunities (Sibiya & Nyembezi, 2018). Furthermore, it effectively addresses the skills gap in the labor market, aligning the competencies of the workforce with the demands of various industries. According to Jagielska-Burduk et al. (2021) this alignment not only benefits individuals seeking employment but also supports economic growth by ensuring that businesses have access to a skilled labor pool.

III. METHODOLOGY

3.1 Description of the Study Area

According to Uwamahoro et al. (2023) Rusizi District is situated in the southwestern part of Rwanda, within the Western Province. It shares its southern border with Burundi and its western boundary with the Democratic Republic of the Congo (DRC). The Rusizi River, which rises in Lake Kivu and empties into the DRC, is the source of the district's name. Geographically, the western portion of Nyungwe Forest, a popular tourist destination, is included in Rusizi District. Most of the land is mountainous in the east and hilly in the west.

Climatically, the district experiences a moderate climate with an average temperature of 17∘C. The average annual rainfall is 1,391 mm, with March being the wettest month and July the driest (Rwanyiziri et al., 2019). Economically, Rusizi District boasts rich agricultural land, producing goods for neighbouring countries. It is a significant exporter of perishable foods, beverages, minerals, construction materials, and manufactured goods.

3.2 Research Design

Abutabenjeh and Jaradat (2018) defines research design as the overall process of analysing the components of a problem by sharing the resulting findings. It can also refer to a visual model illustrating the relationship between independent and dependent variables. In this study, a descriptive research design and correlational research design were chosen. The main goal of descriptive research is to offer an accurate and reliable portrayal of the variables or factors pertinent to the research questions, while, the correlational research is to determine the relationship between two variables. This study also utilised combined approaches, incorporating both quantitative and qualitative approaches.

3.3 Population

Sakaue et al. (2021) describe a population as the complete set of items or subjects to which research applies. Likewise, Lee (2023) defines it as a group of people, animals, or objects sharing one or more characteristics and representing the focus of the study. For this research, the target population consists of 258 self-employed youth who have experience with the impact of TVET on youth self-employment.

3.4 Sample Size and Sampling Technique

According to Serdar et al. (2021), sample size refers to a smaller group or subgroup derived from the available population. For this study, the researcher utilised a model developed by Yamane in 1967, which was deemed appropriate

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for determining the sample size (Lamola & Yamane, 1967). This yielded a sample size of 72 respondents who participated in the primary data collection, as calculated using the Yamane formula:

n=N/(1+N(e)2)

Where:

N: Represents the target population

n: Represents the sample size

e: Represents the precision level of the accuracy level, and it is fixed at 0.1

The sample size was calculated based on the above formula.

The current study

N equal 258 tapayers

e equal 0.1

n=258/(1+(258*0.1*0.1))=72.06

n=72 respondents

3.5 Research Instruments

Abutabenjeh and Jaradat (2018) highlights three primary methods for collecting data from or about individuals. In line with this, the study utilised a survey approach that included interview guide and questionnaire. Sakaue et al. (2021) defines a questionnaire as a collection of written questions that respondents answer, either by themselves or with assistance from an organisation. In this study, questionnaires were carefully designed and pre-tested before being distributed to the chosen participants. The tool consisted of a series of related questions arranged in a particular sequence to make responding easier. Further, Lee (2023) described an interview as a conversation between an interviewer (or group of interviewers) and the interviewee. The researcher employed this technique for the study. Administrative officials closely involved with youth self-employment were interviewed to obtain additional evidence and perspectives relevant to the study.

3.6 Data Analysis Methods

In this research, quantitative and qualitative data were used. Upon the organisation, editing, and coding of the quantitative data, descriptive statistics, Pearson correlation, and multiple regression analysis were used to conduct an analysis. The descriptive analysis and regression analysis have used. The regression analysis was used to understand the relationship between TVET variables and job creation, whereby the following model was used:

Job creation=β0+β1(TVET Skills) +β2 (Job placement) +β3 (Entrepreneurship)+ β4 (Productivity)+ e

Where:

Job Creation = the number of jobs created (dependent variable)

TVET Skills = Occupation-specific skills training (IV)

Job Placement = accelerated integration into labor market (independent variable)

Initiation of businesses = Business start-up support (independent variable)

Productivity = Worker/business productivity (independent variable)

β_0 = Intercept

β_1-β_4 = Regression coefficients

ε = Error term

IV. FINDINGS & DISCUSSION

4.1 Findings

Presenting experimental results through graphs, charts, and tables serves two main purposes. First, it offers a visual means to examine the data, understand outcomes, and draw interpretations. Second, it's typically the most effective way to communicate data to others. In this chapter, I'll first categorise the demographic characteristics of the respondents, then address questions related to the research objectives.

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Table 1

Profile of Respondents

Distribution of respondents by gender		
Respondents	**Frequency**	**Percentage (%)**
Male	37	51
Female	35	49
Total	**72**	**100%**
Distribution of Respondents by Age		
Age of respondents	**Frequency**	**Percentage (%)**
16-20	45	62.5%
21-25	16	22.2%
More than 26	11	15.3%
Total	**72**	**100%**
Education level of youth self-employment		
Types of degrees	**Frequency**	**Percentage (%)**
Diploma (A2	43	60%
Advanced degree	25	35%
Bachelor's degree	4	5%
Total	**72**	**100%**
Marital status of respondents		
Respondents	**Frequency**	**Percentage (%)**
Single	49	68%
Separated	0	0%
Married	23	32%
Divorced	0	0%
Total	**72**	**100%**

Table 1 indicates findings profile of respondents. The respondents' profile in this study reveals a fairly even distribution between genders, with 51% male and 49% female participants. In terms of age, the majority are young, with 62.5% falling between 16-20 years and 22.2% aged 21-25 years, demonstrating a focus on the youth demographic in Rusizi District's self-employment sector. Educational qualifications among respondents primarily include a Diploma (A2) held by 60%, followed by 35% with an advanced degree and 5% with a bachelor's degree. Regarding marital status, 68% of the respondents are single, while 32% are married.

4.3 The type of jobs created by TVET Graduates in the Rusizi district

This section examines the various employment opportunities available to Technical and Vocational Education and Training (TVET) graduates in Rusizi District.

Table 2

The Type of Jobs Created by TVET Graduates in the Rusizi District

Statements	**SA**	**%**	**A**	**%**	**N**	**%**	**D**	**%**	**SD**	**%**
Is there Painting and Decoration?	11	15.1	54	79.5	2	2.5	2	2.5	1	1.4
Is there shoe-making?	2	2.9	59	86.7	0	0	5	7.3	2	2.9
Is there Masonry?	7	10.2	60	88.2	0	0	1	1.4	0	0
Is there lumbering?	5	7.3	58	85.2	3	4.4	0	0	2	2.9
Is there machinery operation?	9	13.2	56	82.3	2	2.9	0	0	1	1.4
Is there Carpentry?	2	2.9	59	86.7	1	1.4	4	5.8	2	2.9

Table 2 clearly showcases the variety of jobs created by Technical and Vocational Education and Training (TVET) graduates in Rusizi District, indicating their significant presence across multiple sectors. A significant majority of respondents, 95.5%, indicated the availability of Painting and Decoration jobs (15.1% Strongly Agree, 79.4% Agree). Similarly, shoe-making is highly prevalent, with 89.6% (2.9% Strongly Agree, 86.7% Agree) affirming its existence. Masonry also demonstrates strong representation, with 98.4% (10.2% Strongly Agree, 88.2% Agree) agreeing to its presence. Furthermore, Lumbering was indicated by 92.5% (7.3% Strongly Agree, 85.2% Agree) of respondents, while Machinery Operation was reported by 95.5% (13.2% Strongly Agree, 82.3% Agree). Finally, Carpentry jobs are widely acknowledged by 89.6% (2.9% Strongly Agree, 86.7% Agree) of the respondents, collectively highlighting the diverse skills TVET graduates are translating into employment opportunities within the district. The results coincide with those of Pongo (2014), who insisted that practice-oriented TVET projects are affordable to real-world needs and generate

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employment opportunities on a long-term basis. Similarly, Afandi (2019) opined that informal work in emerging economies has been gaining prominence, with young TVET graduates leading most of the entry-level and self-employment opportunities in the countries.

Table 3

TVET Graduates' Role in Creating Jobs in Rusizi District.

Statements	SA	%	A	%	N	%	D	%	SD	%
Are there in-demand skills?	8	12.1	56	82.1	0	0	4	5.8	0	0
Are there start-ups?	3	4.4	60	88.2	0	0	3	4.4	2	2.9
Does it promote entrepreneurship?	5	7.3	62	91.1	0	0	1	1.4	0	0
Do their pilot programs diversify economies?	2	2.9	58	85.2	3	2.9	5	7.3	0	0
Is there support for economic development?	7	10.2	58	85.2	2	2.9	0	0	1	1.4

There is widespread consensus on the positive impact that Technical and Vocational Education and Training (TVET) graduates have on job creation in Rusizi District, as shown in Table 3. According to a noteworthy 95.5% of respondents, TVET graduates gain in-demand skills (12.1% Strongly Agree, 82.1% Agree). Likewise, 92.6% of respondents (4.4% Strongly Agree, 88.2% Agree) agreed that these graduates start their own firms, which directly contributes to the creation of jobs. Additionally, 98.4% of respondents (7.3% Strongly Agree, 91.1% Agree) concurred that TVET graduates actively encourage business in the district.

The data also shows that 88.1% (2.9% Strongly Agree, 85.2% Agree) believe TVET graduates help diversify the local economy, while 95.4% (10.2% Strongly Agree, 85.2% Agree) confirmed their role in supporting overall economic development. Qualitative data from interviews reinforced these findings. For example, one TVET graduate (Youth A) reported employing two fellow graduates in their masonry business, illustrating direct job creation. Another interviewee (Youth B), who operates a catering service, highlighted their role in providing flexible, part-time employment opportunities for community members. These testimonies further underscore the multifaceted impact of TVET graduates on employment and economic growth in Rusizi District. This confirms the findings of Tusiime et al. (2024), who stressed that employers consider Rwandan TVET graduates to be the ones who can contribute to their business through their entrepreneurial spirit, skills, and motivation. It also follows the claim of Shikalepo (2019) that TVET not only serves to acquire skills, but it also enhances independence and entrepreneurship among the young population.

Table 4

The relationship between TVET and job creation in Rusizi District

Statements	SA	%	A	%	N	%	D	%	SD	%
Provides occupation-specific skills	7	10.4	57	83.8	0	0	4	5.8	0	0
Helps people get jobs faster	3	4.4	58	85.2	0	0	5	7.3	2	2.9
Helps address skills shortages	6	8.8	61	89.7	0	0	1	1.4	0	0
Helps people start businesses	5	7.3	59	86.7	2	2.9	0	0	2	2.9
Improve the productivity of workers and businesses.	9	13.2	56	82.3	2	2.9	0	0	1	1.4

As illustrated in Table 4, there is a strong correlation between Technical and Vocational Education and Training (TVET) and job creation in Rusizi District, and respondents generally agreed that TVET is essential for promoting employment. A significant 95.5% of respondents (10.4% Strongly Agree, 83.8% Agree) confirmed that TVET gives people the job-specific skills they need. TVET's effectiveness in meeting labour market demands is further demonstrated by the 89.6% of respondents who agreed (4.4% Strongly Agree, 85.2% Agree) that it speeds up integration into the workforce.

Furthermore, TVET successfully tackles skills shortages, guaranteeing the availability of knowledge within the local labour market, according to 98.5% (8.8% Strongly Agree, 89.7% Agree) of respondents. Additionally, according to the research, 94% of respondents (7.3% Strongly Agree, 86.7% Agree) think that TVET encourages entrepreneurship by empowering people to launch their own companies. Furthermore, 95.5% of respondents (82.3% Agree, 13.2% Strongly Agree) stated that TVET increases worker and corporate productivity. Together, these results show how TVET has a major and diverse influence on economic growth and job creation in Rusizi District.

This conclusion is further supported by interview data. A number of TVET graduates, including Youth A, B, C, and D, highlighted how their training gave them the market knowledge, practical skills, and self-assurance they needed to spot business opportunities, launch businesses, and add jobs in their communities. These first-hand stories demonstrate the clear connection between TVET and successful entrepreneurship, establishing graduates as essential players in the local economy.

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The findings of this study align with those reported by Lema (2024), who discovered a close relationship between employment and the TVET system, particularly when it comes to retraining to keep up with the quick changes in technology. It also aligns with Lamichhane's (2013) research, which distinguished two main systems in secondary vocational education: a workplace-based system in which students gain technical skills through hands-on apprenticeships, and a school-based system that follows national curricula while providing students with exposure to the labour market.

Table 5

Regression Coefficients

Variable	Coefficient	Std. Error	t-value	p-value
(Constant)	0.842	0.311	2.707	0.009
TVET Skills	0.387	0.092	4.207	0.000
Job Placement	0.215	0.087	2.471	0.016
Entrepreneurship	0.452	0.078	5.795	0.000
Productivity	0.194	0.085	2.282	0.026

Results from the multiple regression analysis, as indicated in Table 5, reveal a strong and statistically significant relationship between various TVET components and job creation outcomes among youth. The model explains approximately 78.3% of the variance in job creation ($R^2 = 0.783$), indicating a robust explanatory power.

All predictors included in the model, TVET skills training, job placement programs, entrepreneurship education, and productivity enhancement, are statistically significant contributors to job creation ($p<0.05$). Among these, entrepreneurship training emerges as the most influential factor, with the highest standardised coefficient ($\beta=0.452$, $p<0.001$). This highlights the critical role of entrepreneurial education in empowering youth to initiate and manage their own ventures.

Likewise, VET skills training ($\beta=0.387$, $p<0.000$) also has a strong positive effect, underlining the importance of hands-on technical competencies in enabling young people to secure or create employment. Further, job placement support ($\beta=0.215$, $p=0.016$) and productivity training ($\beta=0.194$, $p=0.026$) both show moderate yet statistically significant contributions, emphasising the complementary roles of institutional linkages and efficiency-focused training in fostering employment outcomes. These findings not only reinforce Hakizayezu (2022) argument on the evolving role of TVET in dynamic labour markets but also extend prior research by offering a quantitative comparison of the relative impacts of different program components. The findings indicate that some aspects of TVET are of great value, but to optimise the effect on employment among youth, one should ensure that emphasis is laid on entrepreneurship education when designing the policies and programs.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

In this study, which was conducted between 2021 and 2023, Technical and Vocational Education and Training (TVET) in the Rusizi District of Rwanda, as a contributor to popularising self-employment among younger generations, is evaluated. The researcher, whose interests were scholarly driven, investigated to establish the types of TVET programs being provided, as well as the type of occupations that TVET graduates, and the contribution of TVET and linkage of TVET and job development in the region. Those findings provide valuable information to TVET institutions, investors in SMEs, and policymakers in Rwanda to develop strategies to improve the rate of self-employment among youths and to address the current issues and formulate effective policies. Under a descriptive research design, the study used a questionnaire as a primary source of data, and 72 self-employed youths were used as respondents. Descriptive statistics and Pearson correlation were utilised to analyse the data and shed some light on the correlation between participation in TVET programs and the outcomes in self-employment. In this regard, the The study concludes that there is the impact of Technical and Vocational Education and Training (TVET) on youth self-employment in Rwanda. specifically, the study found that painting & decoration, shoes-making, masonry, lumbering, machinery operation, carpentry jobs were types of job created. In addition, it concludes that TVET contribute to the training skills, creation of owner firms, business encouragement, helping diversify local economy. Finally, it concludes that there is relatiosnhips between TVET and job creation in Rusizi district.

5.2 Recommendations

These proposals are meant to utilise the findings of this research in order to implement the role of TVET in boosting youth self-employment in the Rusizi District of Rwanda. TVET programs should be highly tuned towards local market demand in order to facilitate the effective promotion of youth self-employment in Rusizi District, which should

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be through constant assessment of skill gaps. There should be periodic curriculum revision whereby, with the changes in opportunities in specific key sectors such as construction, manufacturing, tourism, and agriculture, the graduates should acquire relevant skills that are in demand. In addition, the incorporation of comprehensive training on entrepreneurship that encompasses skills on business planning, financial management, marketing, and legal issues, as well as practical workshops and mentorship opportunities into all TVET packages, will be very useful in enhancing the capacity of young entrepreneurs to succeed.

In order to actualise the optimisation of youth self-employment in Rusizi District, the TVET program should be highly linked to local market demands by constantly assessing the skills gap. Emerging trends in opportunities available in crucial sectors such as construction, manufacturing, tourism, and agriculture should be included in the curriculum regularly, hence ensuring that graduates acquire relevant skills that are required and in demand. Furthermore, integrating a comprehensive entrepreneurship skills program to encompass skills like business planning, financial management, marketing, and taking the law into account, and running workshops and mentorship programs in all TVET training will go a long way to enhancing the capacity of young entrepreneurs to succeed.

The policymakers are advised to improve investment in TVET facilities and resources rather than to allocate finances to improve facilities, equip facilities with modern facilities as well as hire qualified instructors. These gains will boost the quality of training and prepare the youth in a better way to face the market with quality self-employment. Concurrently, there have to be policies to encourage youth entrepreneurship, such as putting in place accessible financing mechanisms, a simplification of the business registration process, and providing taxation incentives. Also, a solution would be to develop incubators or co-working spaces that specifically cater to graduates of TVET and, in the process, stimulate startup growth and innovation. Finally, TVET can encourage raising the awareness of the benefits of TVET as a part of the targeted campaigns that would aid in changing the societal perception and underline its self-employment and economic growth potentials, in addition to increasing youth involvement and gaining a wider acceptance of the society. To succeed in self-employment, youth should actively seek mentorship and expand their professional networks, engage in continuous learning to stay aligned with changing market demands, and strategically target niche markets and innovative opportunities. This approach empowers them to build sustainable businesses that effectively address unmet needs within their communities.

REFERENCES

Abdeldayem, M. M., Aldulaimi, S. H., & Kharabsheh, R. (2021). Development of human capital resources to increasing economic growth and innovation in the GCC Countries. *International Journal of Green Management and Business Studies*, *1*(1), 62-79.

Abdullah, H., Malik, N. A., & Nasuka, S. N. (2024). Factors Influencing the Involvement of TVET Graduates in Career Selection in the Technical Sector in Malaysia. *Politeknik & Kolej Komuniti Journal of Social Sciences and Humanities*, *9*(2), 93-102.

Aboelezz, N. A. (2021). Impact of knowledge economy on economic growth in Rwanda: An empirical study during the period (2000-2019). *Science Journal for Commercial Research*, *43*(4), 10-30.

Abutabenjeh, S., & Jaradat, R. (2018). Clarification of research design, research methods, and research methodology: A guide for public administration researchers and practitioners. *Teaching public administration*, *36*(3), 237-258.

Amin, S. M., Suhaimi, S. S. A., & Nazuri, N. S. (2023). The present and future of Malaysian technical and vocational education and training (TVET). *International Journal of Academic Research in Business and Social Sciences*, *13*(18), 107-117.

Afandi, S. A. (2019). Development frameworks of the Indonesian partnership 21st-century skills standards for prospective science teachers: A Delphi study. *Jurnal Pendidikan IPA Indonesia*, *8*(1), 89–100.

Boateng, C., Ackon, F., & Nyarko, I. K. (2024). Factors Influencing Students' Choice of Technical and Vocational Education and Training (TVET) Pathway in the Central Region of Ghana. *African Journal of Empirical Research*, *5*(4), 1826-1838.

Budiastuti, E., & Suryono, Y. (2015). Asesmen Karakter Kerja Pendidikan Vokasi. *Prosiding Pendidikan Teknik Boga Busana*, *10*(1), 1-9.

Caria, S., Orkin, K., Andrew, A., Garlick, R., Heath, R., & Singh, N. (2024). Barriers to search and hiring in urban labour markets. *VoxDevLit*, *10*(1), 1-46.

Chen, R. (2025). Deep Reinforcement Learning in a Search-Matching Model of Labor Market Fluctuations. *Economies*, *13*(10), 1-16.

Dagar, V., & Yadav, A. (2016). Constructivism: A paradigm for teaching and learning. *Arts and Social Sciences Journal*, *7*(4), 1-4.

Licensed Under Creative Commons Attribution (CC BY-NC)

Damayanti, L. S. (2022). Pengembangan Media Pembelajaran Interaktif Berbasis Augmented Reality Pengenalan Perangkat Keras Komputer. Ikra-Ith Informatika: *Jurnal Komputer dan Informatika*, *6*(1), 10-19.

Ehrlin, A., & Gustavsson, H. O. (2018). El Sistema as an Opportunity for Collaboration between School and Home–Parents' Perspectives on an El Sistema-Inspired Activity. *International Journal of Learning, Teaching and Educational Research*, *17*(8), 36-55.

Eppler-Hattab, R. (2022). From lifelong learning to later life self-employment: a conceptual framework and an Israeli enterprise perspective. *Journal of Enterprising Communities: People and Places in the Global Economy*, *16*(6), 948-966.

Fatokun, J. O. (2024). Entrepreneurship Education as a Correlate of Job Creation among Technical, Vocational Education and Training (TVET) College Graduates in Ekiti State, Nigeria. *ATBU Journal of Science, Technology and Education*, *12*(2), 784-792.

Goulart, V. G., Liboni, L. B., & Cezarino, L. O. (2022). Balancing skills in the digital transformation era: The future of jobs and the role of higher education. *Industry and Higher Education*, *36*(2), 118-127.

Gouthro, P. A. (2022). Lifelong learning in a globalized world: The need for critical social theory in adult and lifelong education. *International Journal of Lifelong Education*, *41*(1), 107-121.

Hakizayezu, J. D. D. (2022). *Challenges facing technical and vocational education and training institutions on youth employment in Rwanda: a case of study of Gasabo district* (Doctoral dissertation, College of Education, University of Rwanda,).

International Labour Organisation (ILO). (2018). *Skills for tourism*: A guide for TVET providers. Geneva: International Labour Organisation.

Jagielska-Burduk, A., Pszczyński, M., & Stec, P. (2021). Cultural heritage education in UNESCO cultural conventions. *Sustainability*, *13*(6), 1-15.

Kawuki, J., Gatasi, G., & Sserwanja, Q. (2022). Prevalence of adequate postnatal care and associated factors in Rwanda: evidence from the Rwanda demographic health survey 2020. *Archives of Public Health*, *80*(1),1-11.

Lamichhane, R. (2013). Strategic directions for CTEVT for skilling Nepal. *TVET Development Journal*, *1*(13), 14-22.

Lamola, A. A., & Yamane, T. (1967). Sensitized photodimerization of thymine in DNA. *Proceedings of the National Academy of Sciences*, *58*(2), 443-446.

Lawal, A. W. (2019). Technical and vocational education, a tool for national development in Nigeria. *Mediterranean Journal of Social Sciences*, *4*(8), 85-91.

Lee, S. Y. (2023). The 2023 Outlook for Population Policy. In *Health and welfare policy forum 1* (1), 63-76.

Lema, A. (2024). *Exploring Management Practices of Technical Education and Training Institutions in Developing Soft Skills for Self-Employment Among Learners in Tanzania* (Master's thesis, University of Dodoma (Tanzania)).

Malamud, O., & Wetzels, R. (2021). General education versus vocational training: Evidence from an economy in transition. *Review of Economics and Statistics*, *92*(1), 43-60.

Malgonde, O., Zhang, H., Padmanabhan, B., & Limayem, M. (2020). Taming complexity in search matching: Two-sided recommender systems on digital platforms. *Mis Quarterly*, *44*(1), 49-84.

Martínez-Fernández, C., & others. (2023). Skills development pathways in Asia. *In Skill development for inclusive and sustainable growth in developing Asia-Pacific 1* (1) 155-179

Murgor, T. K. (2013). Relationship between technical and vocational acquired skills and skills required in job market; evidence from TVET institutions, Uasin Gishu County, Kenya. *Journal of Education and Practice*, *4*(19), 77-83.

Ndagijimana, J., Nzasingizimana, T., & Heshmati, A. (2018). An analysis of the determinants of youth employment in Rwanda. *UKH Journal of Social Sciences*, *2*(2), 1-10.

Neupane, M. (2011). TVET expenditure: An investment in human capital. *TVET Development Journal*, *1*(11), 88-91.

Njenga, M. (2022). Professional competencies and the continuing professional development needs of Technical, Vocational Education and Training (TVET) teachers in Kenya. *Hungarian Educational Research Journal*, *12*(4), 475-492.

Niwemwiza, E. (2021). *Assessment of the contribution of National Employment Program on unemployment alleviation in youth and women in Rwanda 2014-2018: A case of Rulindo District* (Doctoral dissertation, University of Rwanda).

Ntekane, A. (2018). Parental involvement in education. *Research gate*, *1*(1), 1-9.

Okoth, O. E. (2023). TVET, economy and sustainable development. *International Journal of Vocational and Technical Education*, *15*(2), 12-17.

Onwe, O. J. (2013). Role of informal sector in development of the Nigerian economy: Output and employment approach. *Journal of Economics and Development Studies*, *1*(1), 60-74.

Licensed Under Creative Commons Attribution (CC BY-NC)

Pongo, N. A.-O. (2014). The Impact of TVET on Ghana's Socio-Economic Development: A Case Study of ICCES TVET Skills Training in Two Regions of Ghana. *American International Journal of Contemporary Research*, *4*(1), 185-192.

Porres, G. T., Wildemeersch, D., & Simons, M. (2014). Reflections on the emancipatory potential of vocational education and training practices: Freire and Rancière in dialogue. *Studies in Continuing Education*, *36*(3), 275–289.

Rafid, M. (2023). Relationship analysis and concept of human capital theory and education. *EDUCATUM: Scientific Journal of Education*, *1*(1), 26-31.

Rosén, Å. (1997). An equilibrium search-matching model of discrimination. *European Economic Review*, *41*(8), 1589-1613.

Rosholm, M., & Svarer, M. (2004). Endogenous wage dispersion in a search-matching model. *Labour Economics*, *11*(5), 623-645.

Rwanda Development Board. (2022). *Rwanda Annual State of Skills Supply and Demand*. RDB. Retrieved from https://rdb.rw/files/state-of-Skills-report-2022.pdf, (Retrieved on August 2025).

Rwanyiziri, G., Uwiragiye, A., Tuyishimire, J., Mugabowindekwe, M., Mutabazi, A., Hategekimana, S., & Mugisha, J. (2019). Assessing the impact of climate change and variability on wetland maize production and the implication on food security in the highlands and central plateaus of Rwanda. *Ghana Journal of Geography*, *11*(2), 77-102.

Saha, A., Ali, A. I., Tasrif, A. A., & Khan, N. A. (2025). The impact of human capital on labor productivity and income: an analytical study of education, skills, and workforce attributes. *Pacific Journal of Business Innovation and Strategy*, *2*(1), 34-38.

Sakaue, S., Kanai, M., Tanigawa, Y., Karjalainen, J., Kurki, M., Koshiba, S., ... & Okada, Y. (2021). A cross-population atlas of genetic associations for 220 human phenotypes. *Nature genetics*, *53*(10), 1415-1424.

Selane, C., & Odeku, K. O. (2024). An analysis of how TVET is playing a significant role in fostering students' skills and competencies in South Africa. *Journal of Educational and Social Research*, *14*(3), 293-305.

Serdar, C. C., Cihan, M., Yücel, D., & Serdar, M. A. (2021). Sample size, power and effect size revisited: simplified and practical approaches in pre-clinical, clinical and laboratory studies. *Biochemia medica*, *31*(1), 27-53.

Shikalepo, E. E. (2019). Sustainability of entrepreneurship and innovation among TVET graduates in Namibia. *International Journal for Innovation Education and Research*, *7*(5), 133-145.

Sibiya, A. T., & Nyembezi, N. (2018). Examining factors that shape Technical Vocational Education and Training engineering students' understanding of their career choices. *Transformation in Higher Education*, *3*(1), 1-6.

Tamás, M., Jenei, S., Elena, M., Vasantha, P. L., Malatyinszki, S., & Dávid, L. D. (2024). The role of lifelong learning in labour market competitiveness. *Journal of Ecohumanism*, *3*(8), 7743-7761.

Todd, R., & Dunbar, M. (2018). *Taking a whole of government approach to skills development*. UNESCO Publishing.

Tusiime, M. R., Ndayambaje, I., & Ndihokubwayo, K. (2024). Tracing Rwandan TVET graduates' competences and employability with their potential employers' satisfaction. *Journal of African Research and Developmental Studies*, *1*(1), 1-19.

Yaqoob, S., Ayub, A., Jamal, A., & Nayab, G. I. (2022). A critical analysis of human capital theory in education: Period of 1971 to 2021. *Journal of Education And Humanities Research (JEHR), University of Balochistan, Quetta*, *14*(2), 107-118.

Uwamahoro, B., Munyanshongore, C., Ndagijimana, A., Benemariya, N., Habtu, M., & Ntaganira, J. (2023). Factors associated with severe malaria among patients under reference to district hospitals: A cross-sectional study in Rusizi District, Rwanda. *Rwanda Journal of Medicine and Health Sciences*, *6*(1), 36-42.

Watwana, P. W. (2014). *Regionalism and the movement of labour in the east African community* (Doctoral dissertation, University of Nairobi).

World Bank. (2019). *Technical and vocational education and training (TVET):* A global strategy for lifelong learning. Washington, DC: World Bank Publications.

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Political masculinity and public iconography: An analysis of the autobiographies of Mandela and Obama

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ABSTRACT

This paper examines the world of political masculinities as constructed by autobiographical narratives. It focuses on Barack Obama's Dreams from My Father and Nelson Mandela's Long Walk to Freedom. It also explores the experiences of these two leaders to see how they narrate their life tales, shaping public perceptions and creating iconic identities. This exploration is crucial within their distinct socio-political backgrounds. The aim is to unravel how cultural, social, and political influences have influenced how these leaders define their masculinities from young boys into grown men. The study is guided by Michel Foucault's theory of power and discourse and Judith Butler's theory of gender performativity to dig into the narrative techniques that either push back against or reinforce the hegemonic expectations surrounding Black political masculinity. The results show some tensions between self-representation and what society expects of them, and this gives an insight into how personal stories can be a strategic way to identity formation and political image-making. Furthermore, these narratives function as strategic tools for identity formation and political image-making.

Keywords: Autobiography, Iconography, Performativity, Political Masculinities, Public Construction

I. INTRODUCTION

Political identity is shaped by personal narrative, societal norms, and public perception. Autobiographies of leaders like Barack Obama and Nelson Mandela reflect not only individual journeys but also broader socio-political contexts (Garba & Akuva, 2020; Camille, 2009; Hook, 2013). *Dreams from My Father* and *Long Walk to Freedom* illustrate how political masculinities are formed within distinct cultural and historical frameworks. Obama's narrative, set in post-civil rights America, explores biracial identity and racial tension. On the hand, Mandela's story, rooted in apartheid South Africa, reflects resistance and reconciliation. However, both autobiographies challenge traditional masculinity—often linked to dominance, by presenting leadership grounded in vulnerability, resilience, and moral conviction.

Autobiographies serve as functional tools for constructing public identity. As such, through symbolic elements, speeches, images, and references, Obama and Mandela shape their iconography, reinforcing ideals of strength and integrity. Their narratives also expose power dynamics, asserting agency and fostering collective identity through personal storytelling. While scholars like Gqola (2009) and Lodge (2006) have analyzed Mandela's masculinity, and Cooper (2008) has deconstructed Obama's, a comparative analysis of the autobiographical construction of this masculinity remains underexplored. This paper dives into theories of performance and power. It explores how storytelling contributes identity and how cultural frames leadership. Also, in various settings like the theater or even a corporate boardroom, storytelling can define who people are. More so, this phenomenon emphasizes the importance of narratives in understanding oneself and one role in society.

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Theories of Power, Discourse, and the Performativity of Gender

Smith (2009) suggests that power is intelligible in terms of the techniques through which it is exercised. Many different forms of power exist in society such as legal, administrative, economic, military, and so forth. What they have in common is a shared reliance on certain techniques or methods of application, and all draw some authority by referring

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to scientific truths. Power must be analysed as something which circulates, or rather as something which only functions in the form of a chain. It is never localized here or there, never in anybody's hands, never appropriated as a commodity or piece of wealth. The most important feature of Foucault's theories on power reveals that power is not a thing or a capacity which can be owned either by State, social class or particular individuals. Instead, it is a relation between different individuals and groups and only exists when it is being exercised. Gender performativity is a term first used by the feminist philosopher Judith Butler in her 1990 book *Gender Trouble*. She argues that being born male or female does not determine behavior. Instead, people learn to behave in particular ways to fit into society. The idea of gender is an act, or performance. This act is the way a person walks, talks, dresses, and behaves. She calls this acting "gender performativity." What society regards as a person's gender is just a performance made to please social expectations and not a true expression of the person's gender identity. History validates identity of an individual through the process of repetition. The acts that have been appropriated by the society over the years are bound to greater approximation and acceptance as gender.

2.2 Tracing the Personalities

Mandela is often seen as a conciliatory figure, celebrated globally for his moral leadership, though some South Africans viewed his inclusive politics as controversial. Obama, on the other hand, is shaped by his biracial heritage and upbringing in predominantly white spaces, reflects a hybrid masculinity influenced by multiple cultural norms. Both rose to prominence during transformative moments—Mandela at the end of apartheid, Obama during a shift in U.S. racial politics. Their autobiographies trace their development as leaders, documenting how personal experience informs public identity (Camille, 2009; Hook, 2013; Gqola, 2009). As Nobel Peace Prize laureates and global icons, Mandela and Obama use storytelling to align, or challenge, public expectations of leadership and peace. Their narratives reveal how political masculinities are constructed, negotiated, and symbolically represented in public discourse (Cooper, 2008). These texts allow readers to engage with personal narratives that shape public perception, revealing how political figures use storytelling to define their values and experiences.

Mandela and Obama emerged from racially divided societies, shaped by apartheid, colonialism, and segregation. Their autobiographies reflect efforts to position themselves as unifying figures, resonating with global audiences. While they present themselves as icons, their narratives also expose personal complexities that challenge idealized images. The autobiographies of Mandela and Obama are not only historical records but also tools for shaping legacy (Bongila, 2011). Their narratives reveal silences, contradictions, and deliberate choices in what is shared. The timing of publication—Mandela's *Long Walk to Freedom* and Obama's *Dreams from My Father*—is significant, reflecting their political positioning and the strategic crafting of public image.

Both leaders use creative techniques to narrate their masculine experiences, blending emotional depth with detailed storytelling. Their attention to formative moments and everyday life offers insight into how personal histories inform public leadership. This study argues that multiple masculinities converge to form the broader political identities of Mandela and Obama, shaped by narrative, context, and public reception. Though Obama's leadership emerged in a diaspora context, his influence resonates across Africa, making a comparative study with Mandela relevant in exploring political masculinities. Masculinity is socially constructed and shaped by cultural, historical, and political contexts. Political masculinities reflect dominant ideals of manhood, often competing with marginalized forms. In South Africa, African patriarchal masculinity—rooted in anti-apartheid resistance—contested white, apartheid-driven masculinity. Black political leaders, through their agency, reclaimed distorted African masculinities, elevating their status to heroic icons (Gqola, 2009).

Obama's narrative draws on the American Dream to challenge conservative hegemonic masculinity and promote unity (Rowland & Jones, 2007). Their autobiographies reflect personal ideals—justice, humility, perseverance, and democracy—that align with national values and contribute to their symbolic power. There is need to explore how their personal histories intersect with broader socio-political contexts, and how literature serves as a tool for shaping public identity, reconstructing history, and challenging dominant discourses.

2.3 Iconography and Political Masculinity in Mandela and Obama

Iconography—through speeches, images, and symbolic representation—plays a central role in crafting their public personas as moral leaders and icons of peace. The construction of Mandela's and Obama's masculinities is deeply tied to their iconography—how the public idealizes them as symbols of leadership and morality. Iconography, in this context, refers to the global perception of these figures as icons, often shaped by public discourse, media, and political rhetoric, rather than their lived realities (Hyslop, 2008). Mandela and Obama are admired not only for their leadership but also for their ability to present relatable, humanized versions of themselves while embodying moral and political ideals (Rowland & Jones, 2007).

Mandela's image as a symbol of moral courage under apartheid and Obama's portrayal as a gentlemanly leader reflect their alignment with shared societal values—simplicity, humility, justice, and unity (Ndlovu-Gatsheni, 2014).

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Smith (2009) describes Obama as "a genuinely many-voiced man," emphasizing his plural self-identities and ability to resonate with diverse audiences. Their oratory skills further elevate their status. Mandela spoke of human rights and democracy before these became global discourses, while Obama's speeches often reflected universal values (Ndlovu-Gatsheni & Ngcaweni, 2016). Though Obama's political career unfolded in the diaspora, his African heritage and paternal ties to Kenya position him within African political discourse (Lane, 2023).

Autobiography has gained scholarly attention as a tool for critiquing life narratives (Butler, 2009). Mandela and Obama's masculine identities were shaped early in life through distinct cultural orientations. Mandela's upbringing in the royal household of Chief Jongitaba instilled African democratic values (Garba & Akuva, 2020), while Obama's close bond with his mother and grandparents nurtured values of empathy, honesty, and resilience (Ihua, 2022). This study is framed by the interregnum periods in South Africa and the U.S.—post-apartheid and post-slavery transitions—that shaped Mandela's and Obama's narratives. These historical shifts contextualize their leadership and the political masculinities they represent (Gqola, 2009). As Kelley and Tuck (2016) note, post-1970s Africa saw disillusionment with nationalism, making the emergence of figures like Mandela and Obama critical to reimagining leadership and masculinity.

2.4 Mandela and Obama as Liminal Political Figures

Nelson Mandela and Barack Obama represent liminal political figures—leaders who stand at the threshold of racial divides in their respective nations (Garba & Akuva, 2020). Mandela, shaped by early exposure to apartheid in Johannesburg, navigated the tension between colonial oppression and a post-apartheid future rooted in reconciliation. Obama, born into a racially complex America, confronted identity conflicts shaped by a colonial legacy and responded by embracing the American Dream as a vision for racial equality (Ndlovu-Gatsheni & Ngcaweni, 2016). This study positions both leaders as "in-betweeners," whose liminal identities inspired their political engagement. Their autobiographies reflect personal and national struggles, shaped by cultural, racial, and historical divisions. Mandela's narrative centers on anti-apartheid resistance, while Obama's echoes the civil rights movement, particularly Martin Luther King Jr.'s "I Have a Dream" philosophy—fulfilled symbolically through Obama's presidency (Lane, 2023).

III. METHODOLOGY

This study adopted a qualitative, interpretive approach to examine how political masculinity is constructed in Nelson Mandela's *Long Walk to Freedom* (1994) and Barack Obama's *Dreams from My Father* (1995). According to Yilmaz (2013), qualitative research is an inductive and naturalistic process that seeks to understand how people interpret their lived experiences. Guided by this perspective, the study explored how the two leaders narrate identity, power, and leadership through language and self-representation. A textual and discourse analysis approach was used to provide an in-depth interpretation of the selected autobiographies. The analysis focused on recurring themes, metaphors, and narrative strategies that reveal how masculinity is performed and negotiated within specific socio-political contexts. This approach was context-sensitive, allowing for the examination of Mandela's and Obama's narratives within their respective historical and cultural environments.

IV. FINDINGS & DISCUSSION

4.1 Situating the Self: Intertextuality and Historical Context

Mandela and Obama embed their personal stories within broader socio-political histories, enriching their autobiographies and deepening their iconography. In *Long Walk to Freedom*, Mandela frames his life within the anti-apartheid struggle, referencing events like the Sharpeville Massacre and global resistance to apartheid. These shifts focus from individual heroism to collective liberation. In *Dreams from My Father*, Obama connects his experiences—growing up biracial, studying in Indonesia, and organizing in Chicago—to civil rights history.

References to figures like Malcolm X and Martin Luther King Jr. highlight how his identity and activism are shaped by systemic injustice. His narrative becomes part of a broader story of social transformation.

4.2 Performing an Alternative Masculinity: Subversion of Traditional Masculinity

Both leaders challenge dominant masculinity by presenting strength through empathy, vulnerability, and collaboration. Mandela redefines leadership through compassion, especially in his role in the Truth and Reconciliation Commission. His emphasis on healing over retribution contrasts with conventional ideals of control and aggression.

Obama embraces emotional openness and shared responsibility. He highlights the influence of family, particularly Michelle Obama, and values listening and community engagement. His candid reflections on identity struggles present leadership as inclusive and human.

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Mandela and Obama also subvert traditional masculinity, presenting leadership rooted in empathy and collaboration. The analysis aligns with Foucault's and Butler's theoretical framework on power and gender performativity to elucidate how language and discourse shape the two icon's identities as male political icons. Representations of Mandela as "father of the nation" and Obama as a symbol of Black freedom are discursive constructs they actively reshape through narrative, slogans, and symbolism.

Ultimately, Mandela and Obama use their autobiographies to challenge idealized public images. Mandela states he wasn't born with a hunger for freedom but was shaped by circumstance—dismantling the myth of innate heroism. Both invite readers to engage with the complexities behind their public personas.

4.3 The Public Construction of Barack Obama and Nelson Mandela as Icons

Public construction is a dynamic process—autobiographies serve as platforms where personal narratives are exposed to public scrutiny, shaping perception and identity. Mandela's text, published before his presidency, helped elevate him to global icon status. Obama's autobiography similarly positioned him as a relatable figure, rallying support and reshaping public views of Black leadership. This analysis demonstrates that autobiographies function as strategic tools for political self-definition. They correct misconceptions, influence public discourse, and construct masculine identities that contribute to iconography. However, these identities are fluid and contestable.

Masculinity, leadership, and icon status shift with context, time, and public sentiment.

Mandela and Obama's narratives reveal their vulnerabilities, contradictions, and human flaws. Their texts resist static definitions of manhood, showing that being a political icon does not erase personal complexity. Public perception may idolize them, but their own words highlight the tension between myth and reality. Multiple publics produce multiple masculinities. Some view Mandela as a hero; others as a sellout, especially in light of post-apartheid challenges. Similarly, Obama's image is shaped by both admiration and critique. These shifts underscore the fluidity of public making and the impermanence of icon status. Both leaders use literary techniques—Mandela through dramatic language and metaphor, Obama through paradox, synecdoche, and symbolic imagery—to explore identity, race, and masculinity. Their autobiographies reflect artistic self-awareness and deliberate narrative construction.

Nelson Mandela and Barack Obama's public personas are shaped by iconography—idealized images constructed through media, public discourse, and symbolic representation. Their autobiographies serve as platforms for identity formation, allowing readers to engage with personal narratives that challenge simplified portrayals (Rowland & Jones, 2007). Both leaders are celebrated as moral icons and Nobel Peace Prize laureates, recognized globally for promoting unity in racially divided societies. Their autobiographies reflect personal and collective struggles, elevating them as symbols of justice and reconciliation. Mandela is revered as the "father of the nation," and Obama as a "symbol of Black freedom." However, public perception often flattens their complexity.

Mandela is idealized as a saintly figure, though he acknowledges his flaws: "I have made missteps along the way" (Soyinka, 1988). His emphasis on reconciliation is frequently romanticized, obscuring the difficult negotiations it required. Obama's *Dreams from My Father* reveals internal conflicts and identity struggles. His biracial heritage and outsider status complicate the image of a unifying leader: "I often felt like an outsider" (Stein, 2011); "I had to make my way on the basis of my ability, not my heritage" (p. 31). Both use their autobiographies to reclaim their narratives, offering nuanced portrayals that contrast with their iconic status. Their stories reflect broader societal struggles while exposing the limitations of symbolic leadership.

4.3.1 Barack Obama

In *Dreams from My Father*, Obama reflects on identity, race, and belonging. While often seen as a symbol of hope and unity, his narrative reveals internal struggles. "I often felt like an outsider" (p. 119) and "I had to make my way on the basis of my ability, not my heritage" (p. 31) highlight the tension between public image and personal experience. His biracial heritage is central yet often simplified. "I was the son of a black man from Kenya, a white woman from Kansas" (p. 3) underscores the complexity of navigating dual identities. Obama's introspection and vulnerability foster connection, though public focus tends to emphasize his charisma over his challenges. Obama's leadership vision is rooted in empowerment and community. Yet, the public often idealizes him, overlooking his nuanced understanding of leadership: "A degree was not in itself a guarantee of leadership" (p. 74). He also explores masculinity, noting societal expectations for Black men to appear non-threatening: "Such a pleasant surprise to find a well-mannered young black man who didn't seem angry all the time" (p. 71).

Raised by a white family, Obama learned to navigate identity with restraint and empathy. Cooper (2008) argues he redefined Black masculinity, bridging cultural divides. Obama's activism, including urging Occidental College to divest from apartheid South Africa, reflected his commitment to justice. The slogan "Yes We Can" captured his belief in shared humanity. A visit to his ancestors' graves in Kenya marked a turning point: "Their struggle, my birthright" (p. 430). Obama's early organizing work emphasized action and shared purpose: "Once I found an issue people cared about, I could take them into action… I liked these concepts" (p. 155). His appeal lies in his ability to embody multiple identities

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while remaining relatable. Smith (2009) describes him as "a genuinely many-voiced man… each man must be true to his selves, plural" (p. 4). As a liminal figure, Obama reconciles racial divides, writing: "I occupied the place where their dreams had been" (p. 27).

4.3.2 Nelson Mandela

In *Long Walk to Freedom*, Mandela presents a lifelong commitment to justice and reconciliation: "My hunger for the freedom of my people became a hunger for the freedom of all people… The oppressed and the oppressor alike are robbed of their humanity" (p. 611). Mandela's leadership was shaped by moral conviction and humanistic values. Soyinka (1988) called him a "symbol of culture and dialogue backed by an unparalleled generosity of spirit." Kofi Annan described him as "the most admired, most respected international figure" (Ihuah, 2022, p. 17). Mandela's oratory and foresight positioned him ahead of his time, advocating human rights before they became global discourses (Ndlovu-Gatsheni & Ngcaweni, 2016). Lodge (2006) viewed him as a model of gentlemanly leadership and political masculinity. In post-colonial Africa, where dictatorship often replaced democracy, Mandela stood apart. Ndlovu-Gatsheni, (2014) highlights his decision to serve only one term as a mark of democratic integrity.

4.4 The Limits of Iconography

Narratives of iconic leaders shape public perception and legacy. Nelson Mandela and Barack Obama are celebrated not only for their political achievements but also for the stories they tell. Yet, their autobiographies - *Long Walk to Freedom* and *Dreams from My Father* - reveal complexities that challenge idealized public images. This analysis explored how both leaders use personal anecdotes, introspection, historical framing, and redefinitions of masculinity to resist simplified portrayals. Their vulnerability complicates heroic narratives, while self-reflection exposes moral dilemmas and contradictions. By situating their lives within broader struggles for justice, they connect personal experience to collective history. As demonstrated through Foucault's theories on power the analysis reveals that power is not a thing or a capacity which can be owned either by state, social class or particular individuals. Instead, it is a relation between different individuals and groups and only exists when it is being exercised.

4.5 Narrative Strategies of Humanization

Nelson Mandela and Barack Obama use storytelling, introspection, historical framing, and symbolism to challenge idealized public images and construct nuanced identities.

Personal Anecdotes and Vulnerability Mandela recounts the emotional toll of imprisonment and personal loss, disrupting the image of an unbreakable hero. His strength is shown as forged through suffering and sacrifice. Obama shares his struggles with identity and belonging. His reflections on being biracial and feeling like an outsider complicate the narrative of confident leadership, presenting authenticity over perfection.

Self-Reflection and Moral Complexity Both leaders engage in deep introspection. Mandela reflects on his support for armed resistance and later emphasizes dialogue, challenging the image of a flawless revolutionary. Obama explores systemic racism and the limits of policy, highlighting the need for cultural change. His reflections on race, class, and division underscore the challenges of governance and the importance of empathy. Through these narratives, Mandela and Obama redefine leadership as a journey shaped by growth, ethical complexity, and social awareness. Their autobiographies resist mythologizing, offering nuanced insights into their legacies and the realities of transformative leadership.

Humanizing through Personal Stories Mandela's accounts of imprisonment and emotional loss reveal the personal cost of political struggle. Obama's reflections on childhood and identity highlight the complexities of biracial heritage. These narratives ground their public personas in lived experience.

Introspection and Moral Complexity Both leaders engage in deep self-reflection. Mandela examines the ethical dilemmas of resistance and reconciliation. Obama explores race, identity, and the tension between authenticity and public expectation. Their introspection challenges the myth of flawless leadership.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined how Nelson Mandela's *Long Walk to Freedom* and Barack Obama's *Dreams from My Father* construct political masculinities that diverge from their public iconography. Although both leaders are celebrated globally as moral and political icons, their autobiographies reveal layered and deeply human portrayals shaped by

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struggle, vulnerability, and moral reflection. Mandela's self-representation projects a masculinity grounded in endurance, collective struggle, and ethical restraint, rejecting the dominance and aggression often associated with patriarchal power. Obama, by contrast, presents a reflective and hybrid masculinity informed by his transnational experiences, racial consciousness, and emotional sensitivity. Together, their narratives disrupt idealized depictions of leadership by illustrating masculinity as fluid, performative, and historically contingent. In examining these texts as self-narratives of political subjectivity, the study underscores the role of autobiographical discourse in redefining what it means to be a leader in both postcolonial and global contexts, revealing that political masculinity is as much about moral negotiation and self-fashioning as it is about authority.

5.2 Recommendations

This study recommends that future scholarship continue to interrogate political autobiographies as important cultural texts that shape and challenge dominant understandings of gender and leadership. Researchers should extend this analysis to other African and diasporic figures, including women leaders, to reveal how different socio-political contexts influence the performance of gendered identities. The use of interdisciplinary approaches, drawing from linguistics, literary studies, and gender theory, can deepen the understanding of how language, memory, and narrative structure contribute to the construction of political selves. Moreover, educators and curriculum developers should integrate autobiographical works like those of Mandela and Obama into higher education to encourage students to critically engage with leadership, identity, and social transformation through discourse. Finally, media and cultural practitioners are urged to draw on such nuanced representations of masculinity to move beyond simplistic hero worship and instead promote images of leadership that embrace vulnerability, empathy, and shared humanity.

REFERENCES

Bongila, J. P. (2011). Shaping influences on the leadership of Genghis Khan, George Washington, and Nelson Mandela: Applications for educators. *Journal of Leadership Education, 10*(2), 138–154.

Butler, J. (2009). *Performativity, precarity, and sexual politics*. Seagull Press.

Camille, A. (2009). *Radical paradox and eclipse: Obama as a balm for what ails us*. Routledge.

Cooper, F. R. (2008). Our first unisex president—Black masculinity and Obama's feminine side. *Denv. UL Rev., 86*, 633.

Garba, D., & Akuva, I. I. (2020). The leadership styles of Nelson Mandela as a pattern for African leaders. *Covenant University Journal of Politics and International Affairs, 8*(1), 45.

Gqola, P. D. (2009). The difficult task of normalizing freedom: Spectacular masculinities, Ndebele's literary/cultural commentary, and post-apartheid life. *English in Africa, 36*(1), 61–76.

Hook, D. (2013). *(Post)apartheid conditions: Psychoanalysis and social formation*. Palgrave Macmillan.

Ihuah, A. S. (2022). African leadership recruitment in the image and likeness of Madiba Nelson Mandela. *Thought and Action, 1*(2), 56–59.

Kelley, R., & Tuck, S. (Eds.). (2016). *The other special relationship: Race, rights, and riots in Britain and the United States*. Springer.

Lane, P. (2023). The south in the north: Colonization and decolonization of the mind. In *From Southern theory to decolonizing sociolinguistics: Voices, questions and alternatives* (pp. 39–55).

Lodge, T. (2006). *Mandela: A critical life*. Oxford University Press.

Ndlovu-Gatsheni, S. J. (2014). From a 'terrorist' to global icon: A critical decolonial ethical tribute to Nelson Rolihlahla Mandela of South Africa. *Third World Quarterly, 35*(6), 905–921. https://doi.org/10.1080/01436597.2014.907703

Ndlovu-Gatsheni, S., & Ngcaweni, B. (2016). Nelson Rolihlahla Mandela: Decolonial ethics of liberation and servant leadership. *Third World Quarterly, 33*(5), 915–921.

Rowland, R. C., & Jones, J. M. (2007). Recasting the American Dream and American politics: Barack Obama's keynote address to the 2004 Democratic National Convention. *Quarterly Journal of Speech, 93*(4), 425–448. https://doi.org/10.1080/00335630701593675

Smith, Z. (2009). Speaking in tongues. *The New York Review of Books, 26*, 1–16.

Soyinka, W. (1988). This past must address its present (Dedicated to Nelson Mandela). *Black American Literature Forum, 22*(3), 429–446.

Stein, D. (2011). Barack Obama's *Dreams from My Father* and African American literature. *European Journal of American Studies, 6*(6-1), 34–37.

Yilmaz, K. (2013). Comparison of quantitative and qualitative research traditions: Epistemological, theoretical, and methodological differences. *European Journal of Education, 48*(2), 311–325. https://doi.org/10.1111/ejed.12014

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Assessment of factors affecting mobile money transactions in Tanzania: A case of Yas agents in Dar es Salaam City Council, Dar es Salaam region

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ABSTRACT

Tanzania's financial ecosystem has undergone significant transformation over the past two decades, driven by the rapid growth of digital financial services and financial technology. The innovation of mobile money services has played a crucial role in bringing financial services to previously underserved populations, especially in rural areas where large populations were unable to access formal financial services. Despite these efforts, there exist challenges that hinder the participation of the majority of people in mobile money transactions, hence contributing to the underutilization of the full potential of digital financial services and financial technology. This study aimed at assessing the factors affecting mobile money transactions in the country with a focus on Yas agents in Dar es Salaam City Council. It specifically investigated demographic characteristics that may influence participation in mobile money business and dwelled on the effects of inflation factors, financial factors, and multiple regulations on mobile money transactions. This research was guided by three theories: Friedman's Monetary Theory, the Financing Constraint Theory, and Agency Theory. Both quantitative and qualitative research methods were used in this study. The target population is Yas mobile money agents in the study area. The methods of data collection were cross-sectional surveys using structured questionnaires administered to a sample of 89 mobile money agents. Analysis was done using MS Excel to produce graphs, means ($\bar{x}$), and standard deviations (Std dev). The results revealed that to a large extent (mean 3.69, std. dev. 1.91), respondents perceived that inflation factors have a strong impact on mobile money transactions. Secondly, the financial factors that strongly affect mobile money transactions are affordability, risks, and financial inclusion (mean 4.05, std dev 2.11); while multiple regulations (mean 3.94, std dev 2.04) to a large extent also have negative effects on mobile money transactions. Interestingly, the study revealed that the majority of the agents (67%) have invested less than 500,000 TZS in this business, suggesting the concern of risks involved. The study concludes that challenges, including security concerns and issues with agent availability and liquidity, particularly in rural areas, need to be addressed. Furthermore, the study recommends that individual enterprises should have sufficient access to financial resources and that existing regulatory frameworks for electronic payments should be improved so that policies on mobile money focus on maintaining and enhancing confidence in the system.

Keywords: Financial Factors, Inflation Factors, Multiple Regulations, Mobile Money Transactions, Yas Agents

I. INTRODUCTION

Mobile Money was defined by Jenkins (2008) as money that can be used and accessed via mobile phone. It can be used to perform transactions such as remittances, bill payment, payroll deposit, loan receipt and repayment, and purchases of goods and services such as prepaid airtime, groceries and bus tickets. Aker and Mbiti (2010), defined it as a product that allows clients to use text messages to store value in an account that is accessible by the handset, with the ability to convert cash in and out of the account, and transfer money between users. Mobile Money allows subscribers to bank directly from their mobile phones without physically being in a financial institution like the bank (Afanu & Mamattah 2013). Transactions such as sending and receiving money, buying airtime, payment of bills and buying internet bundles can be done through your mobile wallet on the phone.

According Irura et al. (2013), mobile money transactions are getting better with time and are becoming more popular among consumers and businesses. Though it is dependent on the availability of technology, using mobile money transactions has potential of improving the scope and quality of financial services by expanding opportunities of reducing trading risks, enhancing access to financial services, and ultimately resulting in more economical delivery of goods and services (Kabir, 2013). According to Lakshmi (2015), mobile money was replacing cash among migrant workers in South India because both agents and clients trust these systems. Furthermore, mobile money transactions have changed how people conduct business and make informed decisions about their transactions. Maitai and Omwenga (2016), reaffirm that mobile money transactions make life easier because they are simple to use, beneficial for those without bank accounts, and accessible to the impoverished rural people.

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Notwithstanding the aforementioned advantages and the widespread use of mobile phones, which has encouraged individual businesses to invest significant funds in developing mobile money transaction systems, the adoption rate of mobile money transactions is still lower than anticipated, suggesting that internet and other technology-based transactions are unsafe, impractical, and likely to result in fraud (Ngaruiya, et al., 2014). Mandari and Richard (2018), affirmed that cash transactions despite its apparent ease and convenience have certain drawbacks when compared to mobile money transactions for individual businesses. These drawbacks include anonymity, cash-related crimes, robberies, the expense of handling cash, its easy loss, tracking difficulties, and the potential for money laundering.

However, in Tanzania, Pulver et al. (2010) informed that mobile money transactions have become a more significant support for the establishment and functioning of individual businesses, helping them grow into successful revenue-generating organizations. In an effort to enhance the operations of private businesses, the Tanzanian government has worked to encourage the growth of mobile money transactions through government deduction fees. The 2015 institutionalization of the mobile money transactions policy is one of the government's efforts in this field to hasten individual and socioeconomic development (International Monetary Fund [IMF], 2016). With an increase in users from 360,740 in 2009 to 49,356,465 in 2015, Tanzania's individual industry has seen a rise in mobile money transactions both domestically and internationally. This trend therefore assisted customers to maintain transactional balances in their electronic wallets (United Republic of Tanzania [URT], 2021).

Tigo Tanzania, now known as Yas Tanzania, has a history marked by pioneering digital services and mobile financial solutions. It began operations in 1994 as Mobitel, launching Tanzania's first cellular service. Later rebranded to Tigo, it became a leader in the digital space, offering voice, SMS, internet, and mobile financial services. In 2014, Tigo Pesa (now Mixx by Yas) became Africa's first fully interoperable mobile money service, allowing users to transfer funds across different networks. Recently, Tigo Tanzania has been rebranded to Yas, signaling a shift towards Pan-African ambitions and further digital inclusion.

1.1 Statement of the Problem

Many scholars and researchers agree that mobile money transactions are profoundly changing business and financial decision-making in many markets, especially in developing economies. Ngaruiya et al. (2014) claimed that the advent of mobile money transfers has made banking services more accessible to individual business owners, provided a safe platform for small savings, and encouraged the expansion of individual businesses. The upward surge is further supported by the ever-increasing convenience, expanding financial inclusion for marginalized groups, and enabling new business models. Although there are numerous individual businesses that participate in mobile money transactions, the benefits of these transactions have often been sluggish to materialize, and some businesses do exist as a result of mobile money operations (Olasina, 2015).

Thus, despite the twenty-four hours access to financial services, there is a need for serious push so that businesses can reach new customers, accept new forms of payment, and improve competitiveness, all while contributing to economic growth of the individuals and the country at large. In Tanzania, the majority of people's mobile money transactions have not been fully utilized in spite of good government policy on mobile money transactions of 2016.

The Tanzania Communication Regulatory Authority [TCRA] reported that due to the limited penetration (less than 45%) of mobile and other financial services, business transactions in the formal financial mobile money sector have not yet received widespread acceptance, despite the rise in mobile phone usage (TCRA, 2022). A recent report by Julia (2024) revealed that Tanzania has witnessed a remarkable growth in mobile money uptake, transforming the way people transact across the country. In the same report it affirmed that the adoption of mobile money has increased from 60% in 2017 to 72% in 2023. However, while mobile money has already become an integral part of many Tanzanians' daily lives for peer-to-peer transfers, there remains a significant untapped potential. This phenomenon can be interpreted that are some challenges associated with the use of mobile money transactions; hence the study aims at assessing such challenges and their impact on mobile money transactions in Tanzania.

1.2 Research Objectives

To assess factors affecting mobile money transactions in Tanzania with focus on Yas agents in Dar es Salaam City Council, Tanzania.

1.2.1 Specific objectives

i. Investigate the demographic factors influencing the adoption of mobile money services;
ii. To examine the effects of inflation factors on mobile money transactions;
iii. To determine the effects of financial factors on mobile money transactions;
iv. To identify the effects of multiple regulatory provision on mobile money transactions.

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II. LITERATURE REVIEW

2.1. Theoretical Review

2.1.1 Friedman's Monetary Theory

The monetary theory of inflation developed by monetarist Milton Friedman in 1970 as explained by Karl and Allan (1972) states that inflation is always and everywhere a monetary phenomenon. It asserts that money supply growth is the cause of inflation and that faster money supply growth causes faster inflation. The theory further narrates that inflation will occur if the money supply increases more quickly than the factor of growth of any particular enterprise budget.

There will not be any inflation if the money supply grows in proportion to actual output. According to different scholars, inflation is always a mobile money transaction phenomenon, because it can only be caused by a faster increase in budgetary quantities than in output. According to the former, inflation is brought on by an increase in the money supply and it rises more quickly as the money supply expands. Specifically, 1% greater inflation results from 1% quicker money supply expansion. The money supply is proportional to the level of prices, all other factors being equal. Prices would double if the money supply doubled.

According to Maitai and Omwenga (2016), inflation has been a dominant feature in the modern world when comparing growth factors; as a result, rising inflation is mirrored in rising mobile money service plans.

2.1.2 The Financing Constraint Theory

One of the most significant pillars of corporate budgeting is the financing factor theory (FFT), which was put forth by Modigliani and Miller in 1958. It contends that the influence of financial factors and mobile money transactions results in the interdependence of decisions regarding financing and mobile money transactions. The FFT theory is based on theoretical foundations that include information-driven issues of analyzing mobile money transactions under financial constraints and incentive restrictions, which are prevalent in emerging markets and have a big impact on how mobile money transactions are carried out and how decisions are financed in imperfect markets. Businesses' susceptibility to changes in the overall economy is influenced by their level of financial stability, which also dictates the kind of financing and mobile money transaction policies they can adopt. According to the former, businesses typically spend less on mobile money transactions when they are financially motivated, which lessens the variance in their overall outputs.

2.1.3 Agency Theory

According to Jensen and Meckling (1976) an agent is a person who acts on behalf of another person in dealing with other people. For example, a selling agent acts on behalf of a principal, a manufacturer of goods, to sell goods on the manufacturer’s behalf. Similarly, a stock broker is an agent who acts on behalf of a client (the principal) to buy or sell shares on the client’s behalf. The agent acts on the name of the principal, and commits the principal to agreements and transactions.

Jensen and Meckling (1976) further suggested a theory of how the governance of a company is based on the conflicts of interest between the company’s owners (shareholders), its managers and major providers of debt finance. Each of these groups has different interests and objectives. The shareholders want to increase their income and wealth, they are therefore concerned about dividends, but they are even more concerned about long-term profitability and financial prospects, because these affect the value of their shares. Meanwhile the managers are employed to run the company on behalf of the shareholders. Managers have an employment contract and earn salaries. Furthermore, major providers of debt have an interest in sound financial management by the company’s managers, so that the company will be able to pay its debts in full and on time.

Jensen and Meckling (1976) furthermore, defined the agency relationship as a form of contract between a company’s owners and its managers, where the owners (as principal) appoint an agent (the managers) to manage the company on their behalf. As a part of this arrangement, the owners must delegate decision-making authority to the management.

2.2 Empirical Studies

2.2.1 Effects of Inflationary Factor on Mobile Money Transactions

A study by Higgins et al. (2012) examined how mobile money transactions and inflationary factors interacted in Ghana. Primary and secondary data were gathered from several small and medium-sized individual businesses using a descriptive study design. The method of purposive sampling was used. There were 120 responders in the trial. Data was gathered via a questionnaire. The econometric method of ordinary least squares was employed in the investigation. The results revealed that inflationary price increases account for about 30% of the growth. The study came to the conclusion that the government must take the lead in the fight against inflation since it is a national issue. According to

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the study's findings, the first impact is seen in the form of higher operating expenses brought on by inflationary price which impacted on goods and services bought in the marketplace. The study suggested that in order to control cost-push inflation, the government could lower taxes on a number of suitable indicators that indicate price increases for a range of goods and services.

Wong and Tang (2020), investigated the relationship between credit card usage and inflation in Malaysia using Autoregressive Distributed Lag (ARDL) and time-series data from 1997–2017. The study found that in the long run, credit card usage has a stronger effect on prices than bank lending, and economic activity remains the most influential determinant of price levels. In the short run, bank credit growth and money supply growth are key drivers of inflation.

Puspita et al (2024), carried out a study in Indonesia to identify the effect of e-money, demand deposits, currency, and quasi-money on inflation. Using the Error Correction Model approach and an observation period from 2010 to 2020, the study showed that demand deposits have no effect on inflation in Indonesia. Meanwhile, currency had a positive effect on inflation both in the long and in the short term. The e-money and quasi-money variables proved to have a negative effect on inflation in the country on the long run. The results indicated that the more e-money and quasi-money there is, the more people use non-cash transactions, which in turn can reduce the inflation rate.

2.2.2 Effects of Financial Factor on Mobile Money Transactions

Isaac and Jenny (2010) conducted research to assess the impact of financial factors on mobile money transactions in Brazil. With a sample of 258 respondents that were purposefully chosen, the study used a descriptive design. Data was gathered via questionnaire and interview. To ascertain the relationship between financial factors and mobile money transactions, the researcher employed the Engle-Granger Cointegration test, error correction, and Granger causality as estimation techniques. The results showed that financial factors resulted in a 65 billion budget revenue gap due to lower budget expenditures available to fund business efficiency, of which aid has only covered one-third of the budgeted amount. The study suggested that each business should make sure that there are more creative funding sources available to support advancement toward the development goal's completion. Other important financial factors identified were risks and trust.

In another study in Ghana by Tobbin and Kuwornu (2011) on consumer behaviour towards the adoption and use of mobile money transfer, it was revealed that the intention to use mobile money transfer was found to be below average. Out of a total of 288 respondents, 48.4% responded "Yes" to having an intention to use mobile money, 28.3% said "No" and 23.3% were unsure. The study concluded that the adoption of mobile money transfer is dependent on consumers' perception on trust and risk.

2.3.3 Effects of Multiple Regulatory Provisions on Mobile Money Transactions

The Global System for Mobile Association (GSMA) in 2018 launched the Mobile Money Regulatory Index (MMRI), a tool that quantitatively assessed how effectively countries' regulations enabled mobile money, covering 90 economies with a scale of 0-100 based on six dimensions and 26 weighted indicators. The MMRI's dimensions included authorization, consumer protection, transaction limits, Know Your Customer (KYC), agent networks, and investment/infrastructure. The index provided policymakers and regulators with nuanced insights into their markets to promote mobile money growth and financial inclusion.

A study by World Bank (2021) informed that effectiveness of mobile money payments depends on a supportive regulatory environment. Requirements such as Know-Your-Customer (KYC) rules, consumer protection frameworks, and agent transparency can influence the ease with which people use mobile money. An enabling regulatory framework allows the development of innovative and sustainable mobile money banking services that can effectively serve beneficiaries. In Ghana, revision of agent banking and e-money guidelines permitted mobile network operators to offer mobile money accounts. Ghanaian financial service providers were able to invest in agent recruitment, customer education, and expand coverage of mobile money accounts. According to the Global Findex database, the share of adults with mobile money accounts tripled between 2014 and 2017 in Ghana.

Other studies in Kenya and Tanzania on mobile credit services showed that they have achieved early success in mobile financial services according to Blechman (2016). However, while these new services have the potential to further promote financial inclusion, they also raise novel regulatory issues and do not fit neatly into pre-existing regulatory categories. This is due to the nature of mobile credit and the variety of entities and regulatory frameworks implicated in the business models found in these two markets.

III. METHODOLOGY

3.1 Research Design

Both quantitative and qualitative research methods were used in this study. Quantitative methods probed the demographic characteristics of the study population; while qualitative methods were used to obtain data on the factors

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affecting mobile money transactions. Qualitative research designs are the commonly used to examine a person, group, community or institution. They focus on understanding concepts and experiences through non-numerical data like interviews and observations (Saunders et al., 2015). All participants chosen must share a unifying factor, which means they all must have a direct or indirect connection to the research question or subject being studied.

3.2 Area of the Study

The study was carried out in Dar es Salaam City Council of Dar es Salaam region which has an area of 208Km^2. This area was selected because cost effective and assurance of accessibility of information as well as closeness of researcher to the study population in terms of transportation. Dar es Salaam City Council with a population of 1,649,912 inhabitants in 458614 households, is one of the Local Governments in Dar es Salaam region and occupies almost the entire Ilala district (URT, 2021). The City council has many different business companies and one of them Yas Mobile Network Operators who use several Agents which are the focus under this study. Other Mobile telephone companies who have invested heavily the city include Airtel, Vodacom, Halotel and Zantel.

According to NBS (2024), there is a significant mobile phone penetration in Dar es Salaam region, with 94.0 percent of persons aged 15 years and above owning mobile phones, 47.6 percent of them own only non-smartphones. Usage proportions are similarly high, with 92.2 % of persons aged 15 years and above use ICT equipment for communication. The non-smartphones are mostly used by individuals who attained training after secondary education (98.4%).

3.3 Population of the Study

According to Kothari et al. (2022), a population is any whole group of things or individuals that have certain traits in common. Either, McMillan and Schumacher (2013), defined a population as a group of individuals or events from which a sample is drawn and to which results can be generalized. In this study the population is Yas mobile money agents. According to TCRA (2022) the operation of Yas mobile money infrastructure has been increasing since inception (Table 1).

Table 1

Development of Mobile Money Services with Yas Company

Year	Registered subscribers	Market share	MM subscribers	Market share
2012	6,370,796	24%	N/A	N/A
2013	6,297,288	23%	N/A	N/A
2014	8,624,638	25%	N/A	N/A
2015	11,115,991	28%	5,252,523	30%
2016*	11,606,567	29%	5,584,052	32%
2017	11,062,852	27.7%	6,091,578	27%
2020	12,660,697	25%	8,754,060	28%

Source: Tanzania Communication Regulatory Authority (2022)

Table 1 shows that by December 2020, Yas mobile money services had 8,754,060 subscribers countrywide. However, there were 110,000 Yas mobile money agents registered by 2022 across the whole mainland Tanzania. In this study the regional figures for Dar es Salaam and subsequent the city council, the focus of this study are not clearly given, however, preliminary survey through transects walk in a rectangular polygon 100m x 33km from Ilala Boma to Chanika identified 120 agents, which formed study population.

3.4 Sampling Design and Sample Size

3.4.1 Sampling Design

A sample is a collection of items selected from a population in order to estimate the population's characteristics (Adam & Kamuzora, 2008). Purposive and random sampling was used in the study to choose study participants. Choosing the most pertinent data instances to find and select individuals or groups of individuals who possess the necessary skills and knowledge about a given phenomenon is a commonly employed technique in both quantitative and qualitative research (Bowling, 2009).

3.4.2 Sample Size

According to Kothari et al. (2022), sample size is the quantity of objects or responders that must be chosen from the entire population in order to form a sample. Yamane (1967) provided a simplified formula for computing sample size when the targeted population is formed by less than ten thousand individuals/variables which is widely used. This formula was employed by Saunders et al. (2015) in their study while computing the sample sizes for different categories of the targeted populations for study, at a 5% precision level. This study employed the same formula: $n = N/(1+N(e)^2)$;

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where: n = Sample size; N = is the Targeted study population; e = Level of precision (0.05) to generate a sample size of 92 respondents, which upon data cleaning 89 were found to be responsive.

3.5 Data Gathering Methods

During the study both primary and secondary data were collected. Primary data collection methods used include observation, questionnaires and interviews. Secondary data collection method that used were reviews of different documents relevant to the study.

3.6 Data Collection Tools

According to Cooper and Schindler (2008), a questionnaire is made up of several questions that are typed or printed on a form or series of forms in a specific order for the purpose of carrying out surveys to gather information. The researcher used both closed-ended and small number of open-ended questions. Thirty-five (35) questions made up the questionnaires, six of them focused on demographic characteristics of the study population that influence participation in mobile money business, ten of them focused on inflation factors, eleven questions concentrated on financial factors and eight questions probed on the effects of multiple regulatory provision factors on mobile money transactions.

3.7 Data Analysis

This study used both quantitative and qualitative data analysis. The assessment variables were the actual probe questions used to generate data on the issues being researched. With the exception of the demographic characteristics, which had discrete figures, each factor being investigated had five (5) possible responses: Strongly disagree, Disagree, Neutral, Agree, and Strongly Agree. For the purpose of qualitative analysis in the MS Excel program, the five possible responses corresponding to the Likert scale were coded as follows: Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). The quantitative analysis was used to analyze the demographic characteristics of the study population.

IV. FINDINGS & DISCUSSION

The study findings on demographic characteristics the study population as presented in figures and tables, while those on effects of inflation and financial factors on mobile money transactions and that of multiple regulatory provisions are presented in tables of means ($\bar{x}$) and standard deviations (Std dev) supported by a 5-point Likert scale with a range of 0.8.

4.1 Reliability TestA

Reliability test in these findings used the Cronbach's alpha (α) coefficient. When Cronbach's alpha is greater than 0.9 it means that the internal consistency reliability is excellent. When it is greater than 0.8 (>0.8) the reliability is good; while greater than 0.7 is acceptable and greater than 0.6 is still acceptable. When it is 0.5 to 0.58 is poor and when it is less than 0.5, internal consistency is unacceptable. In this study Cronbach's alpha (α) coefficient was 0.97, meaning that internal consistency is excellent (Creswell, 2009).

4.2 Demographic characteristics

4.2.1 Age groups distribution

Four age groups composition of the participants have been identified and presented in Table 2.

Table 2

Age Group Distribution

Age groups	Frequencies (n=89)	%
18-25 years	12	13.48
26-35 years	56	62.92
36-45 years	17	19.10
>45 years	4	4.49

Table 2 shows that the most active age group in mobile money business is between 26-35 years occupying 63% of the study population. In a normal community this the age in which people are actively involved with their own development agenda in order to make a difference within the community settings.

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4.2.2 Gender Composition

Gender composition revealed that 49.4% of the study population are women, while 50.6% are males. Table 3 shows this trend and actually it can be interpreted that both female and male are equally involved in mobile money transaction business.

Table 3

Gender Composition

Gender	Frequencies (n=89)	%
Female	44	49.44
Male	45	50.56

4.2.3 Education status of study population

Education is a pre-requisite for any business to shrive. Table 4 reveals that most of the participants involved in the Yas mobile money business have technical education (31%), graduates with first degree (28%), or secondary school leavers (28%). Interesting is note that even some respondents are postgraduate degree holders (12%). This trend can be interpreted that mobile money transaction business has created a diverse employment status across the communities.

Table 4

Education Status

Education	Frequencies (n=89)	%
Bachelor degree	25	28
Secondary education	25	28
Postgraduate	11	12
Technical education	28	31

4.2.4 Employment Opportunities

Table 5 displays the employment opportunity provided by mobile money transaction business among the Yas agents in the study area.

Table 5

Employment by Sector in the Study Population

Employment	Frequencies (n=89)	%
Private Sector	28	31.46
Public Sector	19	21.35
Self-employment	29	32.58
Students	5	5.62
Informal employment	8	8.99

The table shows that most of the agents are self-employment (33%), while 32% are registered in the private sector. Either public sector has absorbed 21%, and 9% are in informal sector, while students (6%) are the lowest engaged in the mobile money transaction business. In relation to the education status findings, these results can be interpreted that the most technical education graduates and those with first degree do find employment opportunity in the mobile money transaction business.

4.2.5 Financial Investment in Mobile Money Transactions

Table 6 shows that majority of the respondents (67%) have invested below 500,000 TZS in mobile money transactions and about 18% have investment ranging between 510,000-1,000,000 TZS, about 8% invested between 1,100,000-1,500,000TZS, about 3.5% fall in the range of 1,510,000-2,000,000 TZS, while another group of 3.5% do afford to invest above 2,000,000 TZS.

Table 6

Financial Investment in Mobile Money Sector

Investment	Frequencies (n=87)	%
<500,000 TZS	58	66.67
510,000 - 1,000,000 TZS	16	18.39
1,100,000-1,500,000 TZS	7	8.05
1,510,000-2,000,000 TZS	3	3.45
>2,000,000 TZS	3	3.45

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The interpretation can be that majority of the people involved in mobile money business are unable to access financial capital or are afraid of taking financial risks. As revealed in the educational status probe, the majority of these respondents are the technical graduates and those with first degree.

4.3 Factors Affecting Mobile Money Transactions in Tanzania

4.3.1 Effects of Inflation Factors on Mobile Money Transactions

Most important inflation factors that affect mobile money transactions are agency fee and network costs, erosion of purchasing power and financial instability, and shifting priorities. The results of inflation factors and their related impacts on mobile money transactions are summarized in table 7. The table shows that all inflation factors to a large extent (Mean 3.69, Std dev 1.91) contribute negatively to the effects of mobile money transactions. However, the need for Central banks to carefully manage monetary policy to control inflation and maintain the stability of mobile money systems (Mean 4.01, Std dev 2.10) is strongly echoed by most of the respondents. Also, the need for regulators to ensure that mobile money platforms are adequately protected from the negative effects of inflation so that users are not unduly burdened seems to be highly agreed by most the respondents (Mean 4.03, Std dev 2.09).

Table 7

Summary of Inflation Factors on Mobile Money Transactions

Variables	Mean	Std dev
Inflation increases transaction costs due to rise of cost of goods and services	3.65	1.89
Inflation triggers increase in agent fees on mobile money transaction for the agency to maintain profitability	3.65	1.88
Inflation has the potential of making mobile money a less attractive option for users.	3.71	1.92
As the costs of maintaining mobile network infrastructure increase with inflation, mobile network operators might pass those costs onto users	3.69	1.88
Inflation erodes the purchasing power of digital balances held in mobile money accounts, meaning users need more money to buy the same goods or services.	3.64	1.87
Inflation triggers users to prioritize spending on essential goods and services over saving or making non-essential transactions through mobile money services	3.43	1.75
High and sustained inflation might lead users to be less inclined to save money in mobile money accounts, as the real value of their savings decreases over time	3.33	1.73
Increased inflation can lead to greater volatility in mobile money transactions, as users might be more cautious with their spending and saving habits	3.50	1.83
In areas with limited access to traditional banking, mobile money can still offer a vital service for sending and receiving money, even during inflationary periods	3.98	2.08
Central banks need to carefully manage monetary policy to control inflation and maintain the stability of mobile money systems	4.01	2.10
Regulators need to ensure that mobile money platforms are adequately protected from the negative effects of inflation so that users are not unduly burdened	4.03	2.09
Mean average and SD	**3.69**	**1.91**

It should be noted that as the more the mean is closer to 5, the higher the impact, hence it can be deduced that there is a high potentiality of inflation making mobile money a less attractive option for mobile money users. According to Maitai and Omwenga (2016), inflation has been a dominant feature in the modern world when comparing growth factors; as a result, rising inflation is mirrored in rising mobile money service plans. The main problem posed by intergenerational money is striking a balance between the challenges that are now and those that may arise in the future (Njau, 2015). In this case, future pricing standards that may deviate from the amount of mobile money are typically influenced by the liabilities as well as the simplicity of completing endowment mobile money transactions.

4.3.2 Effects of Financial Factors on Mobile Money Transactions

Financial factors examined include affordability of transaction costs, security risks and financial inclusion and impact on businesses performance. The results in table 8 show that the perceived cost and value of mobile money services to large extent (Mean 3.77, Std dev 1.92) play a crucial role in adoption. If the cost of transactions, registration, or maintaining an account is perceived as too high, it can deter potential users, as echoed by most of the respondents (Mean 4.02, Std dev 2.10). Meanwhile, mobile money aims to reduce transaction costs compared to traditional banking. To a large extent (Mean 4.10, Std dev 2.15) lower transaction fees, especially for small transfers, can encourage wider adoption and usage. Either, to large extent (Mean 4.20, Std dev 2.23) perceived security risks, such as fraud or data

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breaches, can significantly impact user confidence. Thus, robust security measures and clear communication about safety protocols are essential for building trust and encouraging adoption (Mean 4.14, Std dev 2.16).

Table 8

Summary of Financial Factors on Mobile Money Transactions

Variables	Mean	Std dev
The perceived cost and value of mobile money services play a crucial role in adoption	3.77	1.92
High cost of transactions, registration, or maintaining an account it can deter potential user	4.02	2.10
Lower transaction fees can encourage wider adoption and usage of mobile money services	4.10	2.15
Perceived security risks, such as fraud or data breaches, can significantly impact user confidence	4.20	2.23
Robust security measures are essential for building trust and encouraging adoption of MMT	4.14	2.16
Mobile money transactions can increase economic activity and improved financial well-being of its users	4.07	2.13
Mobile money has the potential to expand financial inclusion for the unbanked or under-banked populations	4.11	2.16
The integration of mobile money with other financial services enhances utility and encourage wider adoption	4.02	2.09
Sound and supportive regulation from governments is vital for fostering a healthy mobile money ecosystem	3.94	2.03
MMS can positively impact the financial performance of businesses, particularly small and medium-sized	4.19	2.18
Mobile money improves individual financial management by providing secure way to save, send and receive money.	3.94	2.05
Mean average and Std dev	**4.05**	**2.11**

Furthermore, mobile money to a large extent (Mean 4.11, Std dev 2.16) has the potential to expand financial inclusion by providing access to financial services for the unbanked or underbanked populations. This can lead to increased economic activity and improved financial well-being for individuals and communities. Either, integration of mobile money with other financial services, such as bank accounts and credit systems, to a large extent (Mean 4.02, Std dev 2.09) can enhance its utility and encourage wider adoption. Interoperability between different mobile money platforms is also crucial for seamless transactions.

Upon assessment of impact of mobile money transactions on business performance, the results show that to large extent (Mean 4.19, Std dev 2.18) mobile money can positively impact the financial performance of businesses, particularly small and medium-sized enterprises (SMEs) like the Yas mobile money services. It can reduce transaction costs, improve cash flow management, and facilitate access to new markets. Also, to a large extent (Mean 3.94, Std dev 2.05), mobile money can improve individual financial management by providing a convenient and secure way to save, send and receive money, pay bills, and access other financial services.

A study by Senso and Venkatakrishnan (2013) conducted in Singida district on challenges of market penetration and expansion by the mobile-phone money transfer services identified several significant challenges affecting the market penetration, market expansion and regular use of mobile money. Among them were lack of financial capital for agents, unavailability of network coverage and regulatory barriers. Hence, the reduction of transaction charges, ensuring widespread availability of agents in rural areas, stability of network, regular supply of electricity, training and information to users were suggested as the necessary measures required to increase the usage, penetration and expansion of MMS.

Kirui et al. (2013) found that mobile phone-based money transfer services in rural areas helped to resolve a market failure that farmers face and it enabled them access financial services. They observed that mobile money services were simple to operate; the registration process was simple and could be completed within few minutes and there were many access points (agents) which improved the delivery of financial services. This means that the usage of mobile money services enabled SMEs improve financial services which increased financial inclusion and thus influenced its usage in business undertaking. Interoperability between different mobile money platforms is also crucial for seamless transactions.

A study by Abiona and Koppensteiner (2018) integrated three variables namely perceived risk, perceived benefit and perceived value, to predict consumers' intention to use mobile money services. The study found that the perceived value together with the perceived risk and benefit directly affect consumers' intention of adopting the technology in business operation. In another study, Pavlou (2003) integrated trust and risk with the technology acceptance model in explaining the consumer acceptance of electronic commerce. The results showed that trust and risk were significant in influencing the usage of technology.

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4.3.3 Effects of multiple regulatory provision factors on mobile money transactions

The results showed that supportive regulatory environment, including clear KYC rules, robust consumer protection, and transparent agent practices, to large extent (Mean 3.98, Std dev 2.06) encourages user adoption and trust as revealed in table 9. Conversely, overly complex or unclear regulations to a large extent (Mean 4.08, Std dev 2.15) can discourage both providers and users. For example, onerous enrolment procedures can slow customer acquisition and increase costs.

Table 9

Summary of Multiple Regulatory Factors on Mobile Money Transactions

Variables	Mean	Std dev
Supportive regulatory environment on mobile money transactions encourages user adoption	3.98	2.06
Clear rules, robust consumer protection, and transparent agent practices builds trust and encourages user adoption	4.01	2.08
Complex or unclear regulations can discourage both providers and users of mobile money services.	4.08	2.15
Stringent KYC processes can be a barrier to entry for some, particularly those lacking formal identification, potentially leading to financial exclusion	3.82	1.95
Strong consumer protection frameworks are crucial for building user trust and confidence in mobile money services	4.02	2.08
Regulations governing mobile money agents, such as agent liquidity and performance, are vital for ensuring smooth transactions	3.92	2.01
Regulations promoting interoperability between different mobile money platforms can enhance user convenience and drive wider adoption	3.73	1.90
Tanzania has seen substantial growth in mobile money subscriptions and transactions, driven by factors like increased mobile phone and internet access, and a growing awareness of the service.	3.95	2.05
Mean average and Std dev	**3.94**	**2.04**

It should be noted that regulations affect the commercial viability of mobile money services. For instance, unclear legal frameworks or lack of consumer protection can deter users. Furthermore, the importance of KYC requirements cannot be underscored, however while essential for security, stringent KYC processes can be a barrier to entry for some, particularly those lacking formal identification, potentially leading to financial exclusion. This observation has been confirmed by most of the respondents to large extent (Mean 3.82, Std dev 1.95) as indicated in table 9. Thus, strong consumer protection frameworks are crucial for building user trust and confidence in mobile money services (Mean 4.02, Std dev 2.08). Furthermore, regulations governing mobile money agents, such as agent liquidity and performance to large extent (Mean 3.92, Std dev 2.01) are vital for ensuring smooth transactions. The study also revealed that regulations that promoting interoperability between different mobile money platforms to a large extent (Mean 3.73, Std dev 1.90) can enhance user convenience and drive wider adoption.

These findings support those generated by Senso and Venkatakrishnan (2013) which concluded that regulatory barriers contribute to low penetration level of mobile money services in Singida district. Similarly, the World Bank report (2013) on Enterprise survey in Tanzania pointed out that, poorly designed or implemented regulations can hinder benefits, potentially create new digital divides and exclude vulnerable populations. Therefore, a balanced and well-considered regulatory approach is essential for maximizing the positive impact of mobile money on individuals, businesses, and the overall economy.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Tanzania has seen substantial growth in mobile money subscriptions and transactions, driven by factors like increased mobile phone and internet access, and a growing awareness of the service. A good portion of the population (men and women) do participate in mobile money transaction business. Awareness and lack of employment in the public sector have driven a number of technical and University graduates to be engaged in mobile money business. This should be taken as positive venture because mobile money transactions agents are becoming refugees for the unemployed graduates. However, challenges remain, such as security concerns, agent availability and liquidity, particularly in rural areas. Although the Tanzanian government is implementing regulations to address these challenges more efforts are needed to build confidence among the users of mobile money transactions.

5.2 Recommendations

This research has unpacked the factors and challenges related to mobile money transactions with Yas mobile money agents in Tanzania, which are likely applicable to other mobile service providers such as Vodacom, Airtel, and

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others. Consequently, it offers some important recommendations. Among these, individual enterprises involved in the mobile money business must ensure they have sufficient access to financial resources to fund their operations and support their ventures for improved efficiency. The study further recommends that existing regulatory frameworks for electronic payments be enhanced to ensure policies on mobile money focus on maintaining and strengthening confidence in the system. Additionally, reviewing the National Payments System Act, 2015, is crucial to clarify the roles of regulators, strengthen oversight, and allow for the expansion of the regulatory framework. Furthermore, it would be prudent for the Bank of Tanzania (BoT) to initiate and implement deposit insurance coverage for individual mobile money accounts, thereby addressing operational risks and enhancing contingency planning. Notwithstanding these suggestions, the BoT could also strengthen the interest rate channel to enable even small financial capitals to borrow and pay accordingly. The study additionally emphasizes the importance of improving interoperability between different mobile money providers to promote wider adoption and usage of mobile money services. Lastly, reducing regulatory barriers is essential to build confidence in mobile money platforms, ensuring that payments are processed safely, securely, and efficiently, and that mobile money deposits remain available for conversion and transfer at all times.

REFERENCES

Abiona, O., & Koppensteiner, M. F. (2018). *Financial inclusion, shocks and poverty: Evidence from the expansion of mobile money in Tanzania*. IZA Discussion Paper No. 11928. Institute of Labor Economics (IZA). https://ideas.repec.org/p/iza/izadps/dp11928.html

Adam, J., & Kamuzora, F. (2008). *Research methods for business and social studies*. Mzumbe Book Project.

Afanu, E. K., & Mamattah, R. S. (2013). Mobile money security – "A holistic approach". MSc. Information Security, Lulea University of Technology.

Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *The Journal of Economic Perspectives, 24*(3), 207–232.

Blechman, J. G. (2016). Mobile credit in Kenya and Tanzania: Emerging regulatory challenges in consumer protection, credit reporting, and use of customer transactional data. *The African Journal of Information and Communication, 17*, 61–88.

Bowling, A. (2009). *Research methodologies in health* (3rd ed., pp. 162–176). McGraw-Hill.

Brunner, K., & Meltzer, A. H. (1972). Money, debt, and economic activity. *Journal of Political Economy, 80*(5), 951–977.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). Sage Publications.

GSMA. (2018). Mobile money regulatory index, 2018. https://www.gsma.com/solutions-and-impact/connectivity-for-good/mobile-for-development/the-mobile-money-regulatory-index/

Higgins, D., Kendall, J., & Lyon, B. (2012). Kenyan small and medium businesses' mobile money usage trends. *Innovations: Globalization, Governance, and Technology, 7*(2), 67–81.

IMF. (2016). *United Republic of Tanzania, country report no. 2016/255: Selected issues—macrofinancial issues*. https://doi.org/10.5089/9781498391177.002

Irura, S., Nganga, M., Mwachofi, & Munjiru, M. (2013). Technology adoption and the banking agency in rural Kenya. *Journal of Sociological Research, 4*(1), 249-266.

Isaac, M., & Jenny, C. A. (2010). African economic development with mobile phones. *Journal of Economic Perspectives, 24*(3), 207–232.

Jenkins, B. (2008). *Report on developing mobile money ecosystems*. International Finance Corporation & Harvard Kennedy School.

Jensen, C. M., & Meckling, H. W. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics, 3*(4), 305–360.

Julia, S. (2024). Deepening rural financial inclusion through expansion of banking agents. *Research and Insights, Financial Sector Deepening Tanzania (FSDT)*.

Kabir, M. R. (2013). Factors affecting mobile banking use: A case from a developing nation. *World Review of Business Research, 3*(3), 96–114.

Kirui, O. K., Okello, J. J., Nyika, R. A., & Njiraini, G. W. (2013). Impact of mobile phone-based money transfer services in agriculture: Evidence from Kenya. *Quarterly Journal of International Agriculture, 52*, 141–162.

Kothari, C. R., Umesh Kumar, B., & Dubey, D. (2022). *Research methodology: Techniques and trends* (1st ed.). Chapman & Hall/CRC Press.

Lakshmi, K. (2015). Role of mobile money in replacing cash: A study among migrant workers in South India. *Economic and Political Weekly, 50*(28), 116–123.

Licensed Under Creative Commons Attribution (CC BY-NC)

Maitai, J., & Omwenga, D. (2016). Factors influencing the adoption of mobile money transfer strategies in Kenya's telecom sector: A case study of Safaricom-Kenya Ltd. *IOSR Journal of Management and Business, 18*(10), 84–94.

Mandari, E., & Richard, E. (2018). Factors affecting mobile banking service usage: Tanzania's Ilala District case. *Journal of ORSEA, 7*(1), 42–54.

McMillan, J., & Schumacher, S. (2013). *Research in education: Evidence-based inquiry* (7th ed.). Pearson.

NBS. (2024). Dar es Salaam region basic demographic and socio-economic profile report; Tanzania, December 2024.

Ngaruiya, B., Bosire, M., & Kamau, S. (2014). Effect of mobile money transactions on financial performance of small and medium enterprises in Nakuru Central Business District. *Research Journal of Finance and Accounting, 5*(12), 53–58.

Njau, J. E. (2015). Tanzanian microbusinesses' use of mobile phones and how it affects their operations: A case study of Moshi municipality microbusinesses. *Journal of Economics International, 3*(6), 1047–1057.

Olasina, G. (2015). Factors affecting academics' use of M-banking: A case study of SMS-based M-banking. *Journal of Information Systems in Africa, 7*(4), 56–76.

Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce, 7*(3), 101–134.

Pulver, C., Camner, G., & Sjoblom, E. (2010). What makes a successful mobile money implementation? Learnings from M-PESA in Kenya and Tanzania. GSMA – Mobile Money for the Unbanked.

Puspita, D. S., Saraswati, B. D., & Pertiwi, A. T. (2024). The effect of e-money on inflation in Indonesia: An application of the quantity theory of money. In *Proceedings of the Medan International Conference on Economics and Business (MICEB)* (Vol. 2). Universitas Muhammadiyah Sumatera Utara.

Saunders, M., Thornhill, A., & Lewis, P. (2015). *Business research techniques* (6th ed.). Pearson.

Schindler, P. S., & Cooper, D. R. (2008). *Business research methods* (10th ed.). McGraw-Hill International.

Senso, N. C., & Venkatakrishnan, V. (2013). Challenges of mobile-phone money transfer services' market penetration and expansion in Singida District, Tanzania. *International Journal of Research in Management & Technology, 3*(6), 205–215.

TCRA. (2022). Tanzania communication regulatory authority: Quarterly telecom statistics, quarter 4 report, 2022.

Tobbin, P., & Kuwornu, J. K. M. (2011). Adoption of mobile money transfer technology: Structural equation modeling approach. *European Journal of Business and Management, 3*(7), 59–77.

URT. (2021). Dar es Salaam region investment guide. President's Office, Regional Administration and Local Government.

Wong, Z. J. R., & Tang, T. C. (2020). Credit card usage and inflation: A case study of a small open economy. *Journal of Economics Malaysia, 54*(1), 19–32.

World Bank. (2013). Enterprise surveys: Tanzania country profile. https://doi.org/10.1596/978-0-8213-9877-3

World Bank. (2021). The role of mobile money regulations: Evidence from Sub-Saharan Africa. World Bank Development Research Group.

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Wiley & Sons.

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The role of service quality in automated health systems on customer satisfaction: Evidence from National Social Security Fund (NSSF) Ilala, Dar es Salaam, Tanzania

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ABSTRACT

Healthcare systems worldwide are increasingly adopting automation to enhance service delivery, yet the relationship between automated service quality and customer satisfaction remains underexplored in developing contexts. This study examined how assurance and reliability dimensions of automated processing procedures influence customer satisfaction among National Social Security Fund (NSSF) beneficiaries accessing Social Health Insurance Benefit (SHIB) services in Ilala, Dar es Salaam, Tanzania. Grounded in the Service Quality (SERVQUAL) model, the study employed a descriptive research design with a quantitative approach. From the target of 490 beneficiaries, a sample of 220 NSSF beneficiaries was selected using Yamane's formula and simple random sampling. Data were collected through structured questionnaires using a five-point Likert scale and analyzed using descriptive statistics and multiple regression analysis via SPSS version 23. Results revealed that both assurance ($\beta = 0.482$, $p < 0.001$) and reliability ($\beta = 0.317$, $p = 0.001$) significantly and positively influenced customer satisfaction, jointly accounting for 45% of the variance ($R^2 = 0.450$). Assurance, operationalized through security, confidentiality, and trust; demonstrated a stronger predictive effect than reliability which was undermined by occasional system downtimes and technical failures. These findings underscore the critical importance of robust assurance mechanisms and consistent system reliability in enhancing satisfaction with automated health insurance processes. The study recommends strengthening data protection protocols, improving system uptime through real-time monitoring and preventive maintenance, providing continuous training for healthcare agents, and conducting periodic system audits to sustain efficiency, trust and satisfaction. These insights contribute to theory by reinforcing the SERVQUAL model's applicability in health insurance automation contexts and offer practical strategies for improving automated healthcare systems in Tanzania and similar developing economies.

Keywords: Automated Health System, Customer Satisfaction, NSSF, Service Quality, SHIB

I. INTRODUCTION

The global healthcare landscape has undergone substantial transformation through digital innovation and automation, fundamentally reshaping medical infrastructure, service delivery mechanisms and patient experiences. The World Health Organization (WHO) emphasizes that digital health technologies represent essential tools for achieving universal health coverage and improving health outcomes, particularly in resource constrained settings (WHO, 2020). In developing countries such as Tanzania, the integration of automated health systems has become increasingly critical for addressing longstanding challenges related to healthcare accessibility, timeliness at the hospitals and quality of service provision that offered to beneficiaries. These technological interventions aim to reduce issues of administrative burdens, minimize human error that produces services and enhance the efficiency of healthcare delivery systems.

The National Social Security Fund (NSSF) established under the NSSF Act (Chapter 50, Revised Edition 2018) extending health insurance coverage to its members through the Social Health Insurance Benefit (SHIB) program by providing medical coverage for insured persons, their spouses and up to four dependents. NSSF has partnered with accredited medical providers nationwide and adopted automated health systems to ensure efficient delivery of medical benefits. According to Kwesigabo et al. (2019), these partnerships represent significant steps toward modernizing Tanzania's social security healthcare framework. Despite these technological advancements, concerns persist regarding the effectiveness of NSSF's automated health systems in meeting beneficiaries' expectations. Khamis and Nhamo (2021) argue that poorly managed systems can precipitate dissatisfaction among insured members. While automation was expected to reduce waiting times, improve processing efficiency and enhance satisfaction levels; customer satisfaction

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is influenced not only by system availability but also by perceptions of reliability, security, trustworthiness and service quality dimensions.

The SERVQUAL model developed by Parasuraman et al. (1988), identifies five core dimensions of service quality: assurance, reliability, empathy, responsiveness and tangibility that applied across diverse service sectors to predict customer satisfaction. Within healthcare contexts, assurance and reliability emerge as particularly salient dimensions. Assurance encompasses the knowledge, courtesy and ability of service providers to inspire trust and confidence, while reliability refers to the ability to perform promised services dependably and accurately. Recent empirical evidence highlights that confidentiality and data protection are central to building patient trust in automated systems (Esmaeilzadeh, 2019), while accuracy and transparency improve user confidence (Williamson & Prybutok, 2024). Furthermore, trust mediates the relationship between service quality and satisfaction, underscoring the critical importance of assurance in digital healthcare adoption (Akter et al., 2013). Specifically, beneficiaries in Ilala district have reported dissatisfaction stemming from long waiting times, limited availability of specialized healthcare services, and inconsistent quality of care across different accredited healthcare providers (United Republic of Tanzania, 2024).

A critical examination of existing literature reveals significant research gaps. Previous studies have explored various dimensions of customer satisfaction within the NSSF context in Tanzania; focusing on general challenges, influencing factors and satisfaction levels (Kidola, 2022). However, these studies have largely overlooked the specific effects of service quality dimensions particularly assurance and reliability on customer satisfaction within automated health service processing procedures. This gap is problematic because automated systems fundamentally alter the service delivery landscape, introducing new dynamics in how service quality is perceived and experienced by beneficiaries. Understanding these dynamics is essential for optimizing system design, improving user experiences and ensuring that technological investments translate into meaningful satisfaction improvements. This study addresses these gaps by investigating the role of assurance and reliability dimensions in shaping satisfaction with automated health systems at NSSF Ilala, Dar es Salaam, Tanzania.

1.1 Statement of the Problem

NSSF extending health coverage to its members by partnered with accredited medical providers and adopted health systems to ensure efficient delivery of medical benefits, reduce waiting times, improve processing efficiency and to ensure customer satisfaction. However, despite these significant advancement in digital healthcare services in Ilala, Dar es Salaam; concerns persist regarding the effectiveness of enhancing customer satisfaction. The study suggests that, the quality dimensions especially assurance and reliability play crucial role in shaping customer satisfaction within automated healthcare system (Parasuraman et al., 1988). Existing studies on social health service delivery have largely overlooked these specific dimensions. This study addresses this gap by examining how assurance and reliability of automated health service's processing procedures influence customer satisfaction at NSSF Ilala, Dar es Salaam in order to inform improvements in digital healthcare delivery and optimize beneficiaries' outcomes.

1.2 Research Objective

To examine the influence of assurance and reliability in automated health services' processing procedures on customer satisfaction

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Service Quality (SERVQUAL) Model

The Service Quality (SERVQUAL) Model developed by Parasuraman et al. (1988), remains one of the most influential and widely applied frameworks for evaluating service quality and customer satisfaction across diverse service sectors. The model emerged from seminal research seeking to explain the gap between customer expectations and their perceptions of actual service delivery. It posits that service quality is fundamentally determined by the discrepancy between these two constructs what customers expect versus what they perceive they receive. The SERVQUAL model operationalizes this concept across five distinct dimensions: tangibles (physical facilities, equipment, and appearance of personnel), reliability (ability to perform the promised service dependably and accurately), responsiveness (willingness to help customers and provide prompt service), assurance (knowledge and courtesy of employees and their ability to inspire trust and confidence) and empathy (caring, individualized attention provided to customers). The model provides a structured framework for identifying and addressing gaps between customer expectations and actual service performance that enabling organizations to pinpoint specific areas requiring improvement (Ladhari, 2009). This diagnostic capability makes SERVQUAL particularly valuable for service quality management and continuous improvement initiatives. However, the model also has recognized limitations as it may not fully capture the complexities

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of service quality in different cultural contexts or adequately account for all factors influencing customer satisfaction in specific service environments (Al-Assaf et al., 2024)

Despite these limitations, recent scholarship has reinforced the continued relevance of SERVQUAL in contemporary digital healthcare contexts. Smith and Johnson (2021) demonstrate that SERVQUAL effectively assesses how healthcare automation aligns with patient expectations, providing valuable insights for system design and implementation. Similarly, (Alharbi et al., 2024) emphasize the need for contextual adaptation when measuring service quality in evolving technological environments, suggesting that while the core dimensions remain relevant, their operationalization may require adjustment for digital service contexts. In automated health systems, assurance and reliability emerge as particularly critical dimensions. Assurance that encompassing trust, security, and confidentiality; becomes paramount when personal health information is processed through digital platforms. Reliability that involving system consistency, accuracy and stability; directly affects user confidence in automated processes.

In the context of this study, which evaluates the role of assurance and reliability in automated health systems on customer satisfaction among NSSF beneficiaries in Ilala region, the SERVQUAL model provides a highly relevant theoretical framework. It allows for detailed analysis of how these specific dimensions of automated health systems align with beneficiaries' expectations and perceptions. By applying SERVQUAL, the study can systematically identify gaps in service delivery, assess the effectiveness of SHIB processing procedures and provider performance, and offer evidence-based, actionable insights to enhance customer satisfaction (Smith & Johnson, 2021). The model's focus on perceptual measures aligns well with the study's objective of understanding beneficiary experiences with automated systems, making it an appropriate theoretical lens for this investigation.

2.2 Empirical Review

2.2.1 Influence of Assurance and Reliability in Automated Processing Procedures on Customer Satisfaction

Empirical evidence increasingly demonstrates that assurance (encompassing trust, security and confidentiality) and reliability (involving consistency, accuracy and system stability) constitute central determinants of customer satisfaction in digital health contexts. However, findings vary across contexts and methodological approaches, revealing nuanced relationships between these service quality dimensions and satisfaction outcomes.

Ahmed et al. (2021) investigated the impact of Islamic Shariah compliance on customer satisfaction in Islamic banking services, focusing on service quality's mediating role. Using data from 384 respondents analyzed through SEM, findings revealed that service quality significantly mediated the relationship between Shariah compliance and customer satisfaction. While conducted in a banking rather than healthcare context, this study provides valuable insights into how assurance-related dimensions (trust, confidence in institutional integrity) operate in service sectors involving sensitive personal information and financial transactions. The banking-healthcare parallel is instructive because both sectors require high levels of trust and confidentiality, suggesting that assurance mechanisms proven effective in banking contexts may transfer to healthcare insurance applications.

Dagger et al. (2007) proposed a hierarchical approach to conceptualizing perceived service quality, suggesting that service quality operates at multiple levels including interaction quality, physical environment quality, and outcome quality. Their theoretical framework, while developed before widespread healthcare automation, provides valuable conceptual foundations for understanding how different service quality dimensions may operate with differential importance depending on service context. Applied to automated health insurance, their framework suggests that outcome quality (accuracy; reliability of processing results) and interaction quality (trust; assurance in system interactions) may constitute primary determinants of satisfaction, while physical environment quality becomes less relevant in digital contexts.

Ladhari (2009) conducted a comprehensive review of twenty years of SERVQUAL research, examining the model's applications across diverse service contexts and cultures. The review identified 429 articles using SERVQUAL, revealing widespread adoption but also highlighting contextual variations in dimension importance. Ladhari noted that reliability consistently emerged as the most critical dimension across service contexts, though its relative importance varied. Assurance's importance appeared particularly elevated in contexts involving risk, uncertainty, or sensitive information – characteristics that strongly apply to healthcare and health insurance services. This meta – analytic perspective supports the current study's focus on assurance and reliability as particularly salient dimensions in automated health insurance contexts.

Fenny et al. (2021) assessed social health insurance schemes across multiple African countries, examining outcomes and impacts on healthcare access and satisfaction. Their comprehensive review of health insurance implementations in Ghana, Kenya, Nigeria and Tanzania revealed common challenges including administrative inefficiencies, delayed claims processing, and inadequate communication with beneficiaries. The study emphasized that successful health insurance schemes require robust administrative systems characterized by reliability (consistent and timely processing) and assurance (transparent communication and trust-building). Importantly, their findings

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demonstrated that automated systems, when properly implemented; can address many administrative challenges while simultaneously requiring careful attention to data security and system stability to maintain beneficiary trust.

Mgaya and Gwahula (2024) examined the effect of service quality on customer satisfaction at St. Joseph Referral Hospital-Peramiho in Tanzania using Structural Equation Modeling (SEM) with 123 respondents. Their findings revealed that tangibility, reliability, responsiveness, assurance and empathy all had significant effects on customer satisfaction. Specifically, reliability demonstrated a strong positive association with customer satisfaction, with factor loadings exceeding 0.900 for reliability items. The study emphasized that healthcare services' unique nature requires consistent, dependable service delivery to maintain patient satisfaction. These findings from a Tanzanian healthcare context provide important baseline evidence for understanding service quality dynamics in East African healthcare settings.

Mboera et al. (2021) investigated the digital transformation of healthcare systems in Tanzania, identifying both opportunities and challenges in implementing automated health technologies. Their comprehensive review highlighted that while digital health initiatives offer potential for improved efficiency and accessibility, significant challenges exist including infrastructure limitations, technical capacity gaps, and user acceptance issues. The study emphasized that successful digital health implementation requires addressing both technical reliability concerns and building user trust through transparent, secure systems. These findings provide crucial context for understanding the specific challenges facing automated health insurance systems in Tanzania, where infrastructure and capacity constraints may affect both reliability and assurance dimensions.

Collectively, these empirical studies reveal three critical research gaps that the current study addresses. First, while assurance and reliability have been explored extensively in various digital health contexts internationally, limited empirical evidence exists specifically examining their influence within automated health insurance systems in Tanzania. The available Tanzanian studies (Mboera et al., 2021; Mgaya & Gwahula, 2024) focus on hospital – level systems or general digital health transformation rather than social health insurance automation.

Second, much existing literature has concentrated on general digital healthcare perceptions or hospital information systems, overlooking structured social health insurance schemes that involve complex interactions among fund administrators, accredited medical providers, and beneficiaries. These systems present unique service quality challenges distinct from direct healthcare delivery contexts. Third, while the SERVQUAL model has been applied across diverse service sectors, its application to automated health insurance in African contexts remains limited, leaving questions about dimensional importance and contextual adaptations unresolved.

This study therefore addresses these gaps by applying the SERVQUAL model to examine the specific influence of assurance and reliability dimensions on customer satisfaction with automated processing procedures in SHIB under the NSSF in Ilala, Dar es Salaam. In doing so, it contributes to deeper understanding of how automation affects efficiency, trust, and satisfaction in national health insurance systems while offering practical, evidence-based recommendations for strengthening automated health service delivery in Tanzania. The study extends existing knowledge by focusing on a previously underexplored context (national health insurance automation) and by explicitly examining the comparative influences of assurance versus reliability dimensions within this specific context.

III. METHODOLOGY

This study adopted a descriptive research design with a quantitative approach to examine the influence of service quality dimensions on customer satisfaction among NSSF beneficiaries. The descriptive research design was selected because it enables systematic description of characteristics of a population or phenomenon being studied, allowing researchers to assess current status of variables and their relationships without manipulation. This design involved collecting data at a single point in time to assess current levels of service quality perceptions and customer satisfaction, examining their relationships while maintaining objectivity. The quantitative approach emphasized the use of objective measurements, numerical data, and statistical analysis to test hypothesized relationships between variables (Creswell & Creswell, 2018).

The target population comprised social health insurance beneficiaries registered with NSSF and accessing services through the SHIB program in Ilala district, Dar es Salaam. According to NSSF regional records, approximately 490 active beneficiaries regularly utilized SHIB services in Ilala district during the study period. This population was selected because beneficiaries represent the primary users of automated processing systems and therefore possess direct experiential knowledge of service quality dimensions under investigation. Their perspectives are essential for understanding how automated systems perform in practice and how service quality influences satisfaction outcomes.

Sample size determination employed Yamane's (1967) formula, which is appropriate for finite populations in quantitative studies. The formula is expressed as:

$$n = N / (1 + Ne^2)$$

Where:

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n = Sample size
N =Population size of 490,
e = Margin of error (0.05)

Hence:

$n = 490 / (1+ 490 \times 0.05^2)$

n = 220

Therefore, the sample size for quantitative data collection was 220 NSSF beneficiaries. This sample size provides adequate statistical power for detecting meaningful relationships while remaining practically feasible for data collection within resource and time constraints.

Simple random sampling was employed to select the 220 beneficiaries from the sampling frame of 490 active SHIB users. This probability sampling technique ensures that each beneficiary in the population has an equal and independent chance of being selected, thereby minimizing selection bias and enhancing the representativeness of the sample (Ryman, 2021).

The sampling procedure involved obtaining the list of active beneficiaries from NSSF Ilala office, assigning each beneficiary a unique identification number, and using computer-generated random numbers to select participants. This approach strengthens the external validity of findings by ensuring the sample accurately reflects characteristics of the broader beneficiary population.

Data were collected through structured questionnaires designed specifically for this study. The questionnaire employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure respondents' perceptions of service quality dimensions and satisfaction levels. Likert scales are widely used in service quality research because they allow collection of standardized data measuring attitudes, perceptions, and opinions while minimizing researcher bias and variation in data collection, leading to more objective and comparable results (DeVellis, 2017). The questionnaire comprised four main sections: demographic characteristics (gender, age, marital status and education level), assurance-related items (security, confidentiality, trust and accuracy), reliability-related items (consistency, error frequency, cross-platform functionality), and customer satisfaction items (overall satisfaction, service quality perception and recommendation likelihood).

Instrument validity was established through multiple approaches. Content validity was achieved by having three experts in health management and service quality research thoroughly review questionnaire items. These experts assessed whether items adequately represented the constructs being measured and provided feedback for refinement. Their input confirmed that items effectively captured key dimensions of assurance, reliability, and customer satisfaction. Face validity was established by pre-testing the survey instrument with 22 participants (10% of the sample size), following recommendations by DeVellis (2017). This pilot test verified that items were clear, understandable, and relevant to respondents' experiences with automated SHIB services. Feedback from pilot participants led to minor wording adjustments to enhance clarity and cultural appropriateness.

Instrument reliability was assessed using Cronbach's alpha coefficient, with a threshold set at $\alpha > 0.70$ as recommended for social science research (Nunnally & Bernstein, 1994). This statistical measure evaluates internal consistency of survey items, ensuring that items within each scale consistently measure the same underlying construct. Pilot test results yielded Cronbach's alpha values of 0.86 for assurance items, 0.82 for reliability items, and 0.88 for customer satisfaction items, all exceeding the 0.70 threshold and indicating satisfactory reliability. These reliability coefficients provide confidence that the measurement instrument consistently captures the intended constructs across different respondents.

Data analysis employed both descriptive and inferential statistical techniques using the Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated to summarize demographic characteristics and describe levels of assurance, reliability, and customer satisfaction among respondents. These descriptive analyses provide foundational understanding of the sample composition and variable distributions. Inferential statistics, specifically multiple regression analysis, were employed to test hypothesized relationships between independent variables (assurance and reliability) and the dependent variable (customer satisfaction). Multiple regression analysis is appropriate because it allows simultaneous examination of multiple predictors' effects on an outcome variable while controlling for other factors, providing coefficients that indicate the strength and direction of relationships (Field, 2013).

Prior to regression analysis, diagnostic tests were conducted to verify that data met statistical assumptions. These included tests for normality (Kolmogorov-Smirnov test), linearity (scatterplots), multicollinearity (Variance Inflation Factor), and homoscedasticity (residual plots). All assumptions were satisfactorily met, supporting the appropriateness of regression analysis for hypothesis testing.

The study upheld rigorous ethical standards throughout all research phases. Research clearance was obtained from the College of Business Education research ethics committee and permission was secured from NSSF headquarters and Ilala regional office to access beneficiaries and conduct the study. Informed consent was obtained from all

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participants before data collection, with clear explanations provided regarding study purposes, voluntary participation, right to withdraw, and data confidentiality. Participants' identities and personal information were kept strictly confidential, with no names or identifying information disclosed in data presentation or reporting. Data were stored securely and accessed only by research team members. These ethical practices ensure protection of participants' rights and well-being while maintaining research integrity and credibility.

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics of Respondents

This section presents demographic characteristics of the 220 NSSF beneficiaries who participated in this study. Understanding demographic composition provides important context for interpreting findings and assessing the representativeness of the sample relative to the broader beneficiary population. Demographic variables examined include gender, marital status, age and education level, all of which may influence perceptions of service quality and satisfaction with automated health systems. The demographic profile of the 220 NSSF beneficiaries reveals a representative sample of active social health insurance users in Ilala, Dar es Salaam.

4.1.1 Gender of Respondent

Gender distribution was nearly balanced; with females slightly outnumbering males (50.9% vs. 49.1%) as shown in Table 1, ensuring inclusivity of perspectives and minimizing potential gender bias in service quality evaluations. Research suggests that gender may influence healthcare service expectations and satisfaction evaluations (Ahmed et al., 2021); hence making balanced representation methodologically important.

Table 1

Gender of Respondents

Gender	Frequency	Percent %
Male	108	49.1
Female	112	59.9
Total	**220**	**100.0**

4.1.2 Marital Status of Respondent

From table 2 below, it shows that the majority of respondents were married (81.4%), suggesting they likely manage healthcare needs for multiple family members, which increases their interaction frequency with automated SHIB systems and enhances the depth of their experiential insights. Married individuals, particularly those with dependents covered under SHIB, may have heightened awareness of and engagement with health insurance processes and service quality.

Table 2

Marital Status of Respondents

Marital Status	Frequency	Percent %
Single	36	16.4
Married	179	81.4
Divorced	4	1.8
Widow	1112	0.5
Total	**220**	**100.0**

4.1.3 Age of Respondent

Age distribution concentrated in economically active groups, with the largest proportion aged 36-45 years (47.3%), followed by 26-35 years (36.4%) and 46-55 years (16.4%) as shown in Table 3. This working-age demographic represents core NSSF contributors who regularly engage with automated health insurance services and possess sufficient digital literacy to navigate technological systems effectively. These age groups are particularly relevant because they are likely to be digital technology users with experience navigating automated systems; making their evaluations of automated health insurance services especially informative.

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Table 3
Age of Respondents

Age of Respondents	Frequency	Percent %
26 – 35	80	36.4
36 – 45	104	47.3
46 – 55	36	16.4
Total	**220**	**100.0**

4.1.4 Age of Respondent

In Table 4 it shows that, educational attainment was notably high, with over three-quarters holding university degrees (76.4%), while 16.4% completed secondary education and 7.3% attended college. This educational profile indicates that most respondents possessed substantial educational backgrounds, likely conferring adequate literacy, technological competence, and capacity to navigate automated systems (DeVellis, 2017). Higher education levels may correlate with higher service quality expectations and more sophisticated evaluations of system performance. The predominance of university-educated respondents suggests the sample comprises individuals capable of providing nuanced, informed assessments of service quality dimensions. However, this educational skew also constitutes a potential limitation, as the sample may underrepresent less educated beneficiaries who might experience different challenges or hold different perceptions regarding automated systems.

Table 4
Education Level of Respondents

Level of Education	Frequency	Percent %
Secondary	36	16.4
College	16	7.3
University	168	76.4
Total	**220**	**100.0**

4.2 Descriptive Analysis: Influence of Assurance and Reliability on Customer Satisfaction

Table 5 presents comprehensive descriptive statistics for all items measuring assurance, reliability and their perceived influence on customer satisfaction. Note: SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

Table 5
Descriptive Statistics for Assurance and Reliability Dimensions

Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)	Mean	SD
The automated system ensures security and confidentiality of my data	30.9	56.4	10.9	0.0	1.8	4.15	0.75
The automated service processes are accurate	23.6	63.6	9.1	3.6	0.0	4.07	0.68
Automated systems are consistent and rarely experience technical failures	10.9	52.7	25.5	9.1	1.8	3.62	0.86
Automated system functions reliably across different times and platforms	23.6	58.2	12.7	3.6	1.8	3.98	0.82
I trust the quality and outcome of the automated processing procedure	34.5	47.3	10.9	3.6	3.6	4.05	0.96
Overall Mean						**3.97**	

Data collected were analyzed using descriptive statistics including mean scores and standard deviations, providing insights into respondents' perceptions of assurance and reliability dimensions within NSSF's automated healthcare systems. To facilitate interpretation, mean values were mapped to descriptive categories using the following scale: 1.00-1.80 = Strongly Disagree; 1.81-2.60 = Disagree; 2.61-3.40 = Neutral; 3.41-4.20 = Agree; 4.21-5.00 = Strongly Agree. This interpretation framework allows clear understanding of whether respondents generally agree or disagree with statements regarding service quality dimensions.

The descriptive findings presented in Table 5 reveal several important patterns regarding how beneficiaries perceive assurance and reliability dimensions of automated processing procedures at NSSF. First, regarding assurance-related perceptions, a substantial majority of respondents expressed strong agreement that the automated system ensures security and confidentiality of their data (mean = 4.15, SD = 0.75). Specifically, 87.3% of respondents either agreed or strongly agreed with this statement, indicating widespread confidence in data protection mechanisms. This finding is encouraging as it suggests that NSSF's automated systems have successfully established foundational trust; regarding information security which constitutes a critical prerequisite for trust in digital health systems Dagger et al., (2007).

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Similarly, perceptions of process accuracy were highly positive, with a mean score of 4.07 (SD = 0.68). Approximately 87.2% of respondents agreed or strongly agreed that automated service processes are accurate, suggesting that the system generally performs its intended functions correctly and produces reliable outputs. This perception of accuracy is crucial because it directly relates to the reliability dimension of service quality and influences users' willingness to trust and depend on automated processes rather than preferring manual alternatives (Meena & Sahu, 2022). The relatively low standard deviation (0.68) indicates substantial consensus among respondents regarding process accuracy, further strengthening confidence in this finding.

Respondents also expressed strong trust in the quality and outcomes of automated processing procedures (mean = 4.05, SD = 0.96). With 81.8% of respondents agreeing or strongly agreeing with this statement, it is evident that beneficiaries have developed confidence in the automated system's ability to deliver appropriate outcomes. However, the slightly higher standard deviation (0.96) suggests somewhat more variability in trust levels compared to perceptions of security and accuracy, indicating that while most beneficiaries trust the system, a meaningful minority harbor reservation. This variability may reflect differential experiences with system performance or individual differences in propensity to trust technological systems.

In contrast to the strong performance on assurance-related dimensions, reliability perceptions revealed more moderate results with greater variability. The statement "Automated systems are consistent and rarely experience technical failures" received the lowest mean score of 3.62 (SD = 0.86), falling in the "Agree" range but notably lower than assurance-related items. Only 63.6% of respondents agreed or strongly agreed with this statement, while 25.5% remained neutral and 10.9% disagreed or strongly disagreed. This finding suggests that technical failures and system inconsistencies constitute meaningful problems affecting user experiences. The relatively high standard deviation (0.86) indicates considerable variation in experiences, likely reflecting that some users encounter technical problems more frequently than others.

System reliability across different times and platforms received a mean score of 3.98 (SD = 0.82), indicating generally positive but not uniformly strong perceptions. Approximately 81.8% of respondents agreed or strongly agreed that the system functions reliably across different contexts, suggesting that cross-platform functionality and temporal consistency are generally satisfactory. However, 12.7% remained neutral and 5.4% disagreed, indicating that accessibility and consistency issues persist for a non-trivial minority of users. The moderate standard deviation suggests reasonable consensus while acknowledging meaningful variation in experiences.

The overall mean score across all five items was 3.97, falling in the "Agree" category and indicating that beneficiaries generally perceive both assurance and reliability dimensions positively. However, this aggregate score masks important variation between dimensions, with assurance-related items (security, accuracy, trust) scoring higher than reliability-related items (consistency, technical failures, cross-platform functionality). This pattern suggests that while NSSF's automated system has successfully established trust and confidence through strong assurance mechanisms, reliability challenges related to technical performance and system stability require attention and improvement. These descriptive findings provide essential context for interpreting the regression results that follow; highlighting both strengths to maintain and weaknesses to address in NSSF's automated health service delivery.

4.3 Descriptive Analysis for Customer Satisfaction

Tables 6 presents descriptive analysis for customer satisfaction.

Table 6

Service Quality Statements on Customer Satisfaction in Automated Health Systems

Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)	Mean	SD
The automated system ensures security and confidentiality of my data	30.9	56.4	10.9	0.0	1.8	4.15	0.75
The automated service processes are accurate	23.6	63.6	9.1	3.6	0.0	4.07	0.68
Automated systems are consistent and rarely experience technical failures	10.9	52.7	25.5	9.1	1.8	3.62	0.86
Automated system functions reliably across different times and platforms	23.6	58.2	12.7	3.6	1.8	3.98	0.82
I trust the quality and outcome of the automated processing procedure	34.5	47.3	10.9	3.6	3.6	4.05	0.96
Overall Mean	–	–	–	–	–	**3.97**	–

The findings in Table 6 reveal that respondents had favourable perceptions of the service quality attributes of automated health systems, which directly influenced customer satisfaction. The highest mean score (4.15) was recorded for the statement regarding data security and confidentiality. This indicates that most users felt confident that their personal and medical information was protected within the automated system. Such trust in data protection enhances

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user satisfaction, a finding consistent with Mboera et al. (2021), who observed that confidentiality assurance in digital health platforms increases patient confidence and service utilisation.

Accuracy also emerged as a key satisfaction driver (Mean = 4.07), with the majority agreeing that automated service processes are precise and reliable. This aligns with Fenny et al. (2021), who reported that accuracy and timeliness in automated systems strengthen users' trust and improve satisfaction levels. However, while many users agreed that the systems were consistent and rarely failed (Mean = 3.62), a quarter remained neutral, suggesting that occasional technical challenges still affect some users' experiences. Mgaya and Gwahula (2024) similarly noted that system interruptions and interface issues can reduce satisfaction despite overall reliability.

Furthermore, respondents perceived that the system functions reliably across different times and platforms (Mean = 3.98), implying accessibility and operational stability, both of which enhance satisfaction. Finally, trust in the automated processing outcomes (Mean = 4.05) further reinforced users' confidence in the technology, consistent with Mboera et al. (2021), who found that perceived system trustworthiness is crucial for sustaining user satisfaction in digital health environments.

Overall, with an aggregate mean of 3.97, the results suggest that service quality dimensions—security, accuracy, reliability, and trust play a significant role in shaping customer satisfaction with automated health systems. These findings empirically confirm that high-quality automated services lead to greater satisfaction by ensuring reliability, confidentiality, and consistency in healthcare delivery.

4.4 Regression Analysis Results

Multiple regression analysis was conducted to examine the predictive effects of assurance and reliability on customer satisfaction among NSSF beneficiaries. This analytical approach allows simultaneous assessment of how each independent variable influences the dependent variable while controlling for the other predictor, providing insights into their relative importance and unique contributions. Table 6 presents the complete regression analysis results, including standardized beta coefficients, t-values, significance levels, and model fit statistics.

Table 6

Multiple Regression Analysis Results

Model Summary				
Statistic	**Value**			
R	0.671			
R^2	0.45			
Adjusted R^2	0.442			
F-Statistic	F(2, 217) = 121.62			
p-value	p < 0.001			
Notes	*** p < 0.001; ** p < 0.01			
Regression Analysis				
Predictor Variable	**Beta (β)**	**t-value**	**Sig. (p)**	**Interpretation**
Assurance (security, accuracy, trust)	0.482	6.912	0.000***	Highly significant
Reliability (consistency, error-free operation)	0.317	4.256	0.001**	Significant

The regression analysis results reveal several important findings regarding the relationships between service quality dimensions and customer satisfaction. First, the overall regression model was statistically significant ($F = 121.62$, $p < 0.001$), indicating that the model as a whole effectively predicts customer satisfaction. The model's explanatory power, represented by $R^2 = 0.450$, demonstrates that assurance and reliability jointly account for 45.0% of the variance in customer satisfaction among NSSF beneficiaries. This represents a substantial proportion of explained variance, suggesting these two service quality dimensions are indeed critical determinants of satisfaction outcomes. The adjusted R^2 value of 0.442 remains strong even after accounting for the number of predictors, confirming the robustness of the model. The remaining 55% of unexplained variance suggests that other factors not included in this model such as empathy, responsiveness, tangibility, or individual difference variables also influence customer satisfaction and warrant investigation in future research.

Examining individual predictors, assurance emerged as the stronger predictor of customer satisfaction ($\beta = 0.482$, $t = 6.912$, $p < 0.001$). The positive standardized beta coefficient indicates that for every one standard deviation increase in assurance perceptions, customer satisfaction increases by 0.482 standard deviations, holding reliability constant. This effect is both statistically significant at the $p < 0.001$ level and practically meaningful given its magnitude. The t-value of 6.912 substantially exceeds critical values, providing strong evidence against the null hypothesis of no relationship. These findings indicate that assurance dimensions encompassing security, confidentiality, accuracy, and trust—exert powerful influence on beneficiary satisfaction with automated health insurance services.

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Reliability also demonstrated a significant positive effect on customer satisfaction (β = 0.317, t = 4.256, p = 0.001), though its influence was weaker than assurance. The standardized coefficient indicates that for every one standard deviation increase in reliability perceptions, customer satisfaction increases by 0.317 standard deviations when controlling for assurance. While this effect is smaller in magnitude than assurance, it remains statistically significant and practically important. The t-value of 4.256 provides strong evidence of a genuine relationship. These findings confirm that system consistency, technical stability, and error-free operation significantly contribute to beneficiary satisfaction, supporting theoretical expectations regarding the importance of reliability in service quality frameworks.

The differential magnitudes of effects (β = 0.482 for assurance versus β = 0.317 for reliability) provide important insights into the relative importance of these dimensions within NSSF's automated health context. Assurance's stronger influence suggests that building trust, ensuring security, and establishing confidence in system outcomes may be more immediately impactful for satisfaction than achieving perfect technical reliability. This pattern may reflect that beneficiaries prioritize knowing their sensitive health information is protected and that system outputs are trustworthy over experiencing absolutely flawless technical performance. However, reliability's significant contribution demonstrates that technical performance still matters substantially; beneficiaries value consistent, stable system operation alongside trust and security.

These regression findings directly address the study's research objective by empirically demonstrating that both assurance and reliability in automated processing procedures significantly and positively influence customer satisfaction among NSSF beneficiaries in Ilala. The results support the theoretical framework derived from the SERVQUAL model, confirming that these service quality dimensions are indeed critical determinants of satisfaction in automated health insurance contexts. The strong model fit and significant predictors provide robust empirical evidence for the importance of these dimensions; offering clear direction for quality improvement initiatives.

4.5 Discussion

This section synthesizes and interprets the study findings in relation to the research objectives, theoretical framework, and existing empirical literature. The discussion examines how findings align with or diverge from previous research, explores theoretical implications, and highlights practical significance for improving automated health insurance services. The primary objective of this study was to examine the influence of assurance and reliability dimensions in automated processing procedures on customer satisfaction among NSSF beneficiaries accessing SHIB services in Ilala, Dar es Salaam.

4.5.1 Assurance as a Critical Determinant of Customer Satisfaction

The findings reveal that assurance constitutes the most critical determinant of customer satisfaction within NSSF's automated healthcare services, evidenced by its strong positive relationship (β = 0.482, p < 0.001) with satisfaction outcomes. This finding aligns closely with existing empirical evidence from multiple contexts while also revealing context-specific patterns worthy of detailed examination.

The strong relationship between assurance and satisfaction found in this study (β = 0.482) is notably consistent with findings from Mboya et al.'s (2024) research in Tanzania's Court of Appeal, where assurance significantly predicted customer satisfaction (β = 0.196, p = 0.001) among court advocates using automated judicial services. While the effect size in the current study is larger, both studies demonstrate that Tanzanian users of automated public services prioritize trust, security, and confidence when evaluating their satisfaction. This convergence across different public service sectors (health insurance versus judicial services) suggests that assurance may constitute a particularly critical service quality dimension in Tanzanian contexts, possibly reflecting broader societal values emphasizing trust and interpersonal relationships even in technological interactions.

The finding that accuracy significantly influences customer satisfaction (M = 4.07) resonates with broader service quality literature emphasizing the importance of outcome reliability. Dagger et al., (2007) argued in their hierarchical service quality model that outcome quality the "what" of service delivery constitutes a primary dimension distinct from interaction and environment quality. In automated health insurance contexts, outcome quality manifests primarily through processing accuracy: whether claims are assessed correctly, eligibility determinations are accurate, and system outputs are reliable.

The current study's findings demonstrate that NSSF's automated system generally achieves strong accuracy perceptions, contributing positively to beneficiary satisfaction. This accuracy is particularly important in health insurance contexts where processing errors can have serious consequences for beneficiaries' access to healthcare services and financial protection.

The strong trust levels observed in this study (M = 4.05) also align with Ahmed et al.'s (2021) research in Islamic banking, which demonstrated that service quality significantly mediates relationships between institutional credibility and customer satisfaction. While their study focused on Shariah compliance rather than technological automation, the underlying dynamics are instructive: customers in high-stakes service contexts (financial services and health insurance)

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prioritize institutional trustworthiness when evaluating satisfaction. When customers trust that institutions will protect their interests, handle their sensitive information appropriately, and deliver promised outcomes, satisfaction increases substantially. The parallel between banking and health insurance contexts suggests that assurance mechanisms operate similarly across service sectors involving sensitive personal information and significant financial or health consequences.

Interestingly, the current study's strong findings regarding assurance's importance contrast somewhat with (Mgaya and Gwahula, 2024) hospital study in Tanzania, where empathy emerged as the strongest predictor of satisfaction, followed by reliability, with assurance showing weaker effects. This divergence may reflect important contextual differences between hospital services and health insurance administration. Hospital contexts involve direct interpersonal interactions where empathy (caring and individual attention) becomes salient; while health insurance administration operates primarily through automated systems where interpersonal empathy is less relevant but trust in institutional processes becomes paramount. This contextual variation underscores the importance of adapting service quality frameworks to specific service delivery contexts rather than assuming uniform dimension importance across all healthcare-related services.

From a theoretical perspective, these findings strongly support the SERVQUAL model's identification of assurance as a core service quality dimension. Parasuraman et al.'s (1988) original conceptualization emphasized that assurance encompasses "knowledge and courtesy of employees and their ability to inspire trust and confidence." While the current study's automated context lacks traditional employee interactions, the core psychological construct—trust and confidence in service delivery remains central. The findings suggest that in automated systems; assurance dimensions require reconceptualization to emphasize data security, algorithmic accuracy and trust in automated processes rather than traditional interpersonal courtesy. This adaptation represents an important theoretical contribution, extending the SERVQUAL framework to contemporary digital service contexts while maintaining its core insights about the psychological importance of trust and confidence in service experiences.

4.5.2 Reliability's Significant but Weaker Influence on Customer Satisfaction

While reliability demonstrated a significant positive relationship with customer satisfaction ($\beta = 0.317$, $p = 0.001$), its influence was notably weaker than assurance. This finding reveals important nuances in how different service quality dimensions operate within automated health insurance contexts and aligns with several patterns observed in existing literature while also revealing context-specific dynamics.

The descriptive statistics provide insights into why reliability's influence is attenuated: the lowest mean score ($M = 3.62$) was recorded for system consistency and absence of technical failures, indicating that technical reliability issues constitute meaningful problems affecting user experiences. These findings closely parallel those of Mboya et al. (2024) in their Court of Appeal study, where reliability significantly predicted satisfaction ($\beta = 0.280$, $p < 0.001$) but with somewhat weaker effects than other dimensions. The consistency across studies suggests that technical reliability challenges may be systemic across Tanzania's automated public services, potentially reflecting broader infrastructure limitations and technical capacity constraints identified by Mboera et al. (2021) in their comprehensive review of digital health transformation in Tanzania.

Mboera et al. (2021) documented that Tanzania faces significant challenges in digital health implementation, including inconsistent electricity supply, variable internet connectivity, limited technical expertise, and insufficient maintenance resources. These infrastructure and capacity constraints directly affect system reliability, creating the occasional downtimes and technical failures that respondents in the current study reported experiencing. The fact that 10.9% of respondents disagreed that systems rarely experience technical failures, while 25.5% remained neutral, indicates that reliability problems are sufficiently common to affect approximately one-third of users. This pattern suggests that infrastructure improvements and technical capacity development represent necessary prerequisites for enhancing reliability dimensions of automated health services.

Despite its weaker relative influence, reliability's significant contribution ($\beta = 0.317$) should not be minimized. This effect size represents a meaningful proportion of explained variance and demonstrates that technical performance genuinely matters to beneficiaries. The finding aligns with Mgaya and Gwahula's (2024) research at St. Joseph Hospital, where reliability items showed factor loadings exceeding 0.900, indicating strong measurement quality and conceptual clarity. Their study emphasized that reliability the ability to perform promised services dependably and accurately—constitutes a fundamental requirement for customer satisfaction in healthcare contexts. Even when other dimensions perform well; reliability failures undermine overall satisfaction.

The finding regarding cross-platform reliability ($M = 3.98$) provides additional nuance. While this score is higher than the score for technical failure frequency, it still falls below assurance – related scores, suggesting that consistency across different access points and times remains an area requiring improvement. This finding is particularly relevant given Tanzania's diverse technological infrastructure. Beneficiaries may access NSSF systems through different devices (desktop computers at workplaces, personal laptops, tablets and smartphones); different locations (urban offices

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with stable internet and rural areas with variable connectivity) and different network conditions. Ensuring consistent, reliable performance across these varied contexts presents technical challenges that require sophisticated system design, robust testing protocols, and redundancy mechanisms.

The differential effects of assurance (β = 0.482) versus reliability (β = 0.317) raise interesting theoretical questions about dimension hierarchies in service quality models. Ladhari's (2009) comprehensive review of SERVQUAL research noted that reliability typically emerges as the most critical dimension across service contexts. However, the current study's findings suggest that in automated systems involving sensitive personal information and high-stakes outcomes (health insurance), assurance may supersede reliability in importance. This pattern might reflect a hierarchical need structure: users require basic assurance (trust, security and confidence) before reliability concerns become salient. If users fundamentally distrust a system or doubt its security; even perfect technical reliability may not generate satisfaction. Conversely, strong assurance can partially compensate for occasional reliability lapses, as users who trust the system's intentions and security may tolerate technical problems more readily.

This conceptualization aligns with Herzberg's two – factor theory of motivation; which distinguishes between hygiene factors (necessary to prevent dissatisfaction but insufficient to create satisfaction) and motivators (capable of actively creating satisfaction). Applied to automated health insurance, reliability may function more as a hygiene factor: when it falls below acceptable thresholds; it creates dissatisfaction but perfect reliability beyond baseline expectations may not substantially enhance satisfaction. In contrast, assurance may function more as a motivator: higher levels of trust, security and confidence actively create increased satisfaction beyond baseline levels. This theoretical integration suggests fruitful directions for future research examining dimensional hierarchies and nonlinear effects in service quality models.

4.5.3 Integrated Interpretation: The Complementary Roles of Assurance and Reliability

Examining assurance and reliability jointly provides the most comprehensive understanding of their influences on customer satisfaction. The overall positive mean perception (M = 3.97) and the significant regression model (R^2 = 0.450, F = 121.62, $p < 0.001$) demonstrate that together, these dimensions function as strong predictors of customer satisfaction in automated health insurance contexts. The model's ability to explain 45% of satisfaction variance represents substantial predictive power, particularly given that only two of five SERVQUAL dimensions were examined.

The findings align well with Fenny et al.'s (2021) comprehensive assessment of social health insurance schemes across Africa, which emphasized that successful schemes require both robust administrative reliability and strong beneficiary trust. Fenny and colleagues documented that African health insurance schemes face common challenges including administrative inefficiencies and communication gaps that undermine both reliability and assurance. However, they also identified successful examples where investments in automated systems, coupled with transparency initiatives and beneficiary education; substantially improved both efficiency and trust. The current study's findings suggest that NSSF has made progress on assurance dimensions while facing ongoing reliability challenges.

The complementary nature of assurance and reliability aligns well with theoretical predictions from the SERVQUAL model, which conceptualizes service quality as multidimensional and recognizes that different dimensions address different aspects of customer needs and experiences. Parasuraman et al. (1988) emphasized that comprehensive service quality assessment requires attention to multiple dimensions simultaneously as customers evaluate services holistically rather than focusing exclusively on single attributes. The current study's findings support this multidimensional perspective while revealing that dimensions may have differential importance within specific contexts.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that both factors are essential to satisfaction, with assurance covering security, confidentiality, accuracy and trust having a stronger influence. Beneficiaries expressed confidence in the system’s data protection and accuracy; indicating that NSSF has successfully built trust in its automated services. However, issues related to system reliability such as technical failures and performance inconsistencies were found to reduce satisfaction for some users; suggesting a need for improvement in system stability and technical support.

The study confirms the importance of assurance and reliability as key dimensions of service quality within automated health insurance systems. It highlights that assurance builds trust while reliability ensures consistent performance both of which are vital for user satisfaction. Practically, NSSF and similar organisations should maintain their strong assurance measures while focusing on improving reliability through better infrastructure, technical maintenance, and staff training. By addressing these areas; automated health services can achieve higher quality, increased customer satisfaction and greater confidence among beneficiaries.

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5.2 Recommendations

The study recommends that NSSF maintain its strengths in assurance by reinforcing data security, confidentiality and transparency within its automated health insurance services. This should include adherence to international security standards, regular audits and clear communication about data use and protection. Accuracy should also be safeguarded through validation checks and regular reviews to sustain the high level of trust and satisfaction among beneficiaries.

At the same time, NSSF should focus on improving reliability by enhancing system stability, introducing real-time monitoring and ensuring backup mechanisms to minimise technical failures. Strengthening technical capacity through staff training and recruitment alongside beneficiary education on system use; will further enhance service delivery. In the short term, resources should prioritise reliability improvements; followed by longer – term assurance enhancements to maintain trust and achieve consistent customer satisfaction.

REFERENCES

Ahmed, S., Mohiuddin, M., Rahman, M., Tarique, K. M., & Azim, M. (2021). The impact of Islamic Shariah compliance on customer satisfaction in Islamic banking services: Mediating role of service quality. *Journal of Islamic Marketing, 13*(9), 1829–1842.

Akter, S., Ray, P., & D'Ambra, J. (2013). Continuance of mHealth services at the bottom of the pyramid: The roles of service quality and trust. *Electronic Markets, 23*(1), 29–47.

Al-Assaf, K., Bahroun, Z., & Ahmed, V. (2024, December). Transforming service quality in healthcare: A comprehensive review of healthcare 4.0 and its impact on healthcare service quality. *Informatics, 11*(4), 96. MDPI.

Alharbi, S. H., Alzahrani, A. M., Syed, T. A., & Alqahtany, S. S. (2024). Integrity and privacy assurance framework for remote healthcare monitoring based on IoT. *Computers, 13*(7), 164.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Dagger, T. S., Sweeney, J. C., & Johnson, L. W. (2007). A hierarchical model of health service quality: Scale development and investigation of an integrated model. *Journal of Service Research, 10*(2), 123–142.

DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Sage Publications.

Esmaeilzadeh, P. (2019). The impacts of the perceived transparency of privacy policies and trust in providers for building trust in health information exchange: Empirical study. *JMIR Medical Informatics, 7*(4), e14050. https://doi.org/10.2196/14050

Fenny, A. P., Asante, F. A., Arhinful, D., & Kusi, A. (2021). Social health insurance schemes in Africa: Assessing outcomes and impacts. *Health Policy and Planning, 36*(1), 46–59. https://doi.org/10.1093/heapol/czaa113

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). Sage Publications.

Khamis, N., & Nhamo, G. (2021). Social health insurance and healthcare access in Africa: Evidence from Tanzania. *African Journal of Economic and Management Studies, 12*(4), 543–560. https://doi.org/10.1108/AJEMS-09-2020-0467

Kidola, M. (2022). Customer satisfaction with social health insurance benefits in Tanzania: Evidence from NSSF. *Tanzania Journal of Development Studies, 22*(1), 77–92.

Kwesigabo, G., Mwangu, M., Kakoko, D., & Killewo, J. (2019). Health system challenges in Tanzania and the role of social security funds. *East African Journal of Public Health, 16*(2), 89–96.

Ladhari, R. (2009). A review of twenty years of SERVQUAL research. *International Journal of Quality & Service Sciences, 1*(2), 172–198. https://doi.org/10.1108/17566690910971445

Mboera, L. E. G., Rumisha, S. F., Lyimo, E. P., & Chiduo, M. G. (2021). Digital transformation of healthcare systems in Tanzania: Opportunities and challenges. *BMC Health Services Research, 21*, 788.

Mboya, E., Dev, J., & Dominic, T. (2024). The influence of service quality dimensions on customer satisfaction in the Court of Appeal of Tanzania. *ORSEA Journal, 14*(2), 71–88. https://doi.org/10.56279/orseaj.v14i2.5

Meena, K. S., & Sahu, P. (2022). Perceived accuracy and satisfaction in automated hospital systems: Evidence from India. *Health Information Science and Systems, 10*(1), 1–12. https://doi.org/10.1007/s13755-021-00173-9

Mgaya, T. W., & Gwahula, R. (2024). The effect of service quality on customer satisfaction at St. Joseph Referral Hospital-Peramiho, Tanzania. *European Journal of Theoretical and Applied Sciences, 2*(2), 223–233. https://doi.org/10.59324/ejtas.2024.2(2).19

Mtebe, J. S., & Nakaka, R. (2019). Assessing adoption and impact of automated hospital information systems on service quality in Tanzania. *International Journal of Education and Development using ICT, 15*(3), 79–97.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

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Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12–40.

Ryman, S. (2021). Sampling strategies in social science research. *Research Methods Quarterly, 14*(2), 45–60.

Smith, T., & Johnson, K. (2021). Applying SERVQUAL in digital healthcare: Insights for system design and patient satisfaction. *Journal of Service Theory and Practice, 31*(5), 785–803. https://doi.org/10.1108/JSTP-09-2020-0220

United Republic of Tanzania. (2024). *Annual health sector performance report 2023/24*. Ministry of Health, Community Development, Gender, Elderly and Children. Dar Es Salaam: Government Printers.

Williamson, S. M., & Prybutok, V. (2024). Balancing privacy and progress: A review of privacy challenges, systemic oversight, and patient perceptions in AI-driven healthcare. *Applied Sciences, 14*(2), 675.

World Health Organization. (2020). *Global strategy on digital health 2020–2025*. https://www.who.int/docs/default-source/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf

Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). Harper & Row.

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The influence of strategic solutions on the performance improvement of NGOs in Morogoro, Tanzania

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ABSTRACT

This study investigates the influence of strategic solutions on the performance improvement of Non-Governmental Organizations (NGOs) in Morogoro, Tanzania. Guided by an integrated theoretical framework combining the Resource-Based View and Stakeholder Theory, the research examined the effects of leadership commitment and resource allocation on organizational performance. A sequential explanatory mixed-methods design was employed. The study targeted a population of 473 NGO managers, from which a systematic sample of 217 respondents was selected for a quantitative survey, supplemented by 55 purposively sampled in-depth interviews. Quantitative data were analyzed using descriptive statistics and multiple regression in SPSS, and qualitative data were analyzed using thematic analysis in NVivo. The results demonstrated that leadership commitment ($\beta = 0.333$, $p < 0.001$) and resource allocation ($\beta = 0.427$, $p < 0.001$) were significant predictors of organizational performance, jointly explaining 55.8% of its variance. Resource allocation emerged as the strongest determinant. The study concludes that strategic leadership and efficient resource management are paramount for enhancing NGO performance in resource-constrained settings. It recommends policy interventions such as mandatory leadership certification and fiscal incentives for diversified local funding to build organizational resilience, reduce donor dependency, and improve sustainable impact. Future research should adopt longitudinal and comparative approaches across multiple regions and incorporate objective performance metrics. Findings underscore the need for compulsory leadership certification programmes and strategic reforms in resource management, including tax incentives for local fundraising and performance-based allocation. These interventions can strengthen NGO governance, reduce donor dependency, and enhance sustainability in resource-constrained environments.

Keywords: Leadership, NGO Performance, Resource Optimization, Strategic Solutions

I. INTRODUCTION

The operational landscape for non-governmental organizations (NGOs) worldwide is one of escalating complexity, marked by burgeoning global needs, constricting financial resources, and intensified demands for demonstrable accountability (Banks et al., 2015). As pivotal actors in implementing the United Nations Sustainable Development Goals (SDGs), NGOs are under mounting pressure to demonstrate their effectiveness amid volatile funding streams and shifting donor priorities (Basilio, 2016). Despite channeling an estimated $2 trillion in annual development assistance, the global NGO sector continues to face profound scrutiny regarding the long-term sustainability and genuine impact of its investments (Bloodgood & Schmitz, 2024). This scrutiny is fueled by persistent, transnational challenges, including the existential threat of financial instability reported as the primary operational constraint by 60% of international NGOs (Li & Farid, 2023) a problem exacerbated since the 2008 financial crisis (Walton et al., 2016). Compounding this is a pervasive deficit in leadership and governance, with 54% of NGOs globally citing inadequate management capacity as a critical performance barrier (Manley, 2024). Furthermore, development effectiveness is consistently undermined by a disconnect between program design and local contexts, resulting in an estimated 30-40% of NGO projects failing to achieve their intended outcomes (Kwao & Amoak, 2022)

This global predicament finds particularly acute expression in Sub-Saharan Africa. Regional studies reveal alarming statistics that underscore a crisis of sustainability and governance. Approximately 63% of organizations grapple with severe donor dependency, while 58% report significant governance deficiencies that critically impair decision-making processes (Henry et al., 2023; Orwa & Odollo, 2023). These structural vulnerabilities yield concerning results: nearly 40% of development projects fail to achieve their intended impacts, and a mere 29% of interventions demonstrate viability beyond their initial funding cycles. These systemic weaknesses are further amplified by the region's unique socio-political and economic volatilities, with fluctuating political environments affecting 72% of NGOs

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and economic instability impacting 68%, thereby creating a perfect storm that fundamentally undermines developmental progress across the continent.

Within this regional panorama, Tanzania's NGO sector serves as a critical conduit for addressing pervasive socio-economic challenges, often complementing government efforts in delivering essential services like healthcare, education, and agricultural support to rural populations. Nevertheless, Tanzanian NGOs are not insulated from these systemic pressures. Empirical evidence indicates that local organizations frequently contend with profound obstacles, including extreme donor dependency, weak institutional governance, and a significant misalignment between project designs and authentic community needs, all of which collectively erode their capacity for sustainable impact (Temba, 2020;Onesmo & Mushi, 2022). While governmental interventions, such as the NGO Act of 2002 and its subsequent amendments, aim to bolster transparency and accountability, and while there are concerted efforts to foster community-NGO partnerships for enhanced program sustainability (Ezekiel, 2024), the operational environment remains decidedly challenging.

A pertinent theoretical framework for analyzing these performance challenges is the Resource-Based View (RBV). RBV contends that an organization's sustained competitive advantage and performance are predicated on its unique bundle of valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities (Barney, 1991). When applied to the Tanzanian NGO context, where tangible financial resources are perpetually scarce, the RBV lens usefully redirects focus towards the critical, yet often underutilized, intangible resources. Foremost among these is strategic leadership commitment. Conceptualized as the dedication, strategic vision, and proactive engagement of an organization's senior management, leadership commitment transcends mere administrative function; it is a strategic, internal resource that directly catalyzes performance. Emerging studies within Tanzania corroborate this view, highlighting that committed leadership is a pivotal factor in navigating turbulent environments, instilling a culture of accountability, and making strategic decisions that optimally leverage scarce resources (Kasanga & Mokaya, 2017; Mwita & Mrema, 2023). It is this committed leadership that acts as the essential catalyst for activating and orchestrating other organizational assets.

Consequently, this study is anchored in the investigation of the relationship between key strategic variables. The independent variables under examination are leadership commitment and resource allocation. The former encompasses the active involvement and strategic direction set by top management, while the latter, viewed through the RBV lens, refers to the strategic process of identifying, acquiring, and deploying both tangible and intangible resources to maximize value and align with strategic objectives. The dependent variable is NGO Organizational Performance, a multifaceted construct measured through indicators such as project goal achievement, stakeholder satisfaction, financial sustainability, operational efficiency, and organizational learning.

Despite a growing body of literature on NGO management, a critical gap persists in understanding how these strategic, resource-based factors interact to determine organizational performance in resource-constrained settings like Morogoro, Tanzania. Local NGOs are often caught in key tensions between donor dependence and local autonomy, structured and adaptive leadership, and centralized versus participatory decision-making (Kessy, 2025). Therefore, by analyzing the dynamics between leadership commitment, resource allocation, and organizational performance within Tanzania's specific socio-economic context, this research aims to provide actionable, evidence-based insights. The findings are anticipated to contribute meaningfully to scholarly discourse in development management and offer pragmatic strategies for enhancing sustainability, optimizing resources, and strengthening community collaboration for NGOs operating in similarly constrained environments across East Africa and beyond.

1.1 Statement of the Problem

Non-Governmental Organizations (NGOs) in Tanzania face serious challenges that limit their effectiveness and long-term sustainability. Across the country, issues such as heavy reliance on donors, weak governance, and inefficient operations are common. This is evidenced by the fact that over 30% of registered NGOs are inactive or have been closed due to poor financial management, and only about 35% of NGOs in Sub-Saharan Africa successfully achieve their project objectives (Henry et al., 2023; (NaCoNGO, 2023). Although the National NGO Policy of 2001 was created to guide the sector, its implementation has been weak. For instance, 78% of NGOs still depend heavily on foreign funding, and only 22% have met half of the policy's required standards (NaCoNGO, 2023).

Recent research points to two core problems that contribute to this situation: First, there is a significant gap in leadership skills, with about half of all NGO managers lacking formal training in strategic management (Allu et al., 2024). Second, resources are often poorly managed, with nearly 70% of NGOs failing to optimally use their funds and assets (Kaputa & Simon, 2024). Furthermore, while these national studies effectively identify broad challenges, they do not examine how the three issues, such as leadership, community engagement, and resource management, interconnect and influence each other at the local level. This represents a significant gap, especially for the Morogoro region. The specific social and economic environment in Morogoro likely shapes how these challenges unfold, but there is a lack of detailed research on this topic. Previous studies have examined these issues separately at the national scale but have not

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combined them to create a practical, integrated model for a specific region like Morogoro. Therefore, the purpose of this study is to fill this gap by examining how leadership capacity, stakeholder engagement, and resource optimization work together to influence the sustainable performance of NGOs in Morogoro. The results of this research are intended to provide a practical, evidence-based framework to help local NGOs, practitioners, and policymakers improve performance and strengthen the development contributions of the civil society sector in Morogoro.

1.2 Research Objectives

i. To find out the effect of Leadership Commitment on organizational performance of NGOs.
ii. To examine the effect of resource allocation on the organizational performance of NGOs;

II. LITERATURE REVIEW

2.1 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, introduced by Wernerfelt.,(1984) and further developed by Barney (1991), posits that an organization's performance is fundamentally determined by its ability to effectively manage and leverage its internal resources. According to this theoretical framework, organizations that possess resources characterized as valuable, rare, inimitable, and well-organized (as per the VRIO framework) are more likely to achieve a sustainable competitive advantage and superior performance (Gerhart, 2021). Unlike externally focused strategic models that emphasize market conditions or competitive dynamics, RBV centers on internal capabilities, asserting that long-term success stems from the efficient management and strategic utilization of available resources (Mailani et al., 2024).

For non-governmental organizations (NGOs), the strategic utilization of financial resources, human capital, and institutional knowledge is critical to enhancing service delivery and ensuring long-term sustainability (Kibet & Kibati, 2024). Strategic solutions serves as a vital mechanism for optimizing the use of these resources, with three key components leadership commitment, resource allocation, and stakeholder engagement playing a pivotal role in influencing organizational performance (Kabeyi, 2019). The RBV theory underscores that an organization's success hinges on its capacity to manage, allocate, and leverage its internal resources effectively. Leadership commitment refers to the dedication and active involvement of top management in guiding the organization toward its strategic objectives.

Effective leadership ensures that resources are aligned with the organization's mission and vision, fostering a culture of accountability, innovation, and resilience (Barney, 1991). Within the RBV framework, leadership commitment enhances an NGO's ability to mobilize and optimize its resources, ensuring their effective utilization for mission-driven activities. When leaders demonstrate strong commitment, they inspire confidence among stakeholders, improve decision-making processes, and create an environment conducive to achieving long-term sustainability and performance (Henry et al., 2023).

Leadership commitment also plays a critical role in risk planning, as committed leaders are more likely to anticipate potential challenges, allocate resources strategically, and implement proactive measures to mitigate risks (Kabeyi, 2019) . By safeguarding valuable resources and maintaining operational stability, leadership commitment aligns with RBV's assertion that well-managed internal capabilities are essential for achieving superior organizational outcomes.

Ho_1: Leadership commitment has a significant effect on the organizational performance of NGOs in the Morogoro Region.

The RBV theory suggests that organizations with superior internal capabilities, such as leadership commitment, are better equipped to protect their valuable resources, maintain operational stability, and achieve sustained competitive advantage (Barney, 1991). Leadership commitment is a critical internal capability that drives Strategic solutions, resource optimization, and risk mitigation. Committed leaders ensure that resources are aligned with the organization's mission, foster a culture of accountability and innovation, and proactively address challenges to safeguard the organization's assets (Kabeyi, 2019; Henry et al., 2023).

Within the RBV framework, leadership commitment enhances an NGO's ability to mobilize and leverage its resources effectively, ensuring their availability for mission-critical activities.

When leaders demonstrate strong commitment, they inspire confidence among stakeholders, improve decision-making processes, and create an environment conducive to achieving long-term sustainability and performance (Mailani et al., 2024). Leadership commitment also plays a pivotal role in risk planning, as committed leaders are more likely to anticipate potential threats, allocate resources strategically, and implement proactive measures to mitigate risks.

If the hypothesis that leadership commitment significantly contributes to NGO performance is rejected, it would challenge RBV's assertion that well-managed resources, underpinned by strong leadership, are essential for achieving superior organizational outcomes. Conversely, confirming this hypothesis would provide robust evidence for RBV's argument, demonstrating that leadership commitment is a critical internal capability that enables NGOs to optimize their

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resources, mitigate risks, and sustain high performance. Thus, this hypothesis underscores the importance of leadership commitment as a key driver of organizational performance, aligning with RBV's emphasis on the strategic management of internal Resources.

Resource allocation refers to how NGOs distribute financial, human, and material resources to different activities and projects (Kithinji et al., n.d.). According to RBV, efficiently allocating resources to high-priority activities maximizes their value and contributes to superior organizational performance (Boadi-sarpong et al., 2023). NGOs with well-structured allocation mechanisms can ensure that limited resources are directed toward impactful initiatives, reducing waste and improving efficiency (Gul & Morande, 2023).

Ho_2: Resource allocation has significant effect on the organizational performance of NGOs in the Morogoro Region.

From an RBV perspective, organizations that strategically allocate resources to high-impact activities gain a competitive advantage by enhancing their operational effectiveness. If resource allocation is found to significantly influence NGO performance, rejecting this hypothesis would further validate RBV's emphasis on resource optimization as a key driver of success.

2.2 Empirical Review

Empirical research consistently underscores the pivotal role of leadership commitment as a cornerstone of organizational performance, particularly for NGOs operating in complex, resource-constrained environments. The interplay of leadership styles and their commitment is a critical area of inquiry. A study in Korea by Kim & Oh.(2023) demonstrated that a synergistic combination of transformational and transactional leadership yields the strongest correlation with organizational commitment, though transformational leadership shows marginally more favorable outcomes. This aligns with findings from Tanzania, where Kasanga and Mokaya.,(2017) identified strong positive correlations between the core components of transformational leadership idealized influence, inspirational motivation, individualized consideration, and intellectual stimulation and enhanced performance at Compassion International Tanzania. Similarly, research in Kenya by Orwa and Odollo,.(2023) provides direct evidence that leadership commitment significantly and positively influences NGO performance.

The mechanisms through which leadership exerts its influence are further elucidated in qualitative studies. Hayat (2024) emphasizes that effective leadership drives innovation and change by fostering trust, shaping organizational culture, and ensuring strategic clarity. This is corroborated by Manley (2024), whose phenomenological study of INGO leaders identified a leader's collaborative posture and practice as fundamental to building trust and shared ownership, which are essential for transformative change. However, the Tanzanian context reveals that leadership challenges persist. The study by Mtunge and Mokaya (2016) in Arumeru District confirmed significant correlations between leadership vision, communication, and commitment with project implementation success, yet noted a high rate of incomplete projects, suggesting that commitment alone may be insufficient without adequate supportive structures.

Concurrently, the strategic allocation of resources emerges as an equally critical determinant of organizational sustainability and performance. The efficient orchestration of resources is a universal challenge. Allu et al. (2024) highlight that poor data availability and suboptimal allocation strategies lead to significant resource underutilization across projects, advocating for centralized systems to improve efficiency. This perspective is reinforced by the Resource-Based View, which suggests that the strategic management of internal capabilities is key to performance. However, the NGO context presents unique resource challenges. In Uganda, Henry et al. (2023) found that diversified donor bases and strategic partnerships significantly enhance the sustainability of Community-Based Organizations, while in Tanzania, Onesmo and Mushi (2022) identified a critical need for capacity building in resource development and management within rural NGOs.

The nexus between leadership and resource management is particularly crucial. Studies indicate that management competency is an essential for effective resource utilization. The study by Kaputa & Simon.(2024) found that poor management competence and a lack of accountability directly negatively impacted project success in a Zambian NGO. Similarly, Ezekiel. (2024) identified management competency in resource mobilization and grant writing as a primary determinant of financial sustainability for local NGOs in Arusha, Tanzania, though a concerning number lacked clear strategies. This underscores that leadership commitment must extend to the smart stewardship of resources. As Nyambaka and Sagini (2024)found in Kenya, strategic management practices like effective crisis management and internal resource analysis significantly improve NGO performance, yet many organizations lack these formalized processes.

In synthesis, the empirical literature confirms that leadership commitment and strategic resource allocation are inseparably linked drivers of NGO performance. Committed leadership provides the strategic vision and fosters the organizational culture necessary for success, while effective resource allocation ensures that the tangible and intangible assets required to execute that vision are optimally deployed. The findings from various contexts, including Tanzania, point to a critical gap: the need for NGO leaders to not only be committed and inspirational but also possess the strategic

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acumen to build robust resource systems, diversify funding, and implement stringent financial controls to navigate the precarious operational landscapes they inhabit.

2.3 Research Gaps and Contributions

Although earlier works have highlighted the importance of leadership (Haule, 2024; Manley, 2024; Orwa & Odollo, 2023) and resource leveraging (Allu et al., 2024; Grant, 1991; Henry et al., 2023; Mailani et al., 2024) to NGO performance, these studies are often contextually limited, theoretically deficient, or analytically narrow. Few studies use a merged theoretical perspective that incorporates both Stakeholder Theory and Resource-Based View (RBV) (Grant, 1991; Henry et al., 2023). Even fewer have focused specifically on Tanzanian NGOs, where the problems of donor dependence, below-standard internal governance, and resource insufficiency are particularly acute (Grant, 1991; Mailani et al., 2024). Further, current literature tends to treat leadership and resource allocation as separate constructs. There exists a gap in academic research that articulates the intertwined dynamics between leadership commitment and strategic allocation of resources, and how these dynamics influence overall performance outcomes. Just as NaCoNGO (2023) and Ezekiel (2024) have indicated, a lack of intertwined strategy perpetually compromises organizational resilience as well as sectoral credibility.

III. METHODOLOGY

3.1 Study Design

This study used a sequential explanatory mixed-methods design, combining both quantitative and qualitative approaches to explore the relationships between leadership commitment, resource allocation, and NGO performance. The quantitative component aimed to identify statistical connections, while the qualitative component provided contextual insights to clarify and expand on these findings. This approach was selected to enhance the depth and validity of the results through methodological triangulation.

3.2 Study Area

The study was carried out in Morogoro Region, Tanzania, focusing on NGOs registered and operating across seven districts. These NGOs represented various sectors such as health, education, economic empowerment, and environmental conservation. Including NGOs from both urban and rural areas provided a more comprehensive understanding of organizational performance in different settings.

3.3 Study Population

The target population included 473 NGO managers listed in national and regional databases. These managers were considered appropriate respondents because of their active involvement in strategic planning, resource management, and organizational decision-making. Regarding the qualitative part, the study focused on senior NGO leaders with experience in governance, donor engagement, and operational management.

3.4 Sample Size and Sampling Procedure

The sample size for the quantitative part of the study was calculated using Yamane.,(1967) formula for finite populations to ensure accuracy and representativeness(Adam, 2020; Ajay & Micah, 2014). The estimated population of registered NGOs in the Morogoro region was 473. Using Yamane's formula at a 95% confidence level with a 5% margin of error, the minimum sample size was determined as:

$$n = \frac{N}{1+N(e)^2}$$

$$n = \frac{473}{1 + 473(0.05)^2}$$

$$n = \frac{473}{2.1825}$$

$$n = 217$$

Where:

n = sample size;
N = population size (473)
e = margin of error (0.05)

A total of 217 NGO managers participated in the survey. NGOs were first categorized by size and sector, then respondents were chosen using systematic random interval sampling to ensure representativeness. For the qualitative

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part, saturation was achieved after purposively selecting 15 senior NGO leaders based on their strategic roles and decision-making authority. This approach allowed for a more in-depth examination of leadership practices, resource utilization, and contextual performance factors.

3.5 Data Collection

Quantitative data was collected through a structured questionnaire addressing key areas such as leadership commitment, resource allocation efficiency, and organizational performance. The questionnaire was pre-tested for clarity and relevance before being distributed either electronically or in person, based on regional accessibility. Qualitative insights were obtained from semi-structured interviews with managers, focusing on NGO internal dynamics, decision-making, and resource management. Moreover, organizational documents like strategic plans and audit reports were reviewed to corroborate the responses.

3.6 Data Analysis

Quantitative data analysis was conducted using SPSS, with multiple regression assessing the proposed relationships between leadership commitment, resource allocation, and performance. Construct validity was supported by the VRIO framework, while internal consistency was confirmed by a high Cronbach's alpha ($\alpha = 0.964$), exceeding recommended threshold of 0.7. Qualitative interviews were transcribed verbatim and analyzed thematically in NVivo, employing an inductive coding approach that allowed patterns to emerge naturally. These themes were then compared with the quantitative results through joint display tables for a comprehensive interpretation. Triangulation, which integrated survey results, interviews, and documents, enhanced the validity and reliability of the findings.

3.7 Ethical Considerations

Ethical approval was obtained from the Mzumbe University Directorate of Research and Postgraduate Studies (DRPS) and the regional registrar of NGOs in the Morogoro region. All participants provided informed consent, including clear details about the study's purpose, voluntary participation, and the right to withdraw at any time. Data were anonymized and stored securely. Additionally, validation workshops were held with participating NGOs to confirm the accuracy of interpretations and foster transparency.

IV. FINDINGS & DISCUSSIONS

4.1 Response Rate

Out of 217 questionnaires sent to NGO managers in Tanzania, 203 were returned, yielding a 93.5% response rate, which meets the threshold (Salum et al., 2017). This high participation, common in development and NGO surveys, was likely due to effective follow-up, collaboration with NGO networks, and the perceived importance of the study. This participation enhances data validity, reduces bias, and supports the generalizability of findings.

Table 1

Response Rate

Description	Quantity	Percentage (%)
Questionnaires distributed	217	100
Questionnaires returned	203	93.5
Questionnaires not returned	14	6.5

4.2 Descriptive Analysis

This section provides a descriptive overview of the study's three main variables, including leadership commitment, resource allocation, and organizational performance, supported by both quantitative data and qualitative insights. The variables were assessed using a 5-point Likert scale, and the findings are analyzed within the framework of theory and relevant empirical research.

4.2.1 Leadership Commitment

Table 2 provides a summary of the key variables related to leadership commitment. This table outlines the selected items examined in the study.

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Table 2

Summary of the Variables based on Leadership Commitment

S/N	Items	Mean (M)	SD	Remarks
1	Leaders allocate sufficient resources (budget, staff, time)	4.07	0.95	High
2	Leadership communicates the strategic plan clearly to all employees	4.00	0.90	High
3	Leaders regularly review progress against strategic objectives	4.10	0.88	High
4	Senior leadership actively champions the organization's strategic goals	4.37	0.74	Very High
5	Strategic plan performance metrics are discussed in leadership meetings	3.99	0.82	High
6	Leadership adjusts strategies based on performance reviews	3.98	0.92	High
7	Leaders actively participate in key strategic decisions	4.35	0.78	Very High
8	Leadership seeks input from employees before finalizing decisions	3.98	0.96	High
9	Leaders demonstrate accountability for strategic plan outcomes	4.07	0.93	High
	Grand Mean	**4.10**	**0.88**	**High**

The study found a generally strong level of engagement and accountability among organizational leaders, with a grand mean of 4.10 (SD = 0.88). The highest-rated practices were senior leadership's active championing of strategic goals (M = 4.37, SD = 0.74) and their participation in key strategic decisions (M = 4.35, SD = 0.78). These findings indicate that leadership is essential in driving the organization's vision and shaping its strategy. This aligns with the Resource-Based View (RBV), which posits leadership as a valuable, rare, and inimitable internal resource that is critical for sustaining a competitive advantage (Barney et al., 2021; Wright et al., 1994).

Qualitative data offered further insights. One respondent noted:

> *"In our organization, leadership goes beyond signing documents or issuing directives. Our leaders actively engage with staff through monthly reflection meetings where we discuss goals, challenges, and progress. This regular interaction fosters a shared sense of purpose, improves coordination, and builds trust across teams."*

This reflects the transformational leadership approach that boosts internal cohesion, trust, and performance. This finding is supported by studies from Orwa and Odollo (2023) and Henry et al., (2023), who identified participatory leadership as a key factor driving performance in East African NGOs. However, not all leadership practices were seen as enabling. Another respondent stated:

> *"Our leader is highly dedicated and passionate about the mission, which we value. However, in practice, every decision, even small operational approvals, must go through her. This centralization causes delays and bottlenecks, especially when quick action is needed at the field level. It can also sometimes limit staff autonomy and reduce overall responsiveness"*

This observation highlights the potential pitfalls of overly centralized decision-making, a challenge also reported by Temba (2020) and Ezekiel (2024), who noted that hierarchical leadership structures often hinder timely decision-making and innovation in NGOs.

4.2.2 Resource Allocation

Table 3 presents a summary of the key variables associated with resource allocation. This table details the various variables measured in relation to how resources are allocated within the organization

Table 3

Summary of the Variables based on Resource Allocation

S/N	Variables	Mean (M)	SD	Remarks
1	Our budget allocations directly support strategic priorities	4.16	0.93	High
2	Leadership conducts quarterly reviews of budget utilization	4.12	1.01	High
3	Real-time budget tracking systems are fully operational	3.85	1.08	Moderate
4	Monthly efficiency assessments of all resources	3.75	1.00	Moderate
5	Resources are reallocated within 30 days of identifying inefficiencies	3.49	0.91	Moderate to Low
6	Quarterly performance metrics (ROI, cost-benefit) inform decision-making	3.93	0.76	Moderate to High
7	Maintain ≥3 distinct funding sources (grants/donations/earned income)	3.78	1.02	Moderate
8	Dedicated staff/team actively secures new funding quarterly	3.83	1.05	Moderate
9	Documented 3-year strategy to diversify funding exists	3.79	1.11	Moderate
	Grand Mean	**3.86**	**0.98**	**Moderate overall**

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The analysis presents a mixed view of resource allocation, with a moderately positive overall rating (M = 3.86, SD = 0.98) reflecting strong strategic oversight in budget alignment and quarterly reviews, but revealing critical operational gaps in real-time tracking, efficiency assessments, and agile resource reallocation. Furthermore, mid-range scores in funding sustainability highlight a vulnerability in long-term financial resilience, a challenge consistent with findings from other Tanzanian studies on donor-dependent organizations (Ezekiel, 2024; Kaputa & Simon, 2024). The significant response variability also suggests inconsistent implementation across departments. Ultimately, strengthening systems for timely reallocation, real-time tracking, and diversifying funding streams is paramount for enhancing the organization's overall agility and sustainability

Qualitative insights corroborated these findings. One finance manager observed:

> *"Most of our grants are tied to pre-defined budgets and line items set by donors. Even when local needs evolve or community priorities shift mid-project, we have little to no flexibility to reallocate funds without seeking formal approval. This rigidity often prevents us from responding effectively to real-time challenges on the ground."*

This rigidity limits adaptive planning and responsiveness, as highlighted in the works of Moshtari et al. (2024) and Mawdsley (2012), who emphasize that donor-imposed constraints can restrict NGOs' operational flexibility. Another respondent added:

> *"We do our best with the limited resources available, trying to meet our targets and serve the communities. But when it comes to financial sustainability, being able to operate independently and consistently over time, that's the real challenge. It's the elephant in the room that no one wants to talk about, yet it affects everything we do."*

This echoes earlier findings by NaCoNGO. (2023), which identified overreliance on donor funds and weak local fundraising capacity as persistent risks to NGO viability. These insights reinforce the RBV's emphasis on strategic resource deployment, while also underscoring the need to build internal resilience to external funding fluctuations (Grant, 1996; Teece et al., 2009).

4.2.3 Organizational Performance

Table 4 provides a summary of the variables related to organizational performance. This table highlights the selected items assessed to evaluate how organizational performance is measured and understood within the context of the study.

Table 4

Summary of the Variables based on Organizational Performance

S/N	Item	Mean (M)	SD	Remarks
1	Employee satisfaction surveys are conducted at least annually	3.70	1.196	Moderate
2	Employee feedback leads to measurable improvements in work conditions	3.92	0.992	High
3	Transparent and timely system for addressing employee grievances	3.95	1.050	High
4	Organization proactively monitors and controls operational costs	4.24	0.796	High
5	Budget adjustments are made promptly when cost overruns occur	4.19	0.897	High
6	Regular audits identify opportunities for cost efficiency	4.37	0.945	High
7	Staff and financial resource usage is tracked in real-time	4.15	0.899	High
8	Resources are reallocated within 30 days to support high-priority needs	3.92	0.903	High
9	Performance metrics (e.g., ROI) are used to evaluate resource effectiveness	4.08	0.853	High
10	All employees have clear, measurable productivity targets	4.17	0.885	High
11	Employees receive necessary tools/resources to meet productivity goals	4.18	0.885	High
12	Productivity reviews are conducted quarterly with actionable feedback	4.14	0.750	High
13	Service quality for beneficiaries is monitored using standardized metrics	4.02	0.898	High
14	Beneficiary feedback directly informs service delivery improvements	4.15	0.937	High
15	Staff undergo bi-annual training to enhance service delivery skills	3.65	1.222	Moderate
	Grand Mean	4.06	0.94	High

The analysis reveals a high overall level of organizational performance (M = 4.06, SD = 0.94), with the strongest aspects being financial oversight and operational efficiency, such as regular audits for cost efficiency (M = 4.37) and cost monitoring and control (M = 4.24). This suggests that, on average, the organization perceives itself as effective in meeting core operational and financial objectives. This finding is consistent with Kabeyi.(2019) and Henry et al..(2023), who observed that despite structural challenges, many East African NGOs continue to deliver valuable services. However, the moderately lower scores for employee-focused activities like annual satisfaction surveys (M = 3.70) and staff training (M = 3.65) compared to financial metrics suggest that internal constraints in human resource development may be dampening overall performance outcomes. One program coordinator noted:

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> *"Yes, we do meet our targets—but many of those targets are donor-driven and don't always reflect the actual needs and priorities of the communities we serve. There's often a disconnect between what's funded and what's truly relevant on the ground, which limits the long-term impact of our interventions."*

This reflects the ongoing debate around performance measurement in NGOs, where achieving donor-defined metrics does not always equate to community impact (Banks et al., 2015; C. Batti., 2014). Another interviewee observed:

> *"Sometimes, our performance reports look strong on paper—indicators are marked as achieved, and outputs appear satisfactory. But the reality on the ground can be very different. Projects often struggle due to delayed disbursement of funds or chronic understaffing, which hampers timely implementation and reduces actual impact."*

This highlights a discrepancy between reported and actual performance, influenced by contextual constraints such as funding instability and bureaucratic delays an issue also discussed by Lewis.(2003) and Naidoo.(2011). Therefore, these findings reinforce the integrated role of leadership and resource management in shaping performance. Strong internal systems enhance the likelihood of meeting targets, but broader sustainability remains vulnerable to environmental factors.

4.3 Inferential Analysis

4.3.1 Leadership Commitment

Table 5 presents the results of the inferential analysis examining the impact of leadership commitment on the organizational performance of NGOs.

Table 5

Leadership Commitment on the Organizational Performance of NGOs

Variables	N	df	r.cal	p.val	Decision
Leadership	217				
Organizational Performance	217	436	.668	0.0009	Accepted

p>0.05

The quantitative analysis revealed a moderately strong, statistically significant positive relationship between leadership commitment and organizational performance ($r = 0.668$, $p = 0.0009$). This foundational finding was further elucidated by the multiple regression, which showed leadership commitment as a significant predictor ($\beta = 0.333$, $p = 0.000$). This quantitatively affirms that leadership is not merely a supportive function but a direct driver of performance.

The qualitative data brings this correlation to life, revealing three key mechanisms through which committed leadership operates. First, the involvement of leaders in structured strategic planning reported by 80% of the organizations emerged as critical. This finding directly aligns with (Allu et al., 2024), who identified a strategic management skills gap as a primary weakness in Tanzanian NGOs. The present study demonstrates that closing this gap through active leadership engagement has tangible benefits. As one CEO illustrated, shifting from "executive orders to co-created strategies" dramatically increased program compliance from 60% to 85%. This supports participatory governance models advocated by Temba. (2020), showing that leadership which facilitates, rather than dictates, unlocks higher performance.

Second, leadership's role in strategic resource reallocation was highlighted. The finding that 65% of leaders actively pivot budgets to align with priorities addresses the issue of resource mismanagement identified by (Kaputa & Simon, 2024). It suggests that effective leadership is a key variable separating organizations that suffer from mismanagement from those that practice strategic optimization. A Program Manager's statement that reallocation "required leadership to champion the pivot at the board level" underscores that financial flexibility is as much a governance and leadership issue as it is a technical one.

Third, the operational engagement of executives in solving bureaucratic bottlenecks was a key differentiator. The regression coefficient ($\beta = 0.333$) quantifies the importance of this hands-on involvement. The qualitative finding that 70% of NGOs see improved outcomes when leaders are operationally engaged provides a practical explanation for this statistic. It diverges from a purely top-down, visionary model of leadership, suggesting that in the challenging context of Tanzanian civil society, performance is also driven by leaders who are directly involved in clearing operational path blocks, a phenomenon vividly captured by the concept of protected "strategy hours."

These quantitative findings complement qualitative insights from NGO managers who emphasized how leadership engagement "turns vision into impact," echoing (Manley, 2024) observations about collaborative leadership in international NGOs. Transformative impact of this involvement was captured by an Education NGO CEO who observed that:

> *"Our transition from top-down directives to collaborative strategy development boosted program compliance rates from 60% to 85%."*

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This finding indicates that participatory leadership approaches produce significantly better outcomes than traditional hierarchical models. Additionally, the study emphasizes the importance of leadership in resource coordination. In 65% of high-performing NGOs, management teams actively participated in budget realignment to prioritize strategic goals. A Program Manager's account illustrated this:

> *"Securing funding reallocation for youth training required persistent leadership advocacy at the board level - it transcended mere financial considerations."*

This emphasizes how effective leaders act as champions for resource optimization. Third, operational engagement proved to be a key differentiator. Seventy per cent of respondents reported that executive involvement in daily operations helped overcome bureaucratic barriers. A Health NGO Planning Officer's comment encapsulated this finding:

> *"Without leadership protecting dedicated 'strategy hours', routine firefighting consumes all organizational capacity."*

This suggests that hands-on leadership can significantly improve operational efficiency among NGOs in Morogoro region.

4.3.2 Resource Allocation

Table 6 displays the results of the inferential analysis exploring the effect of resource allocation on the organizational performance of NGOs.

Table 6

Resource Allocation on the Organizational Performance of NGOs

Variables	N	df	r.cal	p.val	Decision
Resources	217				
Organizational Performance	217	436	.704	0.0000	Accepted

p>0.05

The analysis identified resource allocation as the single strongest predictor of organizational performance in the regression model ($\beta = 0.427$, $p = 0.000$), with a very strong positive correlation ($r = 0.704$). This confirms the proposition of Henry et al.,(2023) that resource constraints are a major barrier to goal achievement. However, this study moves beyond merely noting the constraint to explicating its dynamics. The strong positive relationship indicates that performance is tightly linked to practices of budget utilization, funding sustainability, and resource optimization. This finding converges with national data from (NaCoNGO, 2023), which links financial mismanagement to organizational failure. However, the qualitative data reveals the complex challenges behind the numbers: a significant 60% of NGOs face donor-imposed restrictions that stifle this optimization. The compelled abandonment of a livelihoods program for a donor-preferred maternal health initiative is a classic example of how external dependency can undermine contextual relevance and, ultimately, performance.

Furthermore, the consequences of poor allocation are severe, with 45% of NGOs reporting they had to scale back programs due to funding gaps. The resulting reliance on community volunteers, while a cost-effective strategy, introduces new risks like burnout, highlighting a difficult trade-off between financial sustainability and human resource well-being. Notably, a point of divergence from a purely resource-dependent narrative is the finding that 30% of organizations had rejected funding due to mission misalignment. This suggests that a certain level of strategic maturity and leadership fortitude exists within the sector, where performance is defined not just by activity levels but by adherence to core mission, even at a financial cost (Ezekiel.,(2024). However, qualitative data revealed significant challenges in resource optimization. 65% of organizations reported constraints imposed by donor restrictions, with one manager lamenting,

> *"We had to halt a successful livelihoods program when funding was solely linked to maternal health initiatives"*

This underscores the tension between donor priorities and local needs. Additionally, funding instability has become a significant challenge, with 45% of NGOs needing to scale back programs due to financial shortages. As one respondent noted,

> *"After losing a major grant, we depended heavily on volunteers to keep operations going. Although this was cost-effective at first, it eventually caused staff exhaustion, lowered morale, and a noticeable decline in service quality."*

4.3.3 Organization Performance

The multiple regression model, which explains 55.8% of the variance in organizational performance ($R^2 = 0.558$, F-statistic = 90.489, $p < 0.005$), provides powerful evidence for an integrated approach to understanding NGO

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performance. The individual contributions of resource allocation (β = 0.427) and leadership commitment (β = 0.333) demonstrate that these are not isolated factors but interconnected pillars. The findings suggest a synergistic relationship: strong leadership is a prerequisite for effective resource allocation, and adequate resources enable leadership strategies to be implemented. An executive can champion a strategic pivot (leadership), but success depends on their ability to reallocate funds (resource allocation). Conversely, a perfectly crafted budget is useless without the leadership to defend it and navigate its implementation. This directly addresses the research gap identified in the problem statement, demonstrating how the "triad" of challenges here, focusing on leadership and resources, manifests and interacts not in isolation, but in a tightly coupled system.

Table 7

Effects of Leadership Commitment and Resource Allocation on NGOs Performance

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	R	R^2	F
		B	Std. Error	Beta					
1	(Constant)	.812	.203		4.001	.000			
	Leadership	.332	.064	.333	5.185	.000			
	Resources	.428	.072	.427	5.964	.000	.747	.558	90.489

This analysis emphasizes that both resource allocation and leadership commitment are crucial factors in NGO performance, with resource management being the slightly more influential predictor. To improve organizational results, NGOs should focus on leadership development programs and establish effective resource management systems to ensure efficient use of financial, human, and material assets. Future studies could investigate additional factors, such as stakeholder engagement or external funding dynamics, to further refine predictive models of NGO effectiveness. One Finance and Administrative Manager commented that:

> *"We track milestones, but real success shows when communities own the outcomes, like when mothers' groups sustain health programs after our exit. That's why researchers share progress dashboards with staff and gather stakeholders quarterly to discuss what's working or needs to change. "*

The study offers important theoretical insights by demonstrating how both the Resource-Based View (RBV) theory apply to NGO management. The findings show that strong leadership acts as a key organizational resource that meets all VRIO criteria, supporting but qualifying Mailani et al., (2024) application of RBV to non-profit contexts by demonstrating how intangible assets like leadership culture can create competitive advantages even in resource-constrained environments. Moreover, while the study largely confirmed theoretical expectations, two unexpected findings emerged that contribute to ongoing scholarly debates. Firstly, the weaker than anticipated relationship between resource allocation and performance challenges conventional NGO management wisdom that prioritizes community engagement, adding nuance to (Donaldson & Preston, 1995) critiques by suggesting that in Tanzanian contexts, internal capabilities may outweigh external relationships in driving effectiveness. Second, the high variability in sustainable funding perceptions (SD = 1.06) reveals deeper systemic issues that extend Onesmo and Mushi (2022) work on rural Tanzanian NGOs by quantifying the financial instability challenges they described qualitatively.

The study answers its hypotheses while advancing scholarly understanding in several ways. Regarding how leadership commitment affects performance, the results demonstrate that engaged leadership enhances strategic coherence, resource alignment, and operational efficiency, building on but providing more granular evidence than Kasanga and Mokaya (2017) transformational leadership study in Tanzania. Concerning resource allocation approaches, the findings show that budget discipline, optimization techniques, and mission-aligned funding strategies prove most effective, offering empirical validation to Nyambaka and Sagini (2024) strategic management recommendations while adding new quantitative evidence from the Tanzanian context. These contributions collectively advance both theoretical and practical understanding of NGO management in developing economies.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study investigated how strategic management affects NGO performance in Morogoro, Tanzania. Key insights show that leadership commitment is essential, as mission-driven leaders improve performance and better coordinate operations. Resource allocation is identified as the most important factor; effective practices help maximize limited resources while maintaining quality. Additionally, a hierarchy of priorities develops as leadership creates the foundation, and resource allocation helps turn the vision into action. These findings offer an evidence-based, practical model for Tanzanian NGOs facing leadership challenges and reliance on donors. However, the results strongly support the argument that breaking the cycle of NGO underperformance in Tanzania requires a fundamental rethinking of

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management paradigms. It is not a choice between strengthening leadership or improving resource management; the evidence indicates that both must be addressed simultaneously and in an integrated manner. Effective leadership acts as the catalyst that transforms allocated resources into tangible performance outcomes, creating an organizational environment where strategic planning, financial agility, and mission fidelity drive sustainable success.

5.2 Recommendation

The findings underline the importance of creating policies specifically for Tanzania. The researcher recommends making certification mandatory for NGO leaders and offering tax incentives to promote local fundraising. These steps are crucial as Tanzania reforms its NGO sector and seeks to cut reliance on foreign funding. Based on solid evidence and the local context, this study offers valuable insights into NGO management, providing practical solutions to sustainability challenges. It highlights the significance of leadership commitment and resource strategies in enhancing NGO performance, focusing on two main goals: firstly, understanding how leadership influences performance, and secondly, evaluating the effectiveness of resource allocation in environments heavily reliant on donors with limited funds.

REFERENCES

Adam, A. M. (2020). Sample Size Determination in Survey Research Sample Size Determination in Survey Research. *Journal of Scientific Research and Reports, 26* (5),90-97.https://doi.org/10.9734/JSRR/2020/v26i530263

Ajay, S., & Micah, B. (2014). Sampling techniques & determination of sample size in applied statistics Research: An overview. *International Journal of Economics, Commerce and Management United Kingdom Http://Ijecm.Co.Uk/*, *II*(11), 1–22.

Allu, S. R., Bhaumik, A., Ramakrishna, A., Lakavat, M., & Allu, H. (2024). A Critical Review of Resource Allocation Optimization in Project Management. *International Research Journal on Advanced Engineering Hub (IRJAEH)*, *2584-2137*, *02*(June), 1855–1861.

Banks, N., Hulme, D., & Edwards, M. (2015). NGOs, States, and Donors Revisited: Still Too Close for Comfort? *World Development*, *66*, 707–718. https://doi.org/10.1016/j.worlddev.2014.09.028

Barney, J. (1991). Firm Reources ad Sustained Competitive Advantege. In *Journal of Management* (Vol. 17, Issue 1, pp. 99–120).

Barney, J. B., Ketchen, D. J., & Wright, M. (2021). Resource-Based Theory and the Value Creation Framework. *Journal of Management*, *47*(7), 1936–1955. https://doi.org/10.1177/01492063211021655

Basilio, O. (2016). Case study 3: R&D and innovation Orgaization within KIBS. *Nonprofit Management & Leadership*, *20*(2), 219–233. https://doi.org/10.1002/nml

Bloodgood, E. A., & Schmitz, H. P. (2024). The INGO Research Agenda: Changes in approach and outcomes over the last decade. *Routledge Handbook of International Organization: Second Edition*, 83–95. https://doi.org/10.4324/9781003428138-7

Boadi-sarpong, A. B., Agyei, P. A., Mensah, E., & Boateng, P. A. (2023). Resource Allocation Strategies for Maintaining Competitiveness and Achieving Innovation Success. *International Journal of Research and Scientific Innovation (IJRSI)*, 188–197. https://doi.org/10.51244/IJRSI

C. Batti, R. (2014). Challenges Facing Local NGOs in Resource Mobilization. *Humanities and Social Sciences*, *2*(3), 57–64. https://doi.org/10.11648/j.hss.20140203.12

Donaldson, T., & Preston, L. E. E. E. (1995). The Stakeholder Theory of the Corporation : Concepts , Evidence , and Implications Author (s): Thomas Donaldson and Lee E . Preston Source : The Academy of Management Review , *20*(1), 65–91.

Ezekiel, K. (2024). Determinants of Financial Sustainability for Local Non-Governmental Organisations in Arusha, Tanzania. *NG Journal of Social Development, 2814-1105), 30–45. Https://Www.Ajol.Info/Index.Php/Ngjsd DOI:Https://Dx.Doi.Org/10.4314/Ngjsd.V15i1.3*

Gerhart, B. (2021). The Resource-Based View of the Firm , Human Resources , and Human Capital : Progress and Prospects. *Journal of Management*, *47*(7), 1796–1819. https://doi.org/10.1177/0149206320978799

Grant, R. M. (1991). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, *33*(3), 114–135. https://doi.org/10.2307/41166664

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, *17*(SUPPL. WINTER), 109–122. https://doi.org/10.1002/smj.4250171110

Gul, K., & Morande, S. (2023). Factors Influencing Sustainability of Non-Governmental Organizations in the developing world. *Seisense Business Review, 3 No 1 (20*(1), 1–21.

Haule, A. (2024). Effects of Strategic Leadership Practices on Public Organization ' s Performance in Tanzania : A Case Study of Kigamboni Municipal Council. *African Journal of Empirical Research*, *5*(2019), 1593–1603.

Licensed Under Creative Commons Attribution (CC BY-NC)

https://doi.org/https://doi.org/10.56279/orseaj.v13i1.4

Hayat, Z. (2024). Catalysing Change : The Power of Effective Leadership in Driving Innovation. *Educational Administration: Theory and Practice*, *30(5)*(5), 3789–3793. https://doi.org/10.53555/kuey.v30i5.3534

Henry, A., Vincent, O., Gladies, A., & Vincent, B. (2023). Resource Mobilization Strategies, Resource Utilization and Sustainability of Community Based Organizations in Developing Countries: Emerging studies of CBOs in Arua District, Uganda. *Orsea Journal*, *13*(1), 2023.

Kabeyi, M. J. B. (2019). Organizational strategic planning, implementation and evaluation with analysis of challenges and benefits for profit and nonprofit organizations. *International Journal of Applied Research*, *5*(6), 27–32. https://doi.org/10.22271/allresearch.2019.v5.i6a.5870

Kaputa, E., & Simon, T. (2024). Factors Affecting the Success of Project Implementation : The Case of One Factors Affecting the Success of Project Implementation : The Case of One Non-Governmental Organisation in Zambia. *Journal of Experience Research*, *April*. https://doi.org/10.5923/j.jer.20240101.01

Kasanga, M. J., & Mokaya, S. O. (2017). Effects of Transformational Leadership on Organizational Performance in Non-Governmental Organizations ; Case Study of Compassion International Tanzania. *International Journal of Science and Research (IJSR)*, *6*(10), 792–796. https://doi.org/10.21275/2101702

Kessy, A. T. (2025). A critical review of the current major challenges of nonprofit organizations in Tanzania. *Conflict Management in Nonprofits*, *1*(April), 155–172. https://doi.org/10.1515/9783111252018-009

Kibet, S. T., & Kibati, P. (2024). Influence of Financing decision on operational sustainability of NGOS in Nakuru County,Kenya.Vol. 7, Issue 2, pp: (603-614), Month: April - June 2019. *International Journal of Social Science and Humanities Research.*, *7*(2), 603-614.

Kim, T., & Oh, M. (2023). Unveiling the Impact of Leadership Interplay on Organizational Commitment. *Journal of Policy Studies*, *38*(4), 9–21. https://doi.org/https://doi.org/10.52372/jps38402

Kithinji, C., Gakuu, P. C., & Kidombo, P. H. (n.d.). Resource Allocation , Evaluational Capacity Building M & E Results Utilization Among Community Based Organizations in Meru County in Kenya. *European Scientific Journal*, *13*(16), 283–304. https://doi.org/10.19044/esj.2017.v13n16p283

Kwao, B., & Amoak, D. (2022). Does size really matter? The prevalence of NGOs and challenges to development in Northern Ghana. *Norwegian Journal of Geography*, *76*(3), 149–163. https://doi.org/10.1080/00291951.2022.2072383

Lewis, D. E. (2003). Management and leadership performance in the defense department: Evidence from surveys of federal employees. *Armed Forces and Society*, *34*(4), 639–661. https://doi.org/10.1177/0095327X07301255

Li, H., & Farid, M. (2023). Stay or exit: How do international nongovernmental organizations respond to institutional pressures under authoritarianism? *Regulation and Governance*, *17*(2), 512–530. https://doi.org/10.1111/rego.12473

Mailani, D., Zhandra, M., Hulu, T., Simamora, M. R., & Ade, S. (2024). Resource-Based View Theory to Achieve a Sustainable Competitive Advantage of the Firm : Systematic Literature Review. *International Journal of Entrepreneurship and Sustainability Studies (IJEASS)*, *4 No. 1 (2*(1), 1–15.

Manley, C. (2024). Pepperdine Digital Commons Leadership best practices in fostering collaboration for transformative change in international nongovernmental organizations : a phenomenological study. *Pepperdine Digital Commons Theses and Dissertations*.

Mawdsley, E. (2012). The changing geographies of foreign aid and development cooperation: Contributions from gift theory. *Transactions of the Institute of British Geographers*, *37*(2), 256–272. https://doi.org/10.1111/j.1475-5661.2011.00467.x

Moshtari, M., Zaefarian, G., & Vanpoucke, E. (2024). How Stakeholder Pressure Affects the Effectiveness of International-Local Nongovernmental Organization Collaboration in Localization of Humanitarian Aid. *Nonprofit and Voluntary Sector Quarterly*, *53(4)*(2024), 866 –897. https://doi.org/10.1177/08997640231196886

Mtunge, R. A., & Mokaya, S. O. (2016). Role Of Non-Governmental Organizations Leadership In The Implementation Of Community Development Projects In Arumeru District , Tanzania. *International Journal of Scientific & Technology Research*, *5*(11 November 2026).

Mwita, K., & Mrema, G. (2023). The Influence of Transformational and Transactional Leadership on Organisational Performance : A Case of a Higher Education Institution in Tanzania. *International Journal Of Humanities Education and Social Sciences (IJHESS)*, *2,5*(April), 1779–1789. https://doi.org/10.55227/ijhess.v2i5.477

NaCoNGO, N. C. O. Ngo. (2023). t. *National Strategy for NGOs Sustainability*, *3708*. https://doi.org/10.46883/onc.2023.3708

Naidoo, G. (2011). Adopting an appropriate leadership approach to improve Public Service Delivery in South Africa. *African Journal of Public Affairs*, *4*(3), 45–59.

Nyambaka, A., & Sagini, W. O. (2024). East African Journal of Business and Economics Strategic Management Practices on the Performance of Non-Government. *East African Journal of Business and Economics*, *7*(2), 261–

Licensed Under Creative Commons Attribution (CC BY-NC)

274.
Onesmo, A., & Mushi, R. (2022). Resource Development for Mission Achievement in Tanzania ' s Walden University. *Walden University ScholarWorks*.
Orwa, M. A., & Odollo, L. (2023). Effect of organizational commitments on performance of Non-Governmental Organizations in Nairobi County. *International Journal of Management and Commerce Innovations*, *10*(2), 68–74. https://doi.org/https://doi.org/10.5281/zenodo.7230072
Salum, V. S., Gakure, R. W., & Othiambo, R. (2017). Impact of Stakeholders on Implementation of Strategic Plans in Tanzania's Public Sector. *Journal of Public Administration and Governance*, *7*(4), 294. https://doi.org/10.5296/jpag.v7i4.12255
Teece, D. J., Pisano, G., & Shuen, A. (2009). Dynamic capabilities and strategic management. *Knowledge and Strategy*, *18*(March), 77–116. https://doi.org/10.4337/9781035334995.00014
Temba, F. I. (2020). Assessing the Role of Stakeholder's Participation on Sustainability of Donor Funded Project. *Disertation*.
Walton, O. E., Davies, T., Thrandardottir, E., & Keating, V. C. (2016). Understanding Contemporary Challenges to INGO Legitimacy: Integrating Top-Down and Bottom-Up Perspectives. *International Society for Third Sector Research*, *27*(6), 2764–2786. https://doi.org/10.1007/s11266-016-9768-2
Wernerfelt, B. (1984). A Resource-based View of the Firm. *Strategic Management Journal*, *5*(June 1982), 171–180.
Wright, P. M., McMahan, G. C., & McWilliams, A. (1994). Human resources and sustained competitive advantage: A resource-based perspective. *The International Journal of Human Resource Management*, *5*(2), 301–326. https://doi.org/10.1080/09585199400000020
Yamane. (1967). Introductory analysis. *A Harper International Edition*, 14–17. https://doi.org/10.2307/2311831

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Social media marketing: The impact of customers' awareness of product, price, and place on social media promotion—evidence from small and medium enterprises (SMEs) in Dar es Salaam, Tanzania

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ABSTRACT

This article aimed to examine the impact of customers' awareness of product, price, and place on social media promotion. The Diffusion of Innovation theory was used to guide the study. The participants in the study were selected customers who visited mobile phone shops at Makumbusho bus stand and Kinondoni B bus stand in Dar-es-Salaam, Tanzania. Specifically, the study focused on the impact of customers' awareness of product, price, and place that was created from the social media platforms on social media promotion, specifically Facebook, WhatsApp, and Instagram platforms, and how data manipulation affects their relationship. A cross-section survey was adopted by a researcher. A closed-ended questionnaire was used to collect data from 85 mobile phone customers, who were randomly and conveniently selected. The regression analysis technique was employed to study the relationship between the studied variables, the customers' awareness of product, price, and place as explanatory variables, and social media promotion as an outcome variable. The study revealed, there was a significant positive relationship between the customers' awareness of price and social media promotion; also, the customers' awareness of place has significant positively impacted social media promotion. However, there was an insignificant positive relationship between the customers' awareness of the product and social media promotion. Also, the study found that data manipulation, specifically by combining two explanatory variables, directly impacted the studied variables. The study recommended that Small and Medium Enterprises (SMEs) should focus on the product attributes, value, and distribution when promoting offers such as discounts through social media platforms like Instagram, WhatsApp, and Facebook.

Keywords: Customers' Awareness, Data Manipulation, Diffusion of Innovation Theory, 4Ps, Social Media Marketing

I. INTRODUCTION

Globally, social media has transformed into a powerful tool for businesses to build customers' relationships, promote products, and foster loyalty. Business uses online networking to upgrade an organizations execution in different courses, for example, to fulfill business goals, expanding yearly offers of the organization (Akram & Kumar, 2018). Additionally, innovations such as Single Sign-On (SSO) systems have amplified the effectiveness of social media by enabling businesses to expand their reach while enhancing customers' trust and loyalty (Lankshear & Knobel, 2007).

In Africa perspective, the rapid increase in internet access and smartphone penetration has positioned social media as a critical tool for communication and commerce. Social media platforms are powerful catalysts in the formation and growth of new small-and-medium-sized business, whereby the use of digital tools such as Facebook, WhatsApp and Instagram, are the vehicles for realizing Africa's with three latent opportunities which are; leverage, women empowerment at economic level and the expansion of intra-African trade, (Olivia, 2021). However, factors such as lack of Information and Communication Technology [ICT] knowledge, unreliable infrastructure, high cost of adoption, the perceived usefulness of ICT, and the perceived ease of use, hinder the adoption process of ICT, (Lubua, 2022). Research in this area often focuses on broader adoption trends but fails to address how businesses can leverage social media to build sustainable customers' relationships.

Within East Africa, the distribution of social media users in term of gender, female users increased from 39% in 2020, to 40% in 2024 (Saifaddin, 2024). Social media is increasingly being used to drive entrepreneurship and innovation. In countries such as Kenya and Uganda, businesses have incorporated social media strategies to expand their customers' base and enhance interactions. Despite this progress, the region faces challenges in creating tailored social media strategies that address local consumer behaviors, particularly in rural areas where digital access is still limited.

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In Tanzania, social media usage has grown steadily, with platforms like WhatsApp, Instagram, and Facebook being widely used for marketing and communication. However, there is limited understanding of how businesses in Tanzania utilize social media to build customers' awareness, trust, and loyalty. Several theories, such as the Content Theory of Social Media and Diffusion of Innovation theory provide valuable insights but remain largely unexplored within the Tanzanian context. Most studies focus on the adoption of social media as a tool for advertising, neglecting its potential in fostering deeper customers' relationships. A study conducted by Swalehe (2021) and another study conducted by Makawa (2023)explained social media marketing factors, concern Small and Medium enterprise .Therefore, this study will add new insight in the marketing field by examining the impact of customers' awareness of product, price and place on social media promotion and how does data manipulation impact their relationship.

1.1 Statement of the Problem

In Tanzania, more than 95% of businesses are Small and Medium Enterprises (SMEs) and contribute about one-third of the country's Gross Domestic product (GDP) and are responsible for generating up to 40% of total employment (TanzaniaInvest, 2023). Research studies have been conducted in Tanzania to explain the contribution of social media marketing in Small and medium Enterprise (SMEs).

The results from multiple regression analysis showed that technological factors, organizational factor and environment factor had positive and significant relationship with the adoption of social media marketing in SMEs (P =.0000), (Makawa, 2023). Use of social media has significant effect on SMEs performance as it contributes to cost effectiveness, customers' satisfaction and market performance, also, it positively affects innovation and branding of SMEs (Shauri. et al, 2023). Users view social media advertising as an important component in building a brand and developing long –term customers' connections; as a result, marketer must be aware of the opportunities and difficulties that lie ahead, and must determine which actions will have the most impact and result in increased brand equity and customers' loyalty so that they do not lose customers' (Sapi & Grace, 2021).

Despite the fact that, recently in Tanzania many studies have been conducted in social media marketing, but still there is the gap in context of how it influences traditional marketing element mix 4Ps (Product, Price, Promotion and Place). Therefore, this study will put new insight by examining the impact of customers' awareness of product, price and place that created from Facebook, WhatsApp and Instagram platforms on social media promotion.

1.2 Research Hypothesis

Ho_1: There is no significant relationship between the customers' awareness of product, price and place, and social media promotion that created from social media platforms.

Ho_2: Data Manipulation by combining two explanatory variables has no effect on the relationship between customers' awareness of product, price and place, and social media promotion that created from social media platforms.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Diffusion of Innovations Theory

Diffusion of Innovations is a theory profound by Everett Rogers that seeks to explain how, why, and at what rate new ideas and technology spread. An innovation is communicated through certain channels over time among the members of a social system, (Rogers, 2003). However, this theory is relevant to social media marketing as it provides a ground knowledge to understand marketing messages and campaign spread and are adopted with in online communities. The theory is applicable by marketers, because it helps them to create content that capture the large number of their targeted audiences.

2.2 Empirical Studies

Empirically, many researchers conducted various studies to explain the concept of Instagram on other aspects such as brand and sales. The study conducted by Jong (2018), "The effects of Instagram Advertising on brand awareness, Ad intrusiveness, Brand Attitude and purchase Intensions" , the researcher was aimed to explain the theory which shows the relationship that exist between three type of Instagram advertisement which are story advertisement, picture advertisement and influencer marketing on brand awareness, by testing whether or not story advertisements leads to higher awareness on brand compared to the photo advertisement and influencer marketing condition.

One-way ANOVA was conducted and the result indicated that, there was a significant effect between the experimental conditions and brand awareness ($F(2,79) = 3.30$, $p=.04$, partial $\eta^2=.08$). However, this study added new sight to the researcher's study topic, by shown the effect of Instagram on brand awareness, while the researcher demonstrated the impact of Instagram in creating customers' awareness on products, price, promotion and place.

Rahayuningrat et al (2021)conducted a systematic literature review about the effectiveness of Instagram advertising for digital marketing strategy, and the study concluded that, Instagram advertising is very effective in helping

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digital marketing, because as compared to Facebook and YouTube, Instagram user value the informative dimension the most.

The study conducted by ARD-ZDF-Onlinestudie (2019), found that 75% of the population use WhatsApp at least weekly, 63% even daily, the participants said they like using WhatsApp because it's so intuitive to use and I allow them to reach the majority of their contacts. Also one mobile phone dealer said that "We have seen that the use of WhatsApp and other chat tools has significantly increased over the last years. It's not just something millennials use- the expectations for communication channels have changed for older generation as well". Therefore, this shown that the researcher finding has correlated with other findings which suggested that WhatsApp has a great impact on customers' awareness.

Also the study conducted by Amin (2019),"An analysis on the impact of Facebook marketing on Brand awareness", a case study of Glaxo Smithkline Bangladesh product "Horlick", whereby he tested the null hypothesis (H_o) which hold that 'user generated content has a negative impact on brand awareness, while the alternative hypothesis stated that 'user generated content has positive impact on brand awareness', Correlation analysis conducted and the result indicated that, at Pearson correlation (r) equal to 0.856 shown the positive and strong correlation between user generated content and brand awareness.

According to Marrs (2020), explained about the 7 ways to use Facebook for marketing, however, this added new insight to the researcher study topic by explaining the ways from which the mobile phone dealers' can cope with, so as to understand the Facebook marketing, which in turn can bring positive outcome to their business such as Increase on brand and customers'' awareness. However, she put forward the follows ways to use on Facebook Marketing.

Facebook Advertising: Classic Ads; this helps the business owner to increase likes or driving website clicks, because Facebook advertising feature includes, the ability to set ad budgets, the ability to advertise for your particular area and Demographic targeting by Facebook user data on age, location, education and interests. Hosting Facebook Contests; Brand awareness as well as fans can be increased through running the Facebook contests or sweepstakes. However, this can be done through paid as well as free tools such as Short-stack and Pagemodo.

Facebook Promoted Posts; Facebook Promoted Posts are paid form of promotion for the purpose of reaching a certain number of users, increasing a specific post's reach and impression. It cost only $5.00 to get started Facebook Promoted Post's. Sponsored Stories; Sponsored stories, are a type of Facebook as that seeks to capitalize on the "word of mouth" marketing concept that shows a user's interactions, such as Facebook comment, to user's friends. However, Facebook claims that Sponsored stories have 46% higher CTRs and 20% lower CPCs than regular Facebook ads (Marrs, 2020).

Facebook Open Graph; however, Facebook Open Graph can create third-party apps that connect to a user and post a notice on Facebook when a user performs a specific action with the app such as "like" and "comment". Facebook Exchange (FBX); The CTR for Facebook Exchange ads is 40% lower than for other web retargeting ads, like those offered by the Google Display Network (Marrs, 2020).

III. METHODOLOGY

3.1 Research Approach and Design

A cross-sectional survey design was adopted by a researcher so as to obtain quickly and large volume data with a large number of variables (Kothari, 2009). Quantitative approach was adopted by researcher so as to obtain numerical data for further analysis, such as regression analysis.

3.2 Study Area and Population

The study was conducted at Kinondoni district/Dar es Salaam, specifically Makumbusho bus stand and Kinondoni B bus stand. Dar es Salaam is located at 6°48 South and 39°17' E of Tanzania, it is the largest business city in Tanzania which ranked number 7 in Africa and it's an icon for the economic growth of Tanzania since it is the economic center (Nyyssola et al, 2021) . However, Dar es Salaam/Tanzania has chosen because of large number of people who use social media platforms in the context of Instagram, WhatsApp and Facebook for both personal and business purposes. According to data published in Meta's advertising resources indicates that, Facebook had 5.65 million users, Instagram had 3.50 million users and WhatsApp had users in Tanzania in early 2024, (Kemp, 2024).The population of the study from which sample was drown, involves customers' who visited mobile shop dealers from the studied area.

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3.3 Sample Size and Sampling Technique

The sample was randomly and conveniently selected from the population of the customers' who visited mobile phone shops. The formula that put forward by Tabachnik and Fidell (2013), which is n > 50 + 8m, was used to calculate the number of sample size, whereby 85 customers' who visited mobile phone shops at Makumbusho bus stand and Kinondoni B bus stand was used as the unity of analysis.

n > 50 + 8m

Notation

n = Number of Sample Size

m = Number of independent variable within a research study model

From the research study model there are three (3) explanatory variables. Therefore, m is equal to 3.

n > 50 + 8(3)

n > 50 + 24

n > 74

In order for the explanatory variables to explain the outcome variable the number of sample size must be greater than seventy-four (74). Hence, a researcher opted to use 85 respondents.

3.4 Data Collection and Analysis

The primary and secondary data was involved and collected from the mobile phone customers' using both close-ended questionnaire and secondary sources such as Library and internet source, respectively. A five (5) Likert scale that range from very high to very low were used to measure the influence of which explanatory variables have over the outcome variable. A Likert scale was used since it is more reliable as compared to Thurstone-type scale, because it gives a chance to a respondents to answer each statement included in the instrument (Kothari, 2004) .The collected data were quantitatively analyzed using the multiple regression analysis techniques with the aid of Statistical Package for Social Science (SPSS) program version 20. However, a multiple regression equation modal was generated which aimed to explain the relationship between the outcome variable; Social media promotion and explanatory variables; customer awareness of product, price and place that created from social media platforms.

IV. FINDINGS & DISCUSSION

4.1 There is no significant Relationship between the Customers' Awareness of Product, Price and Place, and Social Media Promotion that created from social media platforms.

4.1.1 Multiple Regression Equation Model One

The aim of this relationship was to get the multiple regression equation model that will explain the relationship existed between the customers' awareness of product, price and place that created from Facebook, WhatsApp and Instagram platforms as an explanatory variables and social media promotion as an outcome variable.

General modal that measure their relationship

$$\mathbf{PmT = a + b_1ProT + b_2PrT + b_3PlaT + £}$$

Whereby

PmT=Social media promotion that created from Facebook, WhatsApp and Instagram platforms.

ProT= Customers' awareness of products that created from s Facebook, WhatsApp and Instagram platforms

PrT= Customers' awareness of price that created from Facebook, WhatsApp and Instagram platforms

PlaT= Customers' awareness of place that created from Facebook, WhatsApp and Instagram platforms

a = Constant term

£ = Standard error

Table 2

Model Summary of the Promotion

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.914[a]	.835	.829	.34535	.835	137.025	3	81	.000

a. Predictors: (Constant), PlaT, ProT, PrT

b. Dependent Variable: PmT

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Table 3

Coefficients[a] of the Promotion

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.124	.127		.977	.332
	ProT	.027	.126	.027	.217	.829
	PrT	.507	.136	.479	3.726	.000
	PlaT	.439	.088	.445	4.977	.000

a. Dependent Variable: PmT

4.2.2 Interpretation of the Output from SPSS

From the model Summary box, the regression model was very good because R square is 0.835 which is greater than 0.5, also the overall relationship was Significant (F=137.025, P<0.01).

The result found that, Social media promotion that created from Facebook, WhatsApp and Instagram (PmT) was increasing by, 0.027 when you increase the customers' awareness of product that created Facebook, WhatsApp and Instagram (ProT), and by 0.507 when you increase the customers' awareness of price that created from Facebook, WhatsApp and Instagram (PrT) and by 0.439 when you increase the customers' awareness of place that created Facebook, WhatsApp and Instagram (PlaT).

The effect of customers' awareness of price that created from Facebook, WhatsApp and Instagram (PrT) and The customers' awareness of place that created from Facebook, WhatsApp and Instagram (PlaT) was significant (t= 3.726, P<0.01) and (t=4.977, P<0.01) respectively.

Hence, the general regression Model

PmT= 0.124 + 0.507PrT + 0.439PlaT + 0.027ProT + £

4.2.3 Model Explained

Nevertheless, modal above shows its implication in a business sector; Because customers' whenever they interact with company's offers and promotion in digital channels such as social media platforms like Instagram, WhatsApp and Facebook or any other traditional media such as radio and television are more focusing on price rather than the place or the product itself. This is due to the fact that; customers are price sensitivity. NewtonX (2023), explain the reasons why customers' are price sensitive, which are perceived value, economic conditions, competitive pricing, brand loyalty, availability of substitutes, income level, lastly is promotions and discounts. Price is most influencing factor for buying a product on consumers' view and for earning profit from selling the product on manufacturers' view (Robel et al, 2014).

Customers' after knowing that they can afford the price for the given product, then come to the question; Does the offer/promotion accessible? This question helps the customers to make decision on whether to accept the offer/promotion or not. However, this gives the SMEs opportunity to make sure that, they create time and place utility for the promoted offer, so as to make the offer visible and accessible. Place selections are vital to the success of marketing strategies because they determine the channels of distribution that allow for the customer accessibility and satisfaction, (Prakriti, 2023).

However, during the promotion campaign of the product (existing product) such as discount allowance through social medias channel or any other traditional medias, the customers' would consider the product as the last comparing factors when they want to make the decision on whether or not to accept the offer, as compared to the price and the accessibility of that product. This due to the fact that, the product is at maturity stage of the product life cycle, so the customers are full or partially aware about the products in terms of their usefulness and benefits. Yaduraj (2016), explained about the product life cycle and it characteristics.

In conclusion, SMEs like mobile phone dealers should consider the price of the promoted products and its accessibility, since it leads to the increase on customers' awareness because it is what they focusing when they want to make decision on whether or not to accept the offer such as Discount rather than the product itself.

4.3 Data Manipulation by Combining Two Explanatory Variables has no effect on the Relationship between the Customers' Awareness of Product, Price and Place, and Social Media Promotion that created from social media platforms.

4.3.1 Multiple Regression Equation Model Two

The aim of this relationship was to get the multiple regression equation model that will explain the relationship between the customers' awareness of product, price and place that created from Facebook, WhatsApp and Instagram platforms and social media promotion. Variables was manipulated which resulted new variable to be formed that combine the customers' awareness of product and the customers' awareness of price (ProTPrT) that created from Facebook, WhatsApp and Instagram platforms.

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General modal that measure their relationship

PmT= a + b1ProTPrT + b2PlaT + £

Table 4

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.910[a]	.828	.823	.35132	.828	196.746	2	82	.000

a. Predictors: (Constant), ProTPrT, PlaT

Table 5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.187	.125		1.495	.139
	PlaT	.452	.090	.458	5.046	.000
	ProTPrT	.512	.096	.485	5.345	.000

a. Dependent Variable: PmT

From the model Summary box, the regression model was very good because R square is 0.826 which is greater than 0.5, also the overall relationship was Significant (F=196.746, P<0.01).

The result shown that social media promotion that created from Facebook, WhatsApp and Instagram (PmT) was increasing by, 0.512 when you increase the customers' awareness of product and the customers' awareness of price that created from Facebook, WhatsApp and Instagram platforms (ProTPrT) and by 0.452 when you increase the customers' awareness of place that created from Facebook, WhatsApp and Instagram (PlaT).

Both, customers' awareness of product and the customers' awareness of price that created from Facebook, WhatsApp and Instagram platforms, and the customers' awareness of place that created from Facebook, WhatsApp and Instagram platforms (PlaT) was significant (t= 3.726, P<0.01) and (t=4.977, P<0.01) respectively.

Hence, the general regression Model

PmT= 0.187 + 0.512ProTPrT + 0.452PlaT + £

4.3.2 Modal Explained Compared to Hypothesis One

Manipulation of data after combing two explanatory variables which are customers' awareness of product (**ProT)** and the customers' awareness of price (**PrT**) leads to the formation of new variable which is **ProTPrT**, this combination was due to fact that customers' are merely considering product as compared to the price when they encounter with company's offer/promotions on social media platforms such as Facebook, WhatsApp and Instagram.

This combination affects the regression equation modal as a result R square to decrease at low decreasing rate from 0.835 to 0.828, though both regression equation modals remain significant (P<0.01). However, this shown that data manipulation by combining two variables might lead to the decrease in R square change by small changing rate. Before data manipulation, the customers' awareness of product (**ProT)** was insignificant to social media promotion **(PmT)** because its probability was above 0.01(P=0.829), at a change rate of 0.027 per unit, which is very small change.

Furthermore, the customers' awareness of price was significant to social media promotion **(PmT),** due to the fact that, its probability was below 0.001(P=0.00), where by, the coefficient rate of change per unit at which customers' awareness of price impacted social media promotion was 0.507. However, after the formulation of new variable **ProTPrT**, the customers' awareness of product become significant to social media promotion (P=0.00), where by, the coefficient rate of change increased from 0.507 to 0.512.

In conclusion, this shown that data manipulation by combining two explanatory variables may lead to the increase in coefficient change of rate per unit at which two combined variables has an impact on outcome variables, as compared to the change of rate per unit at which each explanatory variable has an impact on an outcome variable separately. However, their combination changes the way of which one explanatory variable statistically signify the outcome variable, from being statistically insignificant to statistically significant as shown in previous explanation.

However, this might be useful to the business practitioners like SMEs such as mobile phone dealers, in a way that, whenever they want to increase the level of customers' awareness of their offers/promotions such as price discounts, through social media platforms specifically, Instagram, WhatsApp and Facebook, they should promote their offers by reminding their customers' not only the price allowance of that product such as discount, but also the product itself by considering its attributes such as product quality, usefulness, benefits and disposition. Nevertheless, this reduce the time by which the customers spend in making decision on whether or not to accept the offers.

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4.4 Discussion

This study has revealed that, there was a positive significant relationship between the customers' awareness of price that created from Facebook, WhatsApp and Instagram platforms, and social media promotion .However, based on literature review this argument is supported by the study conducted by Mariana (2021), about the influence of social media promotion strategies on price-mediated purchase decision, a case study at P.T Lazada Bandung In Indonesia, after conducted the sobel test the study found that, social media promotion strategies has significant relationship with the price variables. This evidenced by findings, that organization that build promotions through social media are more effective and efficient, especially in terms of price variables, also, the result of this study is supported by Wawrowski and Otola (2020), which claims that social media promotion strategies have an effect on price variables.

Nevertheless, the study found that, social media promotion has significant positive relationship with the customers' awareness of place that created from Facebook, WhatsApp and Instagram platforms. This argument is supported by Maryville (2020), provided explanation to answer the question, marketing in the 21st Century: How does digital marketing affect the Marketing mix?, He put forward four direct impacts in which digital marketing such as social media marketing has on the marketing mix, which include, advertising recognition and avoidance, customers' service, influencer and barrier to entry.

Furthermore, the study revealed that, there is insignificant positive relationship between the customers' awareness of the product that created from Facebook, WhatsApp and Instagram platform, and social media promotions. This was due to the facts that, whenever customers interact with promotion ads in social media platform such as Instagram, they always focus on the value and the accessibility of that product, rather than the product itself. However, this argument contradicted by Howard (2011), who explained on how does the traditional marketing mix fit in the social media?, and concluded that, physical attributes of the product such as functionality, appearance and quality of the product does not fit in social media, because it does not have a direct impact rather than it provide some modern ways to promote your brand.

However, the current study provides the new insight from those provided in previous including the study conducted by Tritanie (2016) ,"The effect of social media to the brand awareness of a product of a company", whereby quantitative research approach was employed and explanatory research design was used by a researcher. The findings suggested that, social media gives a significant influence on a company's product awareness in the community. A researcher, Kihombo (2019) conducted the study on the role of social media on small/medium business performance at Kinondoni Municipal in Dar es Salaam city, Tanzania. Descriptive research design employed, whereby the samples were selected through simple random sampling and purposive sampling, both qualitative and quantitative approach were used. It was found that, social media plays a great role on the general performance of small and medium business, this means that, the business operating through social media perform higher than those which are not operating through social media. Also, the researcher, revealed that, there are challenges in which customers' face during the business transaction or exchange through social media which are such as poor customer's service, lack of trust and absence of direct access on sellers' accounts.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

Based on the findings of the study, the findings indicate that customers' awareness of products, price and place that created from social media platform such as Facebook and Instagram has significant impact on social media promotion. whereby many business practitioners now days are using social media platforms such as Facebook, WhatsApp and Instagram platforms, and other platforms for marketing purpose such as to connect with target audience, build brand awareness, online promotion and ultimately drive business growth.

The Tanzanian government has played a crucial role in enhancing access and availability of affordable and reliable broadband services to accelerate socio-economic development of the society though infrastructure development, which includes construction of national data center, internet exchange point, and the participation of private sector in metro fiber investment. These efforts have encouraged both small, medium and large enterprise to use digital marketing such as social media platform, for the business purpose.

5.2 Recommendations

The use of ICT has changed the way people do their business, but still there are challenges concerning about the issue of ICT security, safety and standardization, such as public understanding of safety related issues in ICT; lack of appropriate frameworks that address safety issues of ICT equipment, products, services, information systems and mobile applications; managing electronic waste; protecting children online and regulation of online content which is detrimental to national culture. Therefore, the governments should prioritize these issues so as to ensure secure environment that build confidence and trust in the use of ICT product and service.

REFERENCES

Licensed Under Creative Commons Attribution (CC BY-NC)

Akram, W., & Kumar, R. (2018). A study on positive and negative effects of social media on society. *International Journal of Computer Sciences and Engineering, 5*(10), 347–354.

Amin, M. (2019). An analysis on the impact of Facebook marketing on brand awareness: A case study of GlaxoSmithKline Bangladesh's product "Horlicks". *Journal of Business Studies, 39*(2), 96–111.

ARD-ZDF-Onlinestudie. (2019). Retrieved from https://www.userlike.com/en/blog/whatsapp-statistics

Howard, J. (2011, July 23). Does social media fit into the traditional marketing mix (4 P's)? Retrieved from Frontera Marketing Group: https://frontelahouse.com/blog/does-social-media-fit-into-the-traditional-marketing-mix-4ps/

Jong, L. d. (2018). The effect of Instagram advertising on brand awareness, ad intrusiveness, brand attitude, and purchase intentions (Master's thesis, University of Amsterdam, Netherlands).

Kemp, S. (2024, February 23). Digital 2024: Tanzania. DataReportal. https://datareportal.com/reports/digital-2024-tanzania#:~:text=Tanzania%20was%20home%20to%205.65,percent%20of%20the%20total%20population

Kihombo, B. (2019). The role of social media on small/medium business performance: A case of Kinondoni Municipal. Dar es Salaam, Tanzania: Mzumbe University.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd rev. ed.). New Delhi: New Age International (P) Limited, Publishers.

Kothari, C. R. (2009). *Research methodology: Methods and techniques* (2nd rev. ed.). New Delhi: New Age International Publishers (P) Ltd.

Lankshear, C., & Knobel, M. (2007). *New literacies: Everyday practices and classroom learning*. Maidenhead, UK: Open University Press.

Lubua, E. W. (2022). Factors affecting the adoption of information and communication technologies in Africa: Literature review. *African Conference of Information Systems and Technology Proceedings, 8*(1), 1–14.

Makawa, N. (2023). The determinants of social media marketing adoption among small and medium enterprises (SMEs) in Ilala Municipality, Dar es Salaam, Tanzania. *African Journal of Accounting and Social Science Studies, 4*(2), 159–182.

Mariana, A. (2021). The influence of social media promotion strategies on price-mediated purchase decisions. *Psychology and Education Journal, 53*(3), 2763–2772.

Marrs, M. (2020, September 25). 7 ways to use Facebook for marketing. WordStream. https://www.wordstream.com/blog/ws/2013/04/15/facebook-marketing

Maryville University. (2020, February 28). Marketing in the 21st century: How does digital media affect the marketing mix? https://online.maryville.edu/blog/how-does-digital-media-affect-the-marketing-mix/

NewtonX. (2023, December 12). How price sensitivity influences customer buying behavior. https://www.newtonx.com/article/price-sensitivity

Nyyssola, M., Kelsall, T., & Ndezi, T. (2021). Dar es Salaam: City scoping study. Manchester, UK: African Cities Research Consortium. https://www.mikuminationalpark.net/dar-es-salaam-city/#::text=Dar%20es%20Salaam%20is%20located

Olivia, N. (2021, June 28). How social media is powering small business in Africa. Genesis Unlocking Value. https://www.genesis-analytics.com/reports-and-other-documents/how-social-media-is-powering-small-business-in-africa-report

Prakriti, D. P. (2023). Place decisions and the 4P's of marketing: Enhancing the channels of distribution for customer accessibility and satisfaction. *International Journal of Research and Analytical Reviews, 10*(3), 973–977.

Rahayuningrat, S. P., Ardiani, G. T., Alisa, J., & Sugiarti, R. (2021). The effectiveness of Instagram advertising for digital marketing strategy: Systematic literature review. *International Journal of Tourism and Hospitality in Asia Pacific, 7*(1), 14–26.

Robel, S. D., et al. (2014). A critical review of consumers' sensitivity to price: Managerial and theoretical issues. *Journal of International Business and Economics, 2*(2), 1–9.

Rogers, E. M. (2003). *Diffusion of innovation* (5th ed.). Glencoe, IL: Free Press.

Saifaddin, G. (2024, February 29). Distribution of social media users in Eastern Africa from 2020 to 2024, by gender. Statista. https://www.statista.com/statistics/1326148/distribution-of-social-media-users-in-eastern-africa-by-gender/

Sapi, H., & Grace, I. (2021). Influence of excessive social media advertisement on consumer purchase behaviour in Tanzania. Institute of Accounting Arusha Repository. ISSN: 2714-1993.

Shauri, N. E., et al. (2023). Utilization of social media and its implication on the performance of SMEs in Dodoma City, Tanzania. *Open Journal of Business and Management, 11*(2), 660–672. https://doi.org/10.4236/ojbm.2023.112035

Swalehe, O. (2021). The determinants of adoption of social media marketing among SMEs in Tanzania. *The IUP Journal of Marketing Management, 20*(1), 7–39. SSRN: https://ssrn.com/abstract=3907101

Licensed Under Creative Commons Attribution (CC BY-NC)

Tabachnik, B., & Fidell, L. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.

TanzaniaInvest. (2023, February 8). SMEs in Tanzania. Tanzania Investment. https://www.tanzaniainvest.com/smes#:~:text=SMEs%20contribute%20about%201%2F3,to%2040%25%20of%20total%20employment

Tritanie, H., & Tarigan, R. (2016). The effect of social media to the brand awareness of a product company. *CommIT (Communication and Information Technology), 10*(1), 9–14.

Wawrowski, B., & Otola, I. (2020). Social media marketing in creative industries: How to use social media marketing to promote computer games? *Information, 11*(5), 242–255.

Yaduraj, S. Y. (2016). A study of product life cycle. *IOSR Journal of Business and Management*, *18*(2), 87–89.

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A systematic review of factors influencing learning management system usage in higher learning institutions across the East African Community

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ABSTRACT

In this digital era, the use of learning management systems in education as an attempt to improve teaching and learning delivery has become a central concern. Despite significant investment in Information Communication and Technology (ICT) infrastructure, higher learning institutions across the East African Community continue to face diverse challenges that hinder full utilization. This study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT) and Technology-Organization-Environment (TOE) framework to present a systematic review of literature published between 2015 and 2025, focusing on the most critical factors influencing Learning Management System usage in the East African Community. The literature was identified through six electronic databases guided by the Reporting Items for Systematic Reviews and Meta-Analyses framework; 92 academic articles were identified and critically analyzed. The results revealed that 28 studies primarily focused on Kenya. The Technology Acceptance Model was the dominant model employed, and students were the main subject of studies. Moreover, the quantitative approach was the preferred design. Overall, thirty-nine factors were identified. The study concludes that the East African Community requires a multi-dimensional approach combining continuous training, supportive policies, and robust ICT infrastructure, including high-speed internet connectivity and strengthened mobile technology. This review will be useful for future research and higher education decision-makers who plan to use online learning to overcome the challenges they face in utilizing LMS effectively. The study was limited to link usage and learning outcomes; therefore, future work should employ stronger designs, incorporate lecturer and administrator perspectives, and integrate multi-level theories to link usage with learning outcomes.

Keywords: East Africa Community, Learning Management System, Higher Learning Institutions, Usage

I. INTRODUCTION

In East Africa Community (EAC), there is increased adoption of Learning Management System (LMS) that enhanced teaching and learning delivery to support face-to-face traditional environments in Higher Learning Institutions (HLIs) (Araka et al., 2021; Gamede et al., 2021; Mare et al., 2023). This adoption has been stimulated by the investment in various learning management systems, availability of internet and other digital technologies such as laptops, desktops, smart phones, tablets, and among others aiming at improving the quality of teaching and learning (Mtebe, 2020; Duruhan, 2020; Yunus, 2021). Despite the fast adoption, there is low usage of these systems amongst EAC users (Mtebe, 2020; Mtani & Mbelwa, 2022; Vincent et al., 2020). The successful use of LMS relies on understanding the usage factors as well as the main challenges that face the current online learning systems (Almaiah et al., 2020). This may result from several factors, such as those related to technological factors, individual factors, institutional factors, and socio-cultural factors, which may inhibit the usage of LMS among lecturers. In order to increase the level of LMS usage, countries in the EAC (Kenya, Tanzania, Uganda, Rwanda, Burundi, Congo, Somalia, and South Sudan) should understand the relevant adoption models, theories and challenges facing the utilization of LMS. Therefore, this study investigated the critical factors influencing the usage of LMS in HLIs across the EAC region.

It is argued that technology-based teaching and learning has established a new educational ground for lecturers and students by removing time and place constraints (Endres & Chowdhury, 2019; GÜRCAN & ÖZYURT, 2020). In this digital era, the use of Learning Management Systems in education as an attempt to improve teaching and learning delivery has become a central concern. United Nations Environmental, Scientific and Cultural Organization [UNESCO] reported that "ICT must be harnessed to strengthen education systems, disseminate knowledge, provide access to information, promote quality and effective learning and deliver services more efficiently" (UNESCO, 2023). The use of LMS will help achieve global goal number 4. This goal aims to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (UNESCO, 2021b). Due to the increase in enrollment of higher learning students, face-to-face learning delivery is not adequate to bring about quality education; therefore, the use of modern approaches such as online and blended learning, which are supported by LMSs, is necessary. Alsswey et al., (2020) argues that increasing demand for higher education cannot be met solely through traditional face-to-face learning delivery; therefore, it is advantageous to use modern approaches such as eLearning, blended and online learning, which

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are supported by LMSs. These methods stimulate the teaching and learning process and enhance communication between users at all times and locations, enabling students to engage with the material at their pace, helps better manage users and courses by providing reports and activity notifications (Khetsiwe Eunice & Cosmas, 2020; Sinclair & Aho, 2018)

Even though the increasing number of systematic reviews papers examining LMS adoption worldwide (van der Merwe et al., 2023; Ziraba et al., 2020; Gamage et al., 2022; Mousa et al., 2020; Maluleke & Maake, 2025), none of these have investigated the factors influencing the usage of LMS in EAC. The aim of conducting this study is to address this research gap. A main factor observed by past studies has to do with the challenges of preliminary adoption of LMS. Alsswey et al., (2020) state that failure rates of adopting LMSs are high regardless of their benefits. Despite key challenges pointed by various research findings including (Nkata, 2020; Ndibalema, 2025; UNESCO, 2021; UNICEF, 2021) that continue to exist and hinder the effective utilization of LMSs; no systematic review paper provided a comprehensive view of the LMS use in the EAC. This raises a need to collect these studies from the last ten years to establish the challenges and factors for LMS usage in EAC.

This systematic review study aim to collect and summarize the factors influencing LMS usage across the East African Community (EAC), and it will serve as a resource for Higher Learning Institutions on effective ways to utilize LMS. The findings are expected to pinpoints best practice and provide actionable insights that can improve the usage of LMS in Higher Learning Institutions across the region. Ultimately, top management, facilitators, students, policy makers, LMS administrators and other researchers will have the baseline to effective utilize the Learning management systems. The next part will describe the methodology used for the review, including the scope of the study, the search strategy employed to identify relevant literature, and the methods used to analyze the data. The third part will present the results and discussion. Finally, the paper will conclude with a summary of the necessary findings as a response to research questions aimed to fill the study gap.

1.2 Research Questions

i. Which countries have most contributed to LMS studies within EAC?
ii. Which models have been most used to study LMS usage in EAC?
iii. What methodologies have been employed in studying LMS usage in EAC?
iv. What are the critical factors influencing the usage of LMS in EAC?

II. LITERATURE REVIEW

2.1 Theoretical Review

The adoption and usage of LMS in EAC Higher Learning Institutions (HLIs) can best be provided a comprehensive view through the integrated framework combining the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al., (2003) and the Technology-Organization-Environment (TOE) developed by Tornatzky and Fleischer, (1990). This study therefore adopts a hybrid model that combines individual and organizational models to explain LMS adoption and usage within EAC HLIs. A similar approach was used by Bouteraa, (2024), Tan and Lee, (2024), and Ates & Polat, (2025). Tan and Lee, (2024)argue that the Unified Theory of Acceptance and Use of Technology (UTAUT) and the Technology-Organization-Environment (TOE) model have become prominent tools to assess and understand adoption and use behaviors towards specific technologies.

According to Venkatesh et al., (2003), the UTAUT is a model that combines theories and frameworks of the Technology Acceptance Model, Innovation Diffusion Theory (IDT), Theory of Planned Behavior (TPB), PC Utilization Model, Motivational Model, Theory of Reasoned Action (TRA), and Social Cognitive Theory (SCT). The UTAUT model explains behavioral intention to use LMS by focusing on factors at the individual level, including performance expectancy (PE), social influence (SI), effort expectancy (EE), and facilitating conditions (FC) (Abbad, 2021). Performance expectancy refers to the degree to which an individual believes that using the LMS will improve teaching quality and student engagement. Social influence refers to the impact of colleagues on the intention to adopt and use LMS. Effort expectancy refers to the degree of ease of use and perceived simplicity of using LMS in facilitating the teaching and learning process. Facilitating conditions refers to the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the LMS. In the study of Abbad (2021), it was found that performance expectancy, effort expectancy, and social influences are directly associated with behavioral intentions, while the final facilitating conditions are associated with actual usage. In addition, behavioral intentions are influenced by gender, age, experience, and voluntariness of use.

While UTAUT emphasizes the individual factors influencing adoption and usage of LMS, the TOE framework addresses organizational factors that have not been captured by the UTAUT model to fill the gap of using one model. According to Abdurrahman et al., (2024), the TOE model assesses how technological attributes, organizational readiness, and environmental conditions shape technology adoption. The technology factors include complexity, relative advantage, and compatibility. The organizational factors, which include the role of management support, user training,

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and resource availability, can either foster or hinder the adoption and usage of LMS. Lastly, the environmental factors consider external influences, such as government policies, competitive pressure, and vendor support, which can impact users' decisions to adopt and use LMS.

In combining UTAUT and TOE Theory, this study provides a more comprehensive framework for understanding both individual behavioral intentions and organizational factors that influence the adoption and usage of LMS in higher learning institutions across the EAC region.

2.2 Conceptual Review

2.2.1 LMS in Higher Education

The LMS in education is a comprehensive digital platform designed to enable educational institutions to manage, deliver, and track educational content and activities in an organized and efficient manner using the Internet (Al-Nuaimi & Al-Emran, 2021). Globally, higher educational institutions have gradually transformed the teaching and learning process into a new learning environment. This shift is due to the impact of the availability of the internet and other digital technologies such as laptops, desktops, smartphones, tablets, and others (Duruhan, 2020; Yunus, 2021). Learning Management Systems (LMS) encourage personalized learning, promote educational equity, provide immediate feedback and assessments, and enable learning anytime and anywhere. As a result, many higher education institutions have integrated LMSs as a core component of their educational frameworks (Lytras et al., 2022).

In EAC, LMSs have played a significant role in improving access to higher education, particularly during and after the COVID-19 pandemic. These platforms enabled the delivery of education to learners remotely, ensuring the continuity of classes across the world without traditional face-to-face classes (Ngala, 2024). The traditional face-to-face approach is supplemented by LMS; the systems enhance the quality of face-to-face delivery by enabling learners to independently access course content (Innocent, 2020; Mtani & Mbelwa, 2022; Mtebe & Raphael, 2018; Nkata, 2020). Therefore, in this digitalization world, the higher learning institutions are required to adopt and use LMS to supplement the face-to-face learning mode (Higher Education for Economic Transformation [HEET], 2021; NACTVET, 2024; UNESCO, 2023).

Despite the advantages of having these LMS in higher learning institutions across the EAC region, usage is still a challenging problem (Mtani & Mbelwa, 2022). This review therefore explores the individual and organizational factors influencing the usage of LMS in HLIs across EAC.

III. METHODOLOGY

To answer the research questions, four phases of Preferred Reporting Items for Systematic Reviews and MetaAnalyses (PRISMA): identification, screening, eligibility, and inclusion criteria were adopted. A similar approach was used by (Maluleke & Maake, 2025; Mousa et al., 2020). During the identification phase, articles were identified through online database searches and duplicates were removing in screening phase to get the actual total number of articles. During the identification phase, all search results from databases (Google Scholar, IEEE, Springer, Science Direct, Scopus, and Emerald) were stored in the Mendeley citation manager. The software identified articles that appeared multiple times across different databases, then manually verified and removed them. Furthermore, the relevant articles were selected by screening the titles and abstracts against the inclusion criteria (study focus on LMS usage, higher learning institutions, EAC, range of publication years, and review study design). Articles that did not meet these criteria were excluded. Additionally, the full text of the remaining articles was assessed. The study failed to satisfy all criteria, including theoretical focus, methodology used, and study objective, which were removed. The papers were not under the scope of the study were excluded in eligibility phase to meet the number of eligible articles. Lastly, the inclusion phase was performed to obtain the articles to be involved in final analysis.

Six online databases were used in searching relevant information that is in the scope of the study: Google Scholar, IEEE, Springer, Science Direct, Scopus, and Emerald. A set of combination keywords including "Online Learning" OR "Learning Management System" OR "eLearning" OR 'LMS' OR "Mobile Learning", "Moodle" OR "Google Class" OR "Blackboard" OR "Blended Learning" OR "Course Management System" AND "Usage" OR "Utilization" OR "Implementation" OR "acceptance" AND "East Africa Community (including Burundi, Congo, Kenya, Rwanda, Somalia, South Sudan, Tanzania, and Uganda,) OR "higher education institutions" OR "universities" OR "higher learning institutions". Microsoft Excel was used to store and document the articles acquired after inclusion and exclusion processes have been completed.

The criteria for selecting an article was adopted from PRISMA guidelines as clarified by (Page et al., 2021). The following selection criteria of selecting articles were used; **language**: Publication in English, **topic**: Focus on the use of Learning Management Systems (LMSs) in higher education, **setting**: Emphasis on higher learning institutions, **relevance**: Directly address factors that influence the LMS usage, and **timeframe**: Published between 2015 and 2025 to ensure inclusion of recent literature. Therefore, Articles not published in English were excluded. Also, papers that did not specifically investigate usage of LMSs in the context of higher education were excluded to maintain focus and

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relevance. Moreover, publications not centered on higher learning institutions were not included in the study. Furthermore, only studies publish between 2015 to 2025 was included to align with the study scope. Also, only studies were conducted across EAC were included in the study.

The total articles of 3215 were obtained in initial search without applying elimination criteria. After removing all the duplicates, the total number of remaining articles was 3007. After reviewing the titles and abstracts only 927 articles were qualified for next selection process. The 45 reports were not retrieved; therefore, only 882 articles were assessed for eligibility. Among these articles, 12 removed on language criteria, 182 articles were irrelevant, 64 articles were not set at higher learning institutions (HLIs), 207 articles were out of timeframe, and 306 articles were not centered at EAC, and 19 articles were not met acceptable quality. A quality appraisal was conducted to evaluate methodological accuracy. This study adapts the mixed methods appraisal tool (MMAT) to accept the articles that meet the quality appraisal. The mixed methods appraisal tool (MMAT) was developed for critically appraising different study designs based on criteria such as clarity of research design, sampling technique, data collection method, analytical correctness, and reporting transparency (Bartlett et al., 2019). This led to 92 articles that met the criteria for inclusion in this study. Appendix A summarize the reviewed articles that were selected, and figure 1 below reviews the procedure of the literature search and screening used to obtain final articles.

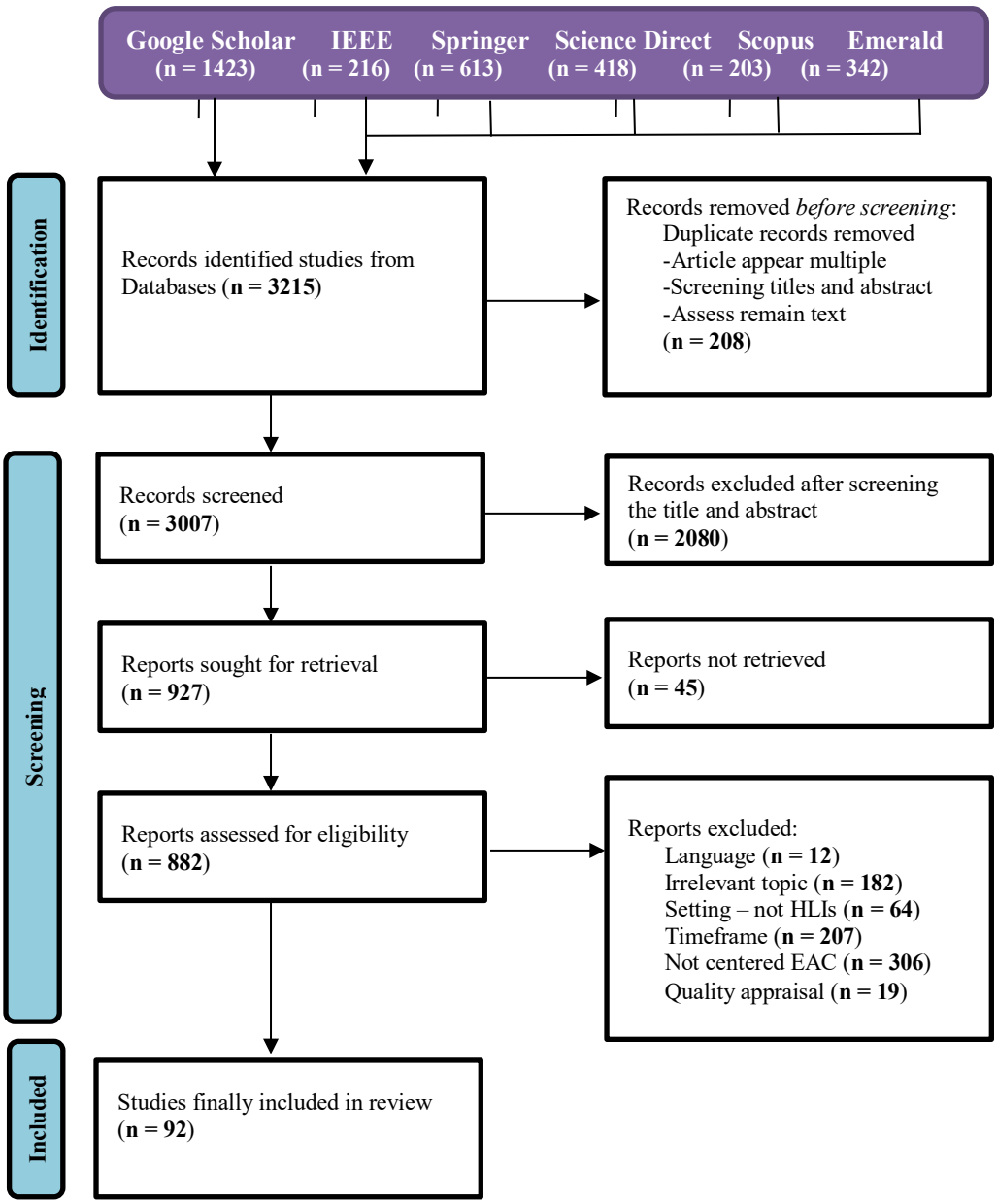

Figure 1
Flow diagram of the selection process for including articles
Source: Author's Construct; Page et al., (2021)

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IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Countries have contributed to LMS studies within EAC

The 92 articles were selected across all countries within EAC region as shown in figure 1. Kenya had 28 studies, being the highest number of articles, representing 30.4% out of the total number of 92 articles. This was followed by Uganda with 20 studies and Tanzania with 19 studies. 11 studies were conducted in Rwanda, followed by Somalia and South Sudan with 6 studies each. While Burundi and Congo had 1 studies each.

Table 1

Countries have contributed to LMS studies within EAC

Country	Number of studies	Percentage (%)
Burundi	01	01.1
Congo	01	01.1
Kenya	28	30.4
Rwanda	11	12.0
Somalia	06	06.5
South Sudan	06	06.5
Tanzania	19	20.7
Uganda	20	21.7
Total	**92**	**100.0**

Source: Author's Construct

4.1.2 Models have been used to study LMS adoption and use in EAC

In respect to research question number two, this part examine various model used in acceptance and usage of LMS in EAC as shown in figure number 2. The findings indicate that 14 (15.2%) articles were adopted TAM as the model that fit for their studies. The second model of preference was the UTAUT, being used in 11 (12.0%) studies. Then followed by Delone and Mclean's with 4 studies and TOE had 3 studies. While TPB model was used with 2 studies. SLT, GT, OOFAT, TOC, TRA, PBL, and TPACK models had only one studies adopt in each. 51 out of the 92 studies representing 55.4% did not use any model for their studies.

Table 2

Models adopted to study the use of LMS in EAC

Models	Number of studies	Percentage (%)
TAM	14	15.2
UTAUT	11	12.0
SLT	01	01.1
GT	01	01.1
Delone and Mclean's	04	04.3
NONE	51	55.4
OOFAT	01	01.1
TPB	02	02.2
TOC	01	01.1
TOE	03	03.3
TRA	01	01.1
PBL	01	01.1
TPACK	01	01.1
Total	**92**	**100.0**

Source: Author's Construct

4.1.3 Research methodologies have been employed to study LMS usage in EAC

The research methodology used in various EAC studies to investigate LMS usage is demonstrated in table 3. The findings indicate that 46 (50%) of the total studies used a quantitative approach, while 30 (32.6%) studies used a mixed methodology. The qualitative approach has fewer studies, which is 16 (17.4%) out of 92 studies reviewed. These findings highlight a significant favorite for quantitative methods in evaluating LMS usage, suggesting that researchers may favor measurable data to draw conclusions.

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Table 3
Research methodology employed to study LMS usage in EAC.

Methodology	Number of studies	Percentage (%)
qualitative	16	17.4
quantitative	46	50.0
Mixed	30	32.6
Total	**92**	**100.0**

Source: Author's Construct

The students appear most in the various studies as main subjects, as indicated in table 4. The findings indicate that 41 (44.5%) of the total studies used students as the main subject, while 26 (28.3%) studies used a mix of students, lecturers, and administrators. The lecturer has a total of 23 (26%), while 2 (2.2%) out of 92 studies have used administrative subjects. These results highlight the predominant focus on students in educational research, suggesting that their perspectives and experiences are deemed crucial for understanding the factors influencing learning environments.

Table 4
Subjects employed to study LMS usage in EAC.

Methodology	Number of studies	Percentage (%)
Students	41	44.5
Lectures	23	25.0
Administration	02	02.2
Mixed	26	28.3
Total	**92**	**100.0**

Source: Author's Construct

On the other hand, questionnaires were the most adopted instruments, as shown in table 5. The findings indicate that 53 (57.6%) of the total studies used questionnaires as the main instruments, while 29 (31.6%) studies used a mix of instruments. Four studies (4.3%) used interviews, four studies (4.3%) used desktop reviews, one study (1.1%) used observation, and one study (1.1%) used focus discussion groups. Moreover, the dependence on questionnaires may reflect a preference for quantitative data collection methods in the field.

Table 5
Instruments adapted to study LMS usage in EAC.

Instruments	Number of studies	Percentage (%)
questionnaires	53	57.6
Mixed	29	31.6
interviewees	04	04.3
desktop review	04	04.3
Observation	01	01.1
focus discussion groups	01	01.1
Total	**92**	**100.0**

Source: Author's Construct

The most preferred analysis tool used was descriptive analysis, as shown in table 6. The findings indicate that 62 (67.4%) of the total studies used a descriptive statistics approach, while 22 (23.9%) studies used a mixed approach. The thematic analysis has fewer studies, which are 8 (8.7%) out of 92 reviewed. These findings highlight a significant preference for descriptive analysis in evaluating LMS usage across EAC higher learning institutions, suggesting that researchers may favor measurable data to draw conclusions.

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Table 6

Analysis tools used in the study of LMS usage in EAC

Years	Number of studies	Percentage (%)
Thematic analysis	08	08.7
Descriptive statistics	62	67.4
Mixed	22	23.9
Total	**92**	**100.0**

Source: Author's Construct

Furthermore, table 7 shows that more articles focused on the year 2020 compared to other years. The findings show that 19 (20.7%) studies were conducted in 2020, followed by 15 (16.3%) studies in 2022 and 12 (13.0%) studies in 2024. In 2016, 9 (9.8%) studies were conducted, and 2023 has 9 (9.8%) studies. Eight (8.7%) studies were conducted in 2021, while 2025 has six (6.5) studies. In 2017 conducted 5 (5.4) studies, in 2019 conducted 3 (3.3) studies, while in 2018 have two (2.2%) studies.

Table 7

Years of LMS usage publications in EAC

Years	Number of studies	Percentage (%)
2015	04	04.3
2016	09	09.8
2017	05	05.4
2018	02	02.2
2019	03	03.3
2020	19	20.7
2021	08	08.7
2022	15	16.3
2023	09	09.8
2024	12	13.0
2025	06	06.5
Total	**92**	**100.0**

Source: Author's Construct

4.1.4 Critical Factors Influencing the Use of LMS in EAC

In the respect of research question number four of this study, the researchers collected a list of the various critical factors across the reviewed studies as LMS usage catalyst. The findings of these studies show that, 39 factors were identified. Among these, 10 factors appear most frequently: Training, Internet connectivity and bandwidth cost, ICT infrastructure, Institutional policies, Technical skills support, Perceived Ease of Use, Perceived Usefulness, Facilitating Conditions, Institutional support, and Attitude. With the reference to the statistics in Figure 2, there is an indication that regular training, internet related issues and bandwidth cost, ICT infrastructure are the lead factors for the success of LMS usage across EAC region.

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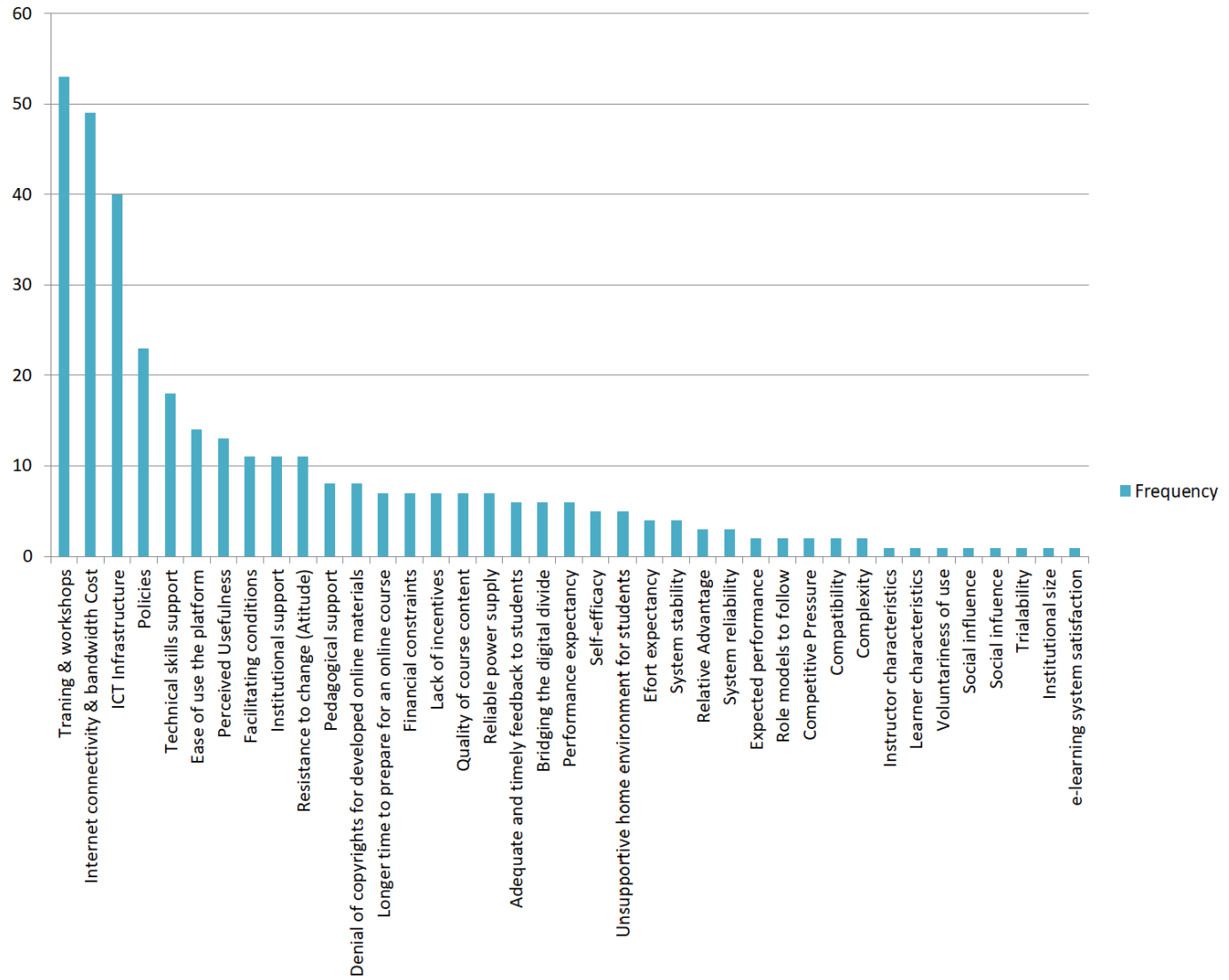

Figure 2
Critical factors influencing the use of LMS in EAC

Source: Author's Construct

4.2 Discussion

This review synthesized 92 studies on LMS usage across the EAC and shows research output is unevenly distributed, theoretically concentrated around a small set of acceptance models, and empirically dominated by student-focused, questionnaire-based quantitative designs. Table 1 indicates that Kenya (30.4%), Uganda (21.7%), and Tanzania (20.7%) account for most studies, with scant evidence from Burundi and Congo (1.1% each). This distribution is consistent with continent-wide implementation imbalances reported elsewhere and with differential research capacity across Sub-Saharan systems (van der Merwe et al., 2023; Mare et al., 2023). The publication peak in 2020 (Table 7) plausibly reflects pandemic-driven shifts to emergency remote teaching, a pattern also noted in period syntheses (Almaiah et al., 2020), although our corpus shows that usage constraints persisted beyond that period.

Theoretically, TAM and UTAUT dominate the EAC literature. Their parsimony and proven ability to explain intention and usage via perceived usefulness/ease of use and facilitating conditions makes them natural choices and is consistent with acceptance-model reviews (Mousa et al., 2020; Gamage et al., 2022). However, 55.4% of studies here were theoretical, which diverges from Mousa et al. (2020) who report wider use of formal models, limiting construct comparability and cumulative knowledge building in this region. Smaller clusters used DeLone & McLean and TOE, foregrounding system quality, service quality, and organizational readiness dimensions that TAM/UTAUT capture only

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indirectly suggesting a need to integrate micro-level acceptance with meso-level institutional enablers to better explain actual LMS use in EAC HLIs.

Methodologically, half of the studies used quantitative designs, a third used mixed methods, and fewer than one in five were qualitative. Students were the predominant participants, and questionnaires the most common instrument; descriptive statistics were used more often than inferential or mixed analyses. This profile suggests that much of the regional evidence characterizes perceptions and intentions rather than evaluating real-world usage behaviors and learning outcomes through experimental or longitudinal designs. The reliance on student samples also risks under-representing lecturer and administrator perspectives that are crucial to course design, policy enforcement, and support provisioning (Sinclair & Aho, 2018). In line with continental reviews (e.g., van der Merwe et al., 2023), the field would benefit from more robust designs (e.g., longitudinal cohorts, quasi-experiments, and implementation evaluations) that connect platform analytics with pedagogy and performance.

Across 39 determinants, ten factors recur with greatest frequency: training; internet connectivity, bandwidth cost; ICT infrastructure; institutional policies; technical skills support; perceived ease of use; perceived usefulness; facilitating conditions; institutional support; and attitude, refer to figure 3. The prominence of training, connectivity/cost, and infrastructure indicates that usage constraints in EAC are structurally mediated, not merely attitudinal, consistent with reports that adoption falters where reliability and service quality are weak (UNICEF, 2021; van der Merwe et al., 2023). At the same time, frequent reporting of TAM/UTAUT constructs (Table 2) confirms that well-designed professional development and supportive environments shape beliefs and capabilities that translate into active use (Araka et al., 2021; Gamede et al., 2021). Notably, privacy/security, foregrounded during COVID-19 (Almaiah et al., 2020), do not appear among the most frequent determinants here, suggesting a different prioritization in EAC higher education.

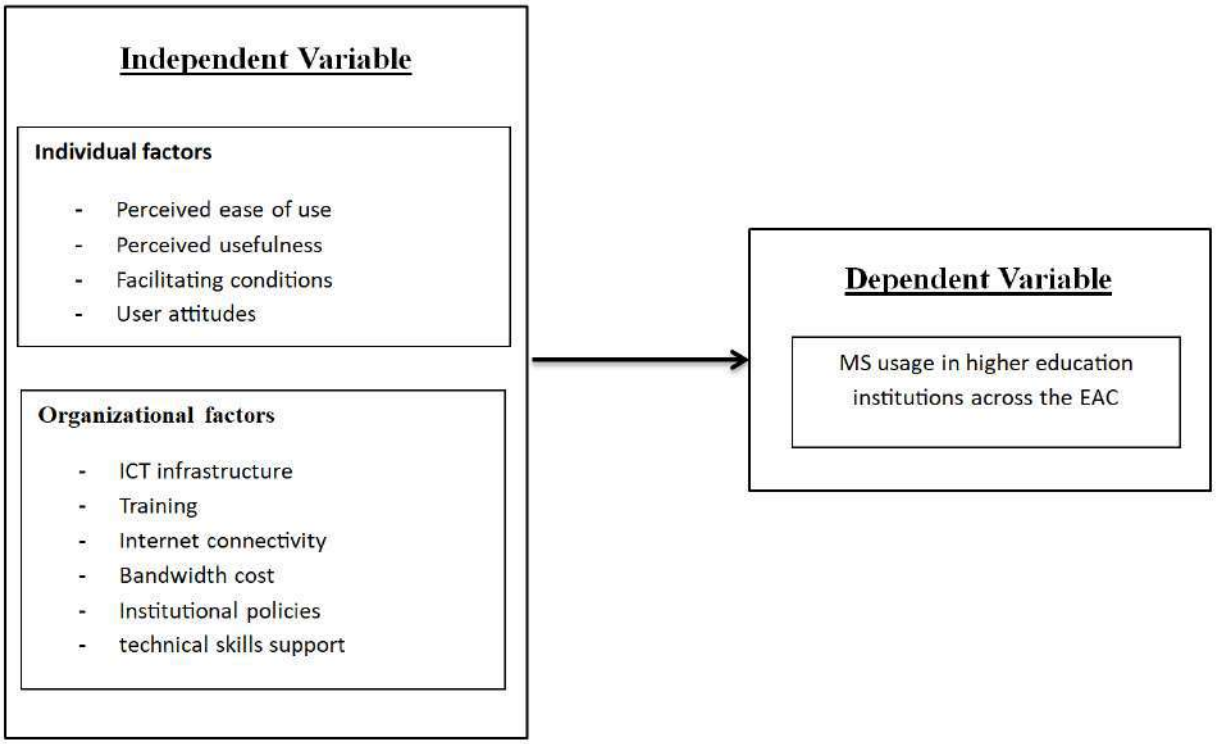

Figure 2

Ten critical factors influencing the use of LMS across EAC that recur with the greatest frequency

Source: Author's Construct

Taken together, these findings suggest three mechanisms for improving LMS usage in EAC HLIs. First, capability building: recurring, role-specific training that goes beyond platform navigation to pedagogy-in-practice (assessment design, feedback workflows, analytics-informed adjustments) strengthens self-efficacy and perceived usefulness, consistent with instructor-focused evidence on practice change (Mtebe, 2020; Sinclair & Aho, 2018). Second, structural enablement: financing for campus networks, Wi-Fi density, and off-campus bandwidth subsidies lowers participation costs and boosts reliability, conditions repeatedly tied to sustained use during and beyond COVID-19 (Almaiah et al., 2020; UNICEF, 2021). Third, institutionalizations: clear policies (e.g., course-level minimum LMS standards), helpdesk service levels, and recognition of digital course design embed LMS use into routine academic

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practice, rather than leaving it optional; this is consistent with settings that documented durable LMS uptake beyond emergency use (Gamede et al., 2021).

This review also surfaces important gaps. Nearly 55% of studies did not state a guiding model, weakening construct comparability and impeding meta-analytic synthesis (Mousa et al., 2020). Lecturer-centric barriers, such as time, incentives, and instructional design support, appear less frequently than student-side factors, even though lecturers' course-level decisions ultimately drive LMS-based learning opportunities (Sinclair & Aho, 2018). Moreover, mobile-first realities were often acknowledged but less frequently operationalized, despite strong indications that smartphone-based access is pivotal to equitable participation (UNESCO, 2023). Finally, there was limited reporting on equity dimensions (e.g., rural/urban, gender, disability), which are central to SDG 4 and to system-level improvement (UNESCO, 2021b).

These patterns have practical implications for EAC higher education systems. Institutions should prioritize structured, continuous professional development that links LMS features to pedagogy and assessment; mobile-optimized course design to reflect dominant student access modes; and formal policy levers (course minimums, syllabus checklists, and programme-level monitoring) that normalize LMS integration. Sector-level actions include pooled procurement to reduce bandwidth costs, national Ed-tech standards, and incentive frameworks that recognize digital teaching effort in promotion criteria. Importantly, support units (e-learning centers) should be resourced to provide just-in-time technical and pedagogical support, as technical scaffolding repeatedly appears as a precondition for usage. These recommendations are consistent with regional and global guidance on building resilient digital learning ecosystems (UNESCO, 2021a; UNICEF, 2021).

Strengths of this review include the application of PRISMA methods, coverage of eight EAC countries, and a decade-long window that captures both pre- and post-pandemic dynamics. Nonetheless, limitations must be acknowledged. We restricted inclusion to English-language publications and higher learning institutions, which may omit relevant francophone or non-tertiary evidence. Database selection and retrieval constraints can introduce publication bias, and 45 records could not be retrieved. The heterogeneity of measures and outcomes precluded meta-analysis; most included studies used descriptive methods and self-report instruments, limiting causal inference. Finally, the uneven country representation means that regional generalizations should be interpreted cautiously, especially for under-represented contexts such as Burundi and Congo.

Looking ahead, research should extend beyond intention and satisfaction toward actual usage and learning outcomes, leveraging LMS analytics and triangulating with classroom observations and assessment data. There is also a need for lecturer- and administrator-focused studies, equity-aware analyses (rurality, gender, disability), and design experiments that test how training, policy nudges, and connectivity improvements jointly affect usage. Multi-theoretical models that integrate acceptance, institutional readiness, and system quality can offer a more complete explanation of LMS use in EAC HLIs (e.g., TAM/UTAUT + TOE + DeLone & McLean) (Mousa et al., 2020; Gamage et al., 2022).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This systematic review of 92 studies across the EAC finds that LMS usage is driven by a combination of capabilities (training and skills), structures (affordable, reliable connectivity and ICT infrastructure), and institutionalization (policies, facilitating conditions, and support), alongside classic acceptance constructs (perceived usefulness, ease of use, attitude). Evidence production remains student-centered and largely descriptive, with TAM dominant. Furthermore the review shows that LMS adoption in EAC higher learning institutions is evidently but the usage is still a challenging problem.

5.2 Recommendations

To move from ad-hoc adoption to sustained, effective use, EAC higher learning institutions should (i) implement continuous, pedagogy-focused professional development; (ii) invest in mobile-first course design and robust, affordable connectivity; and (iii) formalize LMS expectations and support through policy and resourcing. Future work should employ stronger designs, incorporate lecturer and administrator perspectives, and integrate multi-level theories to link usage with learning outcomes. Together, these steps can help EAC higher learning institutions translate LMS investments into equitable, high-quality learning that advances sustainable development goal number 4 (SDG 4).

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REFERENCES

Abbad, M. M. M. (2021). Using the UTAUT model to understand students' usage of e-learning systems in developing countries. *International Journal of Artificial Intelligence in Education, 26*(6), 7205–7224. https://doi.org/10.1007/s10639-021-10573-5

Abdurrahman, A., Gustomo, A., & Prasetio, E. A. (2024). Impact of dynamic capabilities on digital transformation and innovation to improve banking performance: A TOE framework study. *Journal of Open Innovation: Technology, Market, and Complexity, 10*, 2199–2218.

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the e-learning system usage during COVID-19 pandemic. *Education and Information Technologies, 25*, 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

Al-Nuaimi, M. N., & Al-Emran, M. (2021). Learning management systems and technology acceptance models: A systematic review. *Education and Information Technologies, 26*, 5499–5533. https://doi.org/10.1007/s10639-021-10513-3

Alsswey, A., Al-Samarraie, H., El-Qirem, F. A., & Zaqout, F. (2020). M-learning technology in Arab Gulf countries: A systematic review of progress and recommendations. *Education and Information Technologies, 25*(4), 2919–2931. https://doi.org/10.1007/s10639-019-10097-z

Araka, E., Maina, E., Gitonga, R., Oboko, R., & Kihoro, J. (2021). University students' perception on the usefulness of learning management system features in promoting self-regulated learning in online learning. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT), 17*(1), 45–64.

Ates, H., & Polat, M. (2025). Exploring adoption of humanoid robots in education: UTAUT-2 and TOE models for science teachers. *Education and Information Technologies, 30*(9). https://doi.org/10.1007/s10639-025-13344-8

Bartlett, G., Boardman, F., Nha, Q., Pluye, P., Sergi, F., Cargo, M., Dagenais, P., Gagnon, M., Griffiths, F., Nicolau, B., Cathain, A. O., Rousseau, M., & Vedel, I. (2019). Improving the content validity of the mixed methods appraisal tool: A modified e-Delphi study. *Journal of Clinical Epidemiology, 111*, 49–59.e1. https://doi.org/10.1016/j.jclinepi.2019.03.008

Bouteraa, M. (2024). Mixed-methods approach to investigating the diffusion of FinTech services: Enriching the applicability of TOE and UTAUT models. *Journal of Islamic Marketing, 15*(8), 2036–2068. https://doi.org/10.1108/JIMA-12-2022-0343

Duruhan, S. A. A.-K. (2020). Probleme dayalı sanal öğrenme: Kavramsal bir çözümleme. *Turkish Studies-Information Technologies and Applied Sciences, 15*(2), 157–182. https://doi.org/10.29228/turkishstudies.43251

Endres, M. L., & Chowdhury, S. (2019). Team and individual interactions with reciprocity in individual knowledge sharing (pp. 123–145). IGI Global. https://doi.org/10.4018/978-1-5225-5427-1.ch007

Gamage, S. H. P. W., Ayres, J. R., & Behrend, M. B. (2022). A systematic review on trends in using Moodle for teaching and learning. *International Journal of STEM Education, 9*(1), 9. https://doi.org/10.1186/s40594-021-00323-x

Gamede, B. T., Ajani, O. A., & Afolabi, O. S. (2021). Exploring the adoption and usage of learning management system as alternative for curriculum delivery in South African higher education institutions during Covid-19 lockdown. *International Journal of Higher Education, 11*(1), 71. https://doi.org/10.5430/ijhe.v11n1p71

Gürcan, F., & Özyurt, Ö. (2020). E-öğrenme araştırmalarındaki temel eğilimler ve bilgi alanları: 2008-2018 yılları arasında yayımlanan makalelerle konu modelleme analizi. *Journal of Computer and Education Research, 8*(16), 738–756. https://doi.org/10.18009/jcer.769349

HEET. (2021). Higher Education for Economic Transformation Project. MoEST.

Innocent, W. A. (2020). Applicability of e-learning in higher learning institutions in Tanzania. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT), 16*(2), 242–249.

Khetsiwe Eunice, M.-K., & Cosmas, M. (2020). An analysis of factors affecting utilisation of Moodle learning management system by open and distance learning students at the University of Eswatini. *American Journal of Social Sciences and Humanities, 5*(1), 17–32. https://doi.org/10.20448/801.51.17.32

Lytras, M. D., Serban, A. C., Jesus, M., Ruiz, T., Ntanos, S., & Sarirete, A. (2022). Translating knowledge into innovation capability: An exploratory study investigating the perceptions on distance learning in higher education during the COVID-19 pandemic—the case of Mexico. *Journal of Innovation & Knowledge, 7*(4), 100258. https://doi.org/10.1016/j.jik.2022.100258

Maluleke, A., & Maake, G. (2025). Examining the impact of learning management systems in African higher education: A systematic review. *African Journal of Inter/Multidisciplinary Studies, 7*(1), 1–15. https://doi.org/10.51415/ajims.v7i1.1550

Licensed Under Creative Commons Attribution (CC BY-NC)

Mare, A., Woyo, E., & Amadhila, E. M. (2023). Teaching and learning with digital technologies in higher education institutions in Africa. In K. J. Kennedy, E. H., & L. G. Joseph Divala, J. Perumal (Eds.), *Routledge*. https://doi.org/10.4324/9781003264026

Mousa, A. H., Aljshamee, M., Mohammed, A. H., Mousa, S. H., & Obaid, H. A. (2020). A systematic literature review: Measuring user acceptance models in e-learning adopted in higher education institutes. *AIP Conference Proceedings, 2290*(1), 409–430. https://doi.org/10.1063/5.0027409

Mtani, H., & Mbelwa, J. (2022). Factors affecting learning management systems usage in higher learning institutions in Tanzania: A case of University of Dodoma. *International Journal of Education and Development Using Information and Communication Technology (IJEDICT), 18*(1), 7–26.

Mtebe, J. S. (2020). Examining e-learning system self-efficacy amongst instructors at the University of Dodoma, Tanzania. *Open Praxis, 12*(3), 343–357. https://doi.org/10.5944/openpraxis.12.3.1103

Mtebe, J. S., & Raphael, C. (2018). Key factors in learners' satisfaction with the e-learning system at the University of Dar es Salaam, Tanzania. *Australasian Journal of Educational Technology, 34*(4), 107–122.

NACTVET. (2024, May 13). NACTVET - Students Admission. MoEST. https://nactvet.go.tz/page/students-admission

Ndibalema, P. (2025). Perspectives on the use of learning management systems in higher learning institutions in Tanzania: The gaps and opportunities. *Social Sciences and Humanities Open, 11*, 1–10. https://doi.org/10.1016/j.ssaho.2025.101463

Ngala, O. M. (2024). Strategies for enhancing acceptance of new technologies by open, distance, and eLearning centers in Kenya. *Teacher Education through Flexible Learning in Africa (TETFLE), 6*, 15–37. https://doi.org/10.35293/tetfle.v6i1.4687

Nkata, A. (2020). Strengthening of an effective e-learning management system in Tanzanian higher learning institutions. *Acta Scientific Computer Sciences, 2*(11), 3–4. https://www.researchgate.net/publication/345250461

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., … Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ (Clinical research ed.)*, *372*, n71. https://doi.org/10.1136/bmj.n71

Sinclair, J., & Aho, A. M. (2018). Experts on super innovators: Understanding staff adoption of learning management systems. *Higher Education Research and Development, 37*(1), 158–172. https://doi.org/10.1080/07294360.2017.1342609

Tan, K. S. T., & Lee, A. S. H. (2024). Key determinants of blockchain adoption: A unified framework integrating UTAUT and TOE models. *ICBTA*, 60–65.

Tornatzky, L., & Fleischer, M. (1990). *The process of technology innovation*. Lexington Books. https://archive.org/details/processesoftechn0000torn

UNESCO. (2021a). The digital learning turn in Africa: The role of local ecosystems. ED/GEC/2021/03. https://unesdoc.unesco.org/ark:/48223/pf0000377725?posInSet=1&queryId=18b1f9bd-1b10-4893-a941-86032e55a728

UNESCO. (2021b). Transforming our world: The 2030 agenda for sustainable development. UNESCO.

UNESCO. (2023, February 2). Best practices in mobile learning. UNESCO.

UNICEF. (2021). Transforming education in Africa: An evidence-based overview and recommendations for long-term improvements. *UNICEF*. https://www.unicef.org/media/106686/file/Transforming Education in Africa.pdf

van der Merwe, T. M. D., Serote, M., & Maloma, M. (2023). A systematic review of the challenges of e-learning implementation in Sub-Saharan African countries: 2016–2022. *Electronic Journal of E-Learning, 21*(5), 413–429. https://doi.org/10.34190/ejel.21.5.3075

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *Management Information Systems Research Center*, 426–478. https://doi.org/10.2307/30036540

Vincent, M. V., Cyprian, R. M., & Musau, F. (2020). A usability evaluation framework for web-based learning management systems used in Kenyan universities. *7*(3), 46–52.

Yunus, H. (2021). Online learning management system (OLMS) in Indonesian higher education: Investigating benefits and obstacles. *Parahikma Journal of Education and Integrated Sciences, 1*(1), 1–8.

Ziraba, A., Godwill, A. C., Nkea, A. nee A. M., & Lwanga, S. C. (2020). The adoption and use of Moodle learning management system in higher institutions of learning: A systematic literature review. *American Journal of Online and Distance Learning, 2*(1). www.ajpojournals.org

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A phenomenological investigation of how junior secondary school teachers in Trans-Nzoia County support learner self-reliance through the competency-based curriculum (CBC) in Kenya

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ABSTRACT

This study examines how teachers in junior secondary schools in Trans-Nzoia County, Kenya, promote learner self-reliance within the Competency-Based Curriculum (CBC). The study is informed by the critical pedagogy proposed by Paulo Freire, which emphasizes the importance of dialogue, reflection, and action as essential aspects of education that help build independence among learners. This research employs a hermeneutic phenomenological research design, targeting junior secondary school teachers in public schools of Trans-Nzoia County. To gain a rich account of the experiences of five teachers, these teachers were purposively selected to participate in in-depth, unstructured interviews. Braun and Clarke's 6-step thematic analysis was covered in the data analysis. It included familiarization with data coding, identifying themes, reviewing and naming themes, and interpreting the results. Important data can be observed, especially that teachers have encountered significant changes, such as large class sizes, resource shortages, and inadequate training. However, most of them have found a coping mechanism in the form of project-based learning, peer teaching, and utilizing community resources to foster autonomy among their students. Research shows that self-reliance in the CBC framework means constant support of teachers, institutional commitment, and the enthusiastic participation of the community. Suggestions provided include specific teacher training and a lower student-to-teacher ratio, as well as increased collaboration among schools, parents, and local communities to help develop self-reliant learners.

Keywords: Autonomy, Competency-Based Curriculum, Critical Pedagogy, Education Reform, Phenomenology, Trans-Nzoia County, Teacher Training

I. INTRODUCTION

The Competency-Based Curriculum (CBC) in Kenya represents a significant shift in the country's curriculum, aiming to equip students with the skills necessary to succeed in the 21st century. At the heart of this reform is the concept of self-reliance, which enables learners to make decisions, solve problems, and take action independently. Self-reliance is not merely one of the fundamental goals of the CBC but a core competency that is supposed to be fostered in all subjects and activities (Kenya Institute of Curriculum Development. [KICD], 2017). This transformation rejects the old method of passing on knowledge, instead adopting a new approach that involves teaching students through a learning process, rather than simply imparting knowledge. According to the CBC framework, self-reliance is viewed as a vital life skill that students must develop to ensure they achieve academic success and personal growth. The task of teachers in junior secondary schools has now become to create learning experiences that foster independence, critical thinking, and problem-solving. This change in teaching mode requires teachers to employ emerging, student-centred methods, meaning that students now assume a greater role in managing their education with minimal input (Ngatia et al., 2021). Despite this obvious policy trend, there has been little research into the practical application of these changes and the extent to which teacher independence is taught in classrooms.

Teachers in Trans-Nzoia County, like those in most other parts of Kenya, face numerous obstacles in implementing the principles of CBC. Such obstacles include large classes, under-resourcing, and the overemphasis on summative tests that do not accurately reflect the curriculum's features. Additionally, there are cultural norms of discipline and classroom power that may not align with the CBC model, which emphasizes discussion-based and learner-centered education. The demands raised by the CBC and what is synonymous with reality in the classrooms of many teachers do not quite align, according to many teachers (Ngeno, 2023). Moreover, self-reliance as a successful concept in the CBC cannot be attributed solely to educational reforms, but rather is viewed in the broader context of social and cultural factors as well. The path a learner chooses for their education depends on various factors, including family support, community heritage, and socioeconomic status (Emmy & Thinguri, 2025). To be self-sustaining, teachers

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require adequate pedagogical skills and knowledge, as well as cultural understanding that will connect with the experiences of their students. The study will focus on how the teachers of Trans-Nzoia County junior secondary schools manage them and help foster self-reliance within the CBC context. This research will examine the methods teachers use, the challenges they face, and how they adapt the curriculum to suit their students, based on interviews with the researched teachers. The results will contribute to the current debate on the actual practice of CBC in Kenya and provide informative suggestions to educators, policymakers, and curriculum designers on how to further facilitate self-reliant learners in the Kenyan environment.

1.1 Statement of the Problem

The implementation of the Competency-Based Curriculum (CBC) in Kenya marks a significant shift in educational philosophy, where the focus in education has shifted towards learner-centred teaching and skills development, emphasizing self-reliance, critical thinking, and problem-solving. CBC focuses on producing self-reliant learners, although there is a lack of knowledge on the effective degree to which this goal is being achieved in reality, especially in rural counties and deprived environments, as in the case of Trans-Nzoia County. Although the directives recommend it, teachers still find it very difficult to make students self-reliant due to reasons such as large class sizes, a lack of resources, and cultural norms of discipline and power. In Trans-Nzoia County, teachers face the challenge of balancing the learner-centred focus of the CBC with the long-standing, exam-oriented education system, which remains the prevailing mode in many schools. Furthermore, there is a lack of proper teacher training and support, which makes implementing self-reliance strategies in the classroom a challenging situation. The challenges do not allow CBC to fully achieve its goals, and they restrict the development of self-reliant learners. It is thus vital to determine how educators in this part of the country are coping with these issues, as well as how educators are redesigning their teaching to promote learner agency as dictated by the goals of CBC.

1.2 Research Objective

To examine ways in which junior secondary teachers in Trans-Nzoia County can assist in building self-reliance among learners with the Competency-Based Curriculum (CBC).

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is theoretically justified within the context of Paulo Freire's critical pedagogy, which provides a basis for viewing the aspect of making learners self-reliant through teacher guidance. Pedagogy, according to Freire, as developed in his masterpiece Pedagogy of the Oppressed, suggests that teaching and learning should proceed through dialogue and mutual recognition between teachers and students. Freire asserted that learning is not a mechanical process of transmitting knowledge from the teacher to the learner, but rather viewed it as an interactive process in which students play an active role in constructing their knowledge. This idea of conscientization, which involves assisting learners to understand and respond to the social, political, and economic forces that dominate their lives, aligns well with the visions of the CBC, with an articulate focus on critical thinking development, problem-solving, and self-reliance as key competencies (Freire, 1970). On his theory, Freire emphasises the transformation of teachers being the only voice in the classroom to learning facilitators. It demands that teachers cede the role of power and allow learners to be the centre of control, assuming responsibility for their learning through cooperative groups, personal reflection, and problem-solving. The focus on learner-centred instruction aligns with the CBC's emphasis on fostering self-reliance, as educators have the responsibility of creating conditions where learners can take charge of their educational processes, requiring minimal or no intervention. Teachers should formulate learning activities that promote independence, critical thinking, decision-making, and ownership of tasks and relationships with others (Freire, 1970). Moreover, the thoughts presented by Freire, especially, apply in a Kenyan setting where teacher-learner relationships have always been an upheaval. In this environment, teachers need to adopt a new way of thinking, one that prioritizes student voice and cooperation as the most valuable strategies, rather than relying on authority and a top-down approach. Through the incorporation of Freire's critical pedagogy, this research paper has recognized that teachers should play a dual role, advising and enabling students to become independent citizens who can operate effectively in complex societal settings (Shor, 1992). In summary, the Freirean pedagogical theoretical framework offers a powerful conceptualization of how to view the role of teachers in catalyzing self-reliance, as envisaged in the CBC system.

2.2 Empirical Review

The empirical review will examine the current body of research on the Competency-Based Curriculum (CBC) in Kenya, particularly those issues related to developing self-reliant learners. The primary objective of CBC, introduced in Kenya, is to produce not only academically competent individuals but also learners who can think critically and solve their problems independently (KICD, 2017). Nevertheless, several surveys have indicated that teachers are finding it

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very hard to introduce this fully, especially in resource-starved areas such as Trans-Nzoia County. The shortage of sufficient resources in most schools is one of the major issues with the adoption of CBC. The aspect of rural teachers is associated with crowded classrooms, a lack of teaching resources, and inadequate teacher training, all of which significantly hinder their ability to establish student-centered classrooms (Ngeno, 2023). The emphasis on traditional or archaic forms of teaching, such as rote learning or passive learning, is contradictory to the CBC approach of active learning and participatory learning. According to researchers (Isaboke et al., 2021; Cheruiyot, 2024), although teachers are broadly supportive of the CBC goals, a large number of them express frustration with their readiness to deliver it due to limited resources and opportunities to prepare professionally. Such disparity in teacher training creates incoherence in the utilization of CBC principles, especially in the aspect of instilling self-reliance among learners. In addition to the resource issues, research has also highlighted the conflict between the expectations of the CBC and the customary cultural requirements of education in Kenya. As an illustration, a hierarchical system of classrooms has long been observed in Kenyan classrooms, whereby teachers are regarded as the supreme authority, and students are expected to take notes and comply with directions without questioning. This conventional method contrasts directly with the learner-centered approach that the CBC uses, where learners are encouraged to invest effort into the study process and become its owners (Kagoire et al., 2024). As noted by Bunduki (2017), such schools create conditions in which teachers are not always able to innovate and introduce new approaches, especially when the community regards passing exams and achieving good academic results as the primary goal, rather than promoting critical thinking and problem-solving abilities (Cheruiyot, 2024).

Despite these difficulties, various studies highlight the importance of institutional support and teacher autonomy in the successful implementation of CBC. Learner-centered practices are more likely to be introduced when a school offers teachers the possibility to engage in continuous professional development, mentorship, and collaboration (Muktar et al., 2022). It is rather self-explanatory that when teachers are continuously trained in student-centered approaches and when school leadership provides full support in implementing them, they are far more likely to incorporate these methods into their teaching practice. As an example, Kagoire et al. (2024) found that leaders with a culture of innovation in their schools were better able to cultivate environments that encouraged learner autonomy, as teachers felt free to test new approaches to teaching. Additionally, the community of parents and local leaders plays a vital role in supporting the development of self-reliant learners. Emmy and Thinguri (2024) emphasized that parents are more likely to appreciate independent learning at home when they understand and agree with the goals of the CBC. Community engagement plays a critical role in breaking down societal resistance, which often prioritizes exam achievement over comprehensive learning. Schools where parents discuss the benefits of self-reliance and engage in educational activities foster an environment that is conducive to achieving the CBC goals. Despite such identified barriers, the empirical literature highlights the flexibility of teachers who creatively respond to the challenges they encounter. Educators have also developed creative solutions to utilize local materials and community resources, and involve students in learning through hands-on activities, which aligns with the approach of the CBC, emphasizing practical, hands-on education (Kubai, 2023). For example, in Trans-Nzoia County, teachers have resorted to pedagogical resilience by utilizing locally available materials, such as clay and fibers, to educate in science and the arts due to resource constraints. These strategies not only make learning beneficial but also foster the development of self-reliant learners who can adapt to their environments (KICD, 2017).

III. METHODOLOGY

3.1 Research Design

The study employed a qualitative research design, adopting a hermeneutic phenomenological approach to understand the experiences and perceptions of junior secondary school teachers in Trans-Nzoia County, Kenya, regarding the implementation of self-reliance within the Competency-Based Curriculum (CBC). The phenomenological approach was selected because it facilitated a profound comprehension of how teachers could make meaning of their life worlds and how they understood the possibilities and created challenges associated with developing self-independence within the CBC framework. This study found the hermeneutic approach especially helpful because it allowed for exploring the personal reflection and practices of teachers within their social and cultural environments, where they work. The method aimed to gather in-depth explanations of the lives of teachers in a practical scenario.

3.2 Target Population

In this study, the target population consisted of junior high school educators in public schools in Trans-Nzoia County, Kenya. Trans-Nzoia County was selected due to its special circumstances and conditions, such as being under-resourced, compounded by large classes and rural infrastructure. The challenges presented by the county provided a perfect setting to analyze how the CBC principles, specifically those relevant to the question of self-reliance, are being implemented in a setting where traditional educational practices still prevail. The sample of teachers who participated

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in the study played a direct role in implementing the CBC. It was expected to teach using learner-centered teaching techniques, which aimed to develop autonomous, critical thinkers and problem-solving skills in students.

3.3 Sampling Method

The study employed a purposive sampling approach to select participants. This type of non-random sampling was relevant since it enabled the direct choice of participants who were directly involved in the study of the phenomenon, in this case, the implementation of self-reliance within the CBC framework. The purposive sample would select teachers who could provide detailed information and useful data to suit the research goals. It also enabled the researcher to concentrate on teachers who have had extensive experience and knowledge of the issues and strategies involved in enhancing self-reliance.

3.4 Sample Size and Justification

The study covered a total of five junior secondary school teachers in county-owned schools in Trans-Nzoia County. The group of five participants was chosen to balance the richness of the data and the ease of managing the group. A small sample size was considered suitable in qualitative research, as the researcher was able to facilitate in-depth, semi-structured interviews that provided thorough information on the teachers' experiences. Qualitative research is primarily focused on describing lived experiences, and researchers do not aim to generalize their findings to a vast population. The five teachers involved were suitable, insofar as they constituted a reasonable sample size that was diverse enough to provide relevant information within the study time and resource limits. Moreover, all the selected teachers were also experienced in teaching within the framework of the CBC, and they were able to offer valuable insights into the implementation process. Although the small statistical sample diminishes the extent to which the conclusions can be generalized, it enables a thorough understanding of the particular complexities associated with the profession of teaching in Trans-Nzoia County.

3.5 Data Collection Methods

Semi-structured, in-depth interviews were employed to gather data, providing flexibility in collecting details about the participants' experiences. Semi-structured interviews are primarily used in qualitative research, as they permit the researcher to investigate specific issues while also allowing participants to express themselves in their own words. Some of the main themes included in the interviews were: Teachers' understanding of self-reliance within the context of CBC. Tategies employed by teachers to promote self-reliance in students. Challenges faced by teachers in fostering self-reliance and how they adapt to these challenges. The role of institutional and community support in the successful implementation of CBC. Every interview lasted an average of 45 minutes to one hour, during which participants were given adequate time to share their story. They recorded the interviews using a recording device with the participants' consent and transcribed them verbatim, ensuring the accuracy and integrity of the data.

3.6 Data Analysis

Braun and Clarke (2006) employed a six-step thematic analysis process to analyze the data, a method accepted by qualitative researchers for identifying, analyzing, and interpreting patterns in the data as a rigorous and systematic process. The process began with familiarization with the data, where the researcher transcribed the audio records and carefully reviewed the transcripts to gain a general understanding of the data. This was then followed by initial coding, in which important sections of the data were coded according to their relevance to the research questions. During the step of searching for themes, the theme codes were combined into larger themes, which were based on the repetitive patterns in the data, particularly in areas such as self-reliance, teaching practices, and the problems that teachers encounter. The reviewing of themes step was conducted to ensure that the identified themes accurately reflected the data and corresponded to the research questions. There was also refinement and combining of themes where necessary. During the step of defining and naming the themes, the themes were clearly defined and named to indicate their essence and meaning. Lastly, during the report's writing, the findings were organized in line with the themes, and a narrative was developed to convey the analysis's outcome. The study's results were subsequently linked to the conceptual background and the literature to provide a comprehensive context for the findings.

3.7 Ethical Considerations

The study adhered to strict ethical guidelines to ensure the rights and wellbeing of the participants. The following ethical considerations were made: *Informed Consent:* Prior to participating in the study, each teacher was informed of the study's purpose, the voluntary nature of their participation, and that they would be at liberty to withdraw at any time without consequence. All the participants signed and are included in informed consent. *Confidentiality:* All personal details and interview data were treated as confidential to conceal the identities of the participants. The interviewees were assigned pseudonyms, and all identifying data were removed from the interview records. *Right to*

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Withdraw: Participants were given the right to withdraw from the study, which would exclude their data from the analysis in the event of withdrawal.

IV.FINDINGS & DISCUSSION

4.1 How Well Teachers Understand Self-Reliance

There was a commonality of meaning regarding self-reliance among the teachers in this study, with the majority adopting the view that self-reliance entailed the capacity of students to determine goals, resolve problems, and conduct their learning as independent individuals. This knowledge can be aligned with the goals of the Competency-Based Curriculum (CBC), which not only aims to produce learners who are academically knowledgeable but also able to flourish in various real-life situations. One teacher clearly articulated this notion:

> *Self-reliance entails the idea that students can take care of themselves and manage their learning. This is a quality that describes self-reliance. It is no longer in preparing them to take exams but preparing them to face the world that is ahead of them."*

This indicates that self-reliance is viewed as a vital life skill, rather than a scholarly competitive advantage. According to the teachers in the study, instilling independence in learners is crucial to ensure they can cope in a world characterized by high rates of unemployment, poverty, and social insecurity. One of the teachers remarked:

> "*In school, students need to be taught to be self-reliant not only but also in their lives. Their world is evolving at a rapid pace, and they must be able to think and act on their own in order to thrive."*

These results align with the opinion of Ngatia et al. (2021), who State that Competency-Based Curriculum is not only about academic results but also about preparing students to face the challenges life can offer them. According to them, CBC ought not only to develop cognitive abilities, but also emotional, social, and practical ones. Teachers emphasized that possessing these qualities is essential for becoming self-reliant, as they enable students to navigate challenging life events. However, simultaneously, there was a belief that self-reliance is an ideal to be pursued, but attaining self-reliance is not an easy task. Teachers emphasized that it was time to change the current system of education, which has always been rooted in rote learning and lecturing. Ngeno (2023) explain that the successful introduction of CBC requires teachers to shift away from being knowledge transfer agents to becoming facilitators of the learning process. Teachers in this study were very enthusiastic about assuming this new role, but identified several obstacles they faced. One of the teachers said:

> *"We know how crucial self-reliance is, but we cannot make it practical. We continue to be trapped in a system where students get rewarded to learn by rote rather than critically or problem-solving."*

This spirit is in sympathy with the conflict between the CBC's purpose and the systems set up in the education system. Teachers believed it was essential to teach students to think critically. However, they were nonetheless frustrated that the system itself pays more attention to exams and content-based tests, rather than building practical competencies. This conflict aligns with KICD (2017), which indicates that the education system needs to adapt to the principles of CBC. Teachers are drawn between traditional schooling, which posits that education is primarily academic, with the goal of success in tests, and the newer, more inclusive education promoted by the CBC.

4.2 Strategies to Help Learners become more Self-Reliant

Educators engaged their students through various techniques, the most commonly used being project-based learning, peer teaching, group work, and leadership assignments, as a way of instilling self-reliance among their learners. Such strategies align with the CBC's idea of providing student-centered learning, in other words, learning processes that enable students to take ownership of their learning. Educators observed that project-based learning enabled students to take ownership of their education, something the traditional system could not achieve. After a teacher explained:

> *"When I give group projects, I leave students to choose who will take what role in the group. This enables them to develop ownership of the task and acquire skills leading to leadership. They are taught how to work as a team, get organized, and learn to solve a problem collectively."*

Project-based learning is regarded as an effective means of fostering self-reliance, as it provides students with the incentive to participate in authentic activities that involve critical thinking, problem-solving, and collaboration. This method aligns with the principles of critical pedagogy, as defined by Freire (1970), who believed in and advocated for active and participatory education, as opposed to passive and prescriptive education. Teachers in this study pointed out that by empowering students with choices about their learning activities, they were not only enhancing self-reliance but also allowing students to develop important life skills that would sustain them even after leaving the learning facilities. Teachers also applied the concept of peer teaching to drive independence. There were regular calls for students to work in pairs or small groups, with more confident students helping their peers understand the concepts. One teacher noted:

> *"Peer teaching has worked very well in enabling students to become masters of their learning. It enables students to educate each other and gives them confidence. It also assists the students, who may be failing to understand other students, due to the relaxed atmosphere".*

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The approach is consistent with the studies conducted by Ngatia et al. (2021), who emphasize the necessity of collaboration and the significance of peer learning in promoting student autonomy. Teachers in this paper discovered that when students were empowered by being given leadership roles, either through planning group activities or assisting their peers, they gained a sense of responsibility and motivation for their learning. As one teacher shared:

> *"Giving leadership responsibilities, such as leading discussions or classroom tasks, will make the students more responsible and confident in general. This makes them experience some interest in their learning, and it comes about because they are motivated to perform a role in the classroom."*

Although these strategies proved effective, implementing them was not very smooth. The resources were also a significant determinant of how far these strategies could be implemented. Teachers in more-resourced schools could provide more experiential learning opportunities to schoolchildren (e.g., hands-on projects and activities), whereas teachers in under-resourced schools had to use a creative approach to make learning exciting with space-limited resources. One teacher shared:

> *"Our school lacks the resources that other schools have. So, we do what we can with what we have on hand, such as local materials in arts and science. We train pupils on how to utilize the surrounding environment to create learning tools. You cannot expect them to do it easily, but it allows them to relate it to their lives in learning."*

This demonstrates pedagogical resilience, as teachers respond to the problems they face by utilizing locally available resources, as confirmed by the work of Isaboke et al. (2021). These authors emphasize the need to adapt teaching practices to all available resources in efforts towards becoming self-reliant. In Trans-Nzoia County, the teachers demonstrated extraordinary resourcefulness in interacting with students and encouraging self-reliance by utilizing local resources.

4.3 Obstacles to Achieving Self-Reliance

The major obstacles to creating self-reliance that teachers identified included large class sizes, insufficient materials, inadequate funding, and an excessive focus on exams. A critical problem was the large classes, as the teachers were unable to spend time individually with each student, thereby weakening their ability to promote independent learning. One teacher explained:

> *"With a classroom of 60 students, one could not offer attention to all students in order to promote independence. Most students are dependent on teachers since they lack sufficient time to practice things on their own."*

This finding is consistent with Muktar et al. (2022), whose study revealed that the size of classes and the workload of teachers significantly contribute to the quality of learning in CBC settings. Teachers asserted that the curriculum allowed for independence to be achieved. However, there was a practical limitation to this independence due to the large number of students in the classroom environment. Only a few felt that gap in training; additionally, the teachers needed to be self-reliant and impart this aspect to the students. Early workshops on CBC were typically abstract and did not address the need for adapting teaching to the learner-centered approach required in CBC (Cheruiyot, 2024). One teacher remarked:

> *"We were trained on CBC, but the training was not adequate. We were informed about the goals; however, no specific instructions were provided on how to accomplish them in the classroom. We also make it up as we go on."*

This observation aligns with Ngeno (2023), who noted that Kenyan teachers tend to express a lack of preparation to implement CBC due to a lack of professional development. Inadequate and direct training did not help teachers gain a proper understanding of the process of making students self-reliant. In addition, parental role was a sword with two sides. Although the benefits of parental involvement are observed, some teachers noted that parents were so heavily involved in their children's academic work that this hindered their efforts to help them become self-sufficient. One teacher shared:

> *"The parents sometimes end up doing their children's homework or even slip in their work that their pupils did not complete. This will work against the self-sufficiency initiative."*

This illustrates how societal expectations influence education, as Emmy and Thinguri (2024) concluded that when parents prioritize exam performance over skill-building, including critical thinking and independence, it may negatively impact the aims of CBC.

4.4 Institutional and Community Support

Finally, institutional and neighborhood support were identified as crucial for effective CBC deployments and building self-reliance. Teachers in the schools with high leadership indicated that they felt more supported in their efforts to employ learner-centered strategies. One teacher noted:

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> *"It makes a massive difference when the headteacher helps things like mentorship and when the teachers are persuaded to experiment. The teachers are empowered and open to trying out new teaching mechanisms."*

This corresponds to the findings by Kagoire et al. (2024), who discovered that school leadership is a key factor in the effectiveness of CBC, as it fosters innovative conditions and teacher autonomy. Those teachers in schools where an active support mechanism was in place felt more confident in handling CBC and encouraging self-reliance. Additionally, community participation was perceived as vital in supporting the objectives of the CBC. Teachers who engaged parents with their children in a learning process found that it had enabled them to consolidate the relationship between the school and the home, which in turn facilitated the students' self-reliance. One teacher shared:

> *We hold regular parent meetings to discuss with them the benefits of being self-reliant. The more the parents are aware of the curriculum design, the higher the chances they show their children to practice independence at home."*

The given finding aligns with Kubai's (2023) work, which emphasizes the importance of parent and community engagement in supporting student learning, particularly in rural and under-resourced regions.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study aimed to explore how teachers in junior secondary schools in Trans-Nzoia County, Kenya, can foster learner self-reliance using the Competency-Based Curriculum (CBC). The results show that teachers tend to interpret self-reliance as the capability of students to be responsible for their learning, generate options, and resolve issues independently. This knowledge aligns with the goals of the CBC, where education encompasses not only the development of academic knowledge but also critical thinking, problem-solving, and independence. Nevertheless, teachers struggle to fully embrace the ideals of CBC fully, despite being committed to developing self-sufficiency in instruction. The effectiveness of CBC in ensuring the self-reliance of learners is hindered by factors such as overcrowded classrooms, limited facilities, and inadequate opportunities for professional development. There is also tension between the motives of the CBC and the current educational culture, stemming from societal expectations and historical educational practices that prioritize exams over skill development. However, the teachers within Trans-Nzoia County have been resilient and creative in adapting to the challenges. Strategies that they have employed to promote student autonomy include project-based learning, peer teaching, and offering leadership positions.

Additionally, the efforts of school leadership and community participation, particularly parental involvement, have played a crucial role in ensuring the successful implementation of self-reliance initiatives under the CBC. The study finds that although there has been an improvement in the implementation of the CBC in Trans-Nzoia County, there are still major impediments that must be overcome to ensure the achievement of the curriculum's goals. Students require a more supportive environment in schools and the wider community to develop self-reliance.

5.2 Recommendations

To successfully facilitate self-reliance in learners using the Competency-Based Curriculum (CBC) in Trans-Nzoia County, several critical recommendations must be addressed. First, teachers should be professionally prepared to maintain a high level of understanding of CBC; therefore, they should engage in ongoing professional development. Practical teacher education that connects theory with practice in the classroom is essential for teachers, as it should aim to promote independence among students. Additionally, downsizing classes should be encouraged, as small classes would make it easier to individualize attention, allowing teachers to find ways to assist their learners in becoming self-reliant. Schools should also receive sufficient resources, such as teaching materials and technology, to conduct practical learning, which is the highlight of CBC. Moreover, parental engagement is crucial in reinforcing the objectives of CBC. To match parents' focus on having their children develop skills, rather than just performing well academically, schools should play an active role in workshops and meetings with parents to reinforce their expectations. Effective school leadership is also essential, with supportive school leadership establishing an atmosphere where teachers find the confidence to innovate and adopt learner-centered approaches. Finally, the procedure for measuring self-reliance needs to be clarified, and specific instructions on how students can be rated according to their ability to think critically, make decisions, and solve problems should be provided. All of these recommendations are meant to establish more favorable conditions within which the CBC is likely to succeed in Trans-Nzoia County.

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REFERENCES

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Bunduki, K. H. (2017). Reimagining education for transformation and social change: A case study of integrated learning at UCBC in the DRC. *South African Journal of Higher Education*, *31*(1), 14-28.

Cheruiyot, B. (2024). Challenges Faced in the Implementation of Competency-Based Curriculum (CBC) in Junior Schools in Kenya East African *Journal of Education Studies, 7*(3), 260-266. https://doi.org/10.37284/eajes.7.3.2098

Emmy, W. A., & Thinguri, R. W. (2025). Influence of school-parental collaborative empowerment strategies on implementation of competency-based curriculum in public primary schools in Nyamache Sub-County, Kisii County, Kenya. *Journal of Research Innovation and Implications in Education, 9*(2), 1142–1152. Center for Research Implications & Practice.

Freire, P. (1970). *Pedagogy of the Oppressed*. New York: Herder and Herder.

Isaboke, H., Mweru, M., & Wambiri, G. (2021). Teacher preparedness and implementation of the Competency-Based Curriculum in public pre-primary schools in Nairobi City County, Kenya. *International journal of current aspects*, *5*(3), 32–53.

Kagoire, M. T. O., Wambi, M., Buluma, A., Tusiime, W. E., Gusango, E. H., & Senkumba, J. (2024). Teachers' Autonomy in Adapting Pedagogical Practices for Effective Implementation of the Secondary School Competency-Based Curriculum in Uganda. *East African Journal of Education and Social Sciences*, *5*(6), 76-89.

KICD. (2017). *Basic Education Curriculum Framework*. Kenya Institute of Curriculum Development.

Kubai, E. (2023). A critical review of the challenges facing the competency-based assessments in the competency-based curriculum in Nairobi County, Kenya. *Journal of Education and Practices ISSN 2617-5444 (ONLINE) & ISSN 2617-6874 (PRINT)*, *3*(3), 1-13.

Muktar, A. I., Mwania, P., & Kimeu, R. (2022). The Influence of Teachers' In-service Training on Successful Roll-out of Competency-Based Curriculum in Public Primary Schools in Mandera East Sub-County, Mandera County, Kenya. *Journal of Popular Education in Africa*, *6*(10), 75-87.

Ngatia, D. G., Wambugu, P. W., & Changeiywo, J. (2021). Study on the Effects of Interactive Multimedia Simulation Advance Organisers Teaching Approach on Students' Motivation to Learn Secondary School Physics. *Newest Updates in Physical Science Research Vol. 10*, 155-165.

Ngeno, B. (2023). The Relationship between Teacher Training and the Implementation of a Competency-Based Curriculum in Public Primary Schools: A Case Study in Kericho County, Kenya. *East African Journal of Education Studies*, *6*(1), 280-290.

Shor, I. (1992). *Culture Wars: School and Society in the Conservative Restoration*. University of Chicago Press.

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The uneven road to digital transformation: Information systems use in civil society project management

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ABSTRACT

This study investigated how Civil Society Organisations (CSOs) in Tanzania adopt Information Systems (IS), with a focus on their shift from paper-based methods to digital tools in project management. Based on the Technology-Organization-Environment (TOE) framework and institutional theory, the research examines how technological capabilities, organisational conditions, and external pressures influence patterns of IS use across key functional areas. Data were gathered through a cross-sectional survey of 272 CSOs across five Tanzanian regions, representing a variety of geographic and operational contexts. Using descriptive statistics and analysis of variance (ANOVA), the study assessed IS adoption levels in both internal and external project functions. The findings reveal a fragmented and selective landscape of adoption. Offline systems still dominate in internal areas such as planning and budgeting, while manual methods remain common in resource and cost management. Conversely, internet-based tools, especially social media, are widely adopted, mainly driven by donor visibility and reporting needs. However, specialised project management systems are seldom used due to financial limitations, technical complexity, and a mismatch with existing workflows. Although device allocation tends to favour externally focused functions, most organisations configure and adapt digital tools across different departments. The study concludes that IS adoption among Tanzanian CSOs is flexible but mainly influenced by external factors, with digital tools often fulfilling compliance and communication rather than boosting internal efficiency. These findings highlight the importance of a more balanced and strategic digital transformation, backed by targeted capacity-building, donor alignment, and fair infrastructure investment. The study recommends that Tanzanian CSOs pursue strategic digital transformation by strengthening internal systems, enhancing staff digital skills, and adopting suitable IS technologies to bridge the internal and external digital gap, improve operational efficiency, and support sustainable, organisation-wide digital integration.

Keywords: Civil Society Organisations, Digital Transformation, Information Systems, IS Technology Adoption, Project Management

I. INTRODUCTION

The growing integration of Information Systems (IS) across sectors in Tanzania demonstrates both notable progress and ongoing hurdles in the country's digital transformation journey. Over the past twenty years, various national projects such as the Human Resource for Health Information System (HRHIS), Training Institutions Information System (TIIS), and the electronic Logistics Management Information System (eLMIS) have shown how digital tools can improve data accuracy, coordination, and decision-making in public sector management (Ishengoma et al., 2019; Ishijima et al., 2015; Ngulugulu et al., 2023). These successes highlight the increasing recognition of IS as a vital component for transparency, efficiency, and evidence-based governance. However, the continued presence of fragmented systems, limited user capacity, and infrastructural gaps, especially outside urban areas, has hindered the development of a fully integrated digital ecosystem across sectors.

Within Tanzania's civil society sector, the adoption of information systems (IS) technologies has primarily been pragmatic and donor-driven rather than strategically institutionalised (Mboera et al., 2021; Namayala et al., 2024). Civil Society Organisations (CSOs) tend to focus on systems that improve visibility, support donor accountability, and enhance stakeholder communication, such as social media, email platforms, and online collaborative tools. In contrast, more complex systems such as Project Management Information Systems (PMIS), data integration platforms, or cost-control applications are less common due to financial and technical limitations, as well as a preference for immediate, tangible results (Pitao et al., 2022; Rahman et al., 2018). The disparities in digital infrastructure between urban and rural CSOs further exacerbate this challenge, as gaps in infrastructure and connectivity limit system functionality and ongoing use.

Globally, Information Systems have transformed how organisations manage projects, coordinate teams, and interact with stakeholders. For CSOs, digital tools are essential enablers of transparency, accountability, and operational

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efficiency (Benbya et al., 2020; Varajão et al., 2022). They support project design, budgeting, procurement, and monitoring functions while enabling real-time reporting to donors and beneficiaries (Sandra & Alexander, 2025). In Tanzania, where CSOs operate with limited resources, IS adoption is not just a technical upgrade but a strategic response to external pressures and internal capacity challenges (Kalolo et al., 2021; Wijatmoko et al., 2025). Therefore, understanding how Tanzanian CSOs transition from paper-based to digital systems is crucial to fostering sustainable digital transformation that enhances governance, performance, and societal impact.

1.1 Statement of the Problem

Despite the progress made by Tanzania in advancing the use of digital technology, many Civil Society Organisations (CSOs) still depend on paper-based and semi-digital tools for project management, data analysis, and reporting. While practical, the paper-based approach limits scalability, reduces data accuracy, and slows decision-making, especially in an organisational environment where development programs are becoming more data-driven and complex (Mboera et al., 2021; Nyandongo et al., 2019). In contrast, specialised Information Systems (IS) have been established to significantly enhance operational efficiency, stakeholder coordination, and evidence-based accountability (Ishengoma et al., 2019; van Besouw & Bond-Barnard, 2021). Experiences from Tanzania's public sector relating to the adoption and use of eLMIS and HRHIS have demonstrated the transformative power of digital platforms in strengthening planning, monitoring, and service delivery (Ishijima et al., 2015; Ngulugulu et al., 2023).

On the other hand, when observing the private sector under the civil society lens, the adoption of IS reflected as remaining inconsistent and fragmented, with selective use across organisational functions. Existing studies (Kock et al., 2020; Namayala et al., 2024) show that most CSOs adopt tools that improve external visibility and donor reporting, such as social media and communication platforms, while internal project management systems are rarely used. As a result, a dual landscape of limited digital engagement, where front-end functions are digitized while leaving the core operational processes to still rely on manual or offline methods (Pitao et al., 2022; Wijatmoko et al., 2025). Such uneven IS-technology uptake on one end implicates adaptive experiences, yet inconsistent adoption patterns on the other. Such experiences have led to limited system integration within organizational processes and, in turn, led to inefficiencies in the implementation of development projects.

Despite the growing concerns about the importance of digital tools in civil society practices, Tanzania is experiencing a shortage of empirical evidence on how its CSOs are adopting the IS in the management of social projects. Little is known of the CSOs' utilization of IS technologies across project functions or how these patterns vary across organisations and regions. This study aims to map and analyse the patterns of IS adoption within Tanzanian CSOs, focusing on the extent, types, and functional use of digital tools in project management as the sector transitions from paper-based to digital systems.

1.2 Research Objective

To examine how digital tools are used across key project management functions.

II. LITERATURE REVIEW

2.1 Theoretical Review

To better understand the dynamics of IS adoption in CSOs, this study uses the Technology–Organisation–Environment (TOE) framework along with Institutional Theory as complementary perspectives. The TOE framework describes adoption across three connected dimensions: the technological context, including factors such as ease of use, perceived usefulness, and the compatibility of IS tools with current practices; the organisational context, which covers leadership commitment, financial and human resources, and internal policies; and the environmental context, involving donor expectations, regulatory frameworks, and sectoral competition. This framework has been widely applied to evaluate adoption readiness in low-resource settings, such as sub-Saharan Africa, where infrastructural challenges and institutional fragility hinder digital transitions. For CSOs, the TOE framework is especially relevant, as resource limitations, donor dependence, and unreliable digital infrastructure greatly influence their ability to transition from paper-based to digital project management systems. (Díaz-Arancibia et al., 2024).

Institutional theory deepens this understanding by highlighting the social, political, and normative forces that shape organisational decisions. CSOs often adopt technologies not only for operational gains but also to satisfy coercive pressures from donors and regulators, to meet normative standards based on professional accountability, or to conform to mimetic pressures driven by peer imitation and the desire for social acceptance and legitimacy. (Arshad et al., 2020; Zeng et al., 2021). This is especially clear in prioritising external-facing digital tools, such as social media and reporting dashboards, that fulfil visibility and transparency demands from donors and the public.

This is especially evident in the focus on digital external tools like social media and reporting dashboards, which meet the visibility and transparency demands of donors and the public.

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Furthermore, recent research on status quo bias in technology adoption indicates that even when digital tools are accessible, organisations may choose traditional systems because of familiarity, risk aversion, or internal resistance to change. (Nugawela & Sedera, 2022). This tendency is more pronounced in small and mid-sized CSOs, where staff capacity and digital leadership might be limited. Such resistance can hinder deeper integration of IS tools, especially in back-office functions like budgeting or procurement.

Together, the TOE framework and Institutional Theory, reinforced by behavioural insights from bias theory, provide a solid theoretical foundation for analysing the uneven, selective, and externally focused nature of IS adoption in CSOs. They demonstrate that the shift from paper to digital is not merely a technical upgrade but a complex process shaped by contextual factors, institutional logics, organisational capacity, and psychological attitudes toward change.

2.2 Empirical Review

Empirical studies including that of Ardito et al. (2025) and (Kostalova et al., 2015) are consistent with the fact that, the adoption process of Information Systems technology across organisations is empirically gradual, uneven, and context-dependent. The basic definition of IS technology adoption refers to the decision to acquire, install, and implement digital systems to enhance operational functions; however, the speed and scope of adoption vary widely based on factors such as organisational size, leadership commitment, financial resources, and technological readiness (Lambiase et al., 2025; TechSoup, 2021).

In Tanzanian, public institutions have reported achieving key milestones in IS technology adoption across sectors through initiatives like the Human Resource for Health Information System (HRHIS), the Training Institutions Information System (TIIS), and the electronic Logistics Management Information System (eLMIS). Specific studies (Ishengoma et al., 2019; Ishijima et al., 2015; Ngulugulu et al., 2023) bear witness to how the public sector experiences the IS adoption benefits through enhanced data quality, planning, and service delivery. On the contrary, when looking at the private sector Mboera et al. (2021) and Namayala et al. (2024) observed that, observed that, similar progress has not been seen within Civil Society Organisations (CSOs). The use if IS technology remains selective, uneven, and donor-driven mainly across organizations. The studies further indicated that the motives behind the use of IS technology by most organizations in Tanzania are primarily compliance with financial reporting procedures, donor requirements, and public visibility. At the same time, internal systems for project management, resource allocation, and data analytics remain underdeveloped.

The uneven patterns of IS technology adoption are not unique to Tanzania; on a global scale, studies have also shown limitations on the use of IS technology across complex or strategic project tasks. According to Kolisch et al. (2005) in Germany, only 20% of organisations were observed to use IS technology for managing multi-project portfolio. Similarly, in Brazili Duarte et al. (2012) had reported that just 24% of organizations had employed IS technology in designing their projects. Mboera et al. (2021) further observed that only 38.5% of organisations were committed to using IS technology regularly, with specific functions for data management. Such experiences highlight a persistent gap between IS technology availability and actual implementation. In the Tanzanian private sector experience, external actors are primed with considerable influence on the patterns of IS technology adoption across organizations. As observed by Al-Adwan et al. (2021) and Twi-Brempong et al. (2020), donor requirements and accountability expectations are often featured to influence organisational decisions to adopt IS technology, mainly for compliance, resulting in superficial changes rather than full integration of IS at both operational and strategic levels. This has created a model of IS technology adoption that emphasizes visibility over organisational learning or process efficiency (Wijatmoko et al., 2025).

Organizations are experiencing practical challenges in the process of adopting IS technologies. This hinders the effectiveness and sustainability of use of respective digital tools. According to (Kalolo et al., 2021; Lashayo et al., 2018; Rahman et al., 2018), in the process of adoption of IS technologies, Organizations are facing issues such as staff turnover, limited technical skills, and inadequate access to reliable internet and power infrastructure. Pitao et al. (2022) further established the uneven IS technology adoption experiences by asserting that hybrid digital-paper workflows are common in rural organisations, where digital systems often coexist with manual methods due to infrastructural instability and limited vendor support.

The literature, therefore, highlights a dual challenge in Tanzania's civil society sector. While the adoption of IS technology is seen as a crucial means towards enhanced project efficiency, transparency, and scalability of social projects, its adoption varies across functions and regions. The study builds on these findings by analysing patterns of IS adoption among Tanzanian CSOs, focusing on which project functions are digitised, how adoption differs among organisations, and the transformation pathways that emerge in a context influenced by both opportunities and limitations.

Although the digital transformation of Civil Society Organisations (CSOs) has attracted increasing academic interest, most current research focuses on broad adoption factors, sector-wide digital readiness, or access to technology. These studies provide limited insights into how information systems (IS) are adopted at the operational level within

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project management, especially regarding how specific tools are used internally and externally (Al-Adwan et al., 2021; TechSoup, 2021). Furthermore, few empirical studies examine the distribution and intensity of IS use across planning, budgeting, donor reporting, and resource tracking, despite these areas being vital to CSO performance.

A significant gap also exists in understanding how CSOs in resource-limited settings, such as Tanzania, manage digital adoption without integrated strategies or reliable infrastructure. While global research recognises that institutional pressures, donor mandates, and usability concerns influence adoption decisions (Chen et al., 2025; Zeng et al., 2021), it rarely clarifies how these factors lead to selective and fragmented digital adoption at the operational level. This study fills that gap by empirically analysing actual patterns of IS adoption across project functions in Tanzanian CSOs, providing a grounded view of how digital transformation often occurs unevenly, adaptively, and is shaped by external influences.

III. METHODOLOGY

This study employed a cross-sectional survey design, whereas data were gathered from a specific group at a single point in time. The methodology is known to be cost-effective and efficient, ideal for identifying trends in how CSOs across Tanzania utilise IS, and enables the generalisation of findings across the broader sector.

3.1 Study Area

The research was conducted in five regions: Dar es Salaam, Arusha, Kilimanjaro, Iringa, and Mwanza. Each area was chosen to represent different realities faced by CSOs when adopting IS technologies. Dar es Salaam is Tanzania's economic centre, and it embodies early adopters, while Arusha and Kilimanjaro represent donor-driven environments due to their mix of international and local NGOs. Equally, Iringa and Mwanza exemplify the challenges CSOs encounter in semi-urban and rural areas. Overall, this urban–rural balance provided a comprehensive view of the CSO landscape.

3.2 Study Population and Sampling

The study examined a list of CSOs officially registered with the Ministry of Community Development, Gender, Women, and Special Groups (MoCDGWS) for the financial year 2022/23, amounting to 11,703 organisations. To make the study manageable and statistically reliable, researchers focused on NGOs involved in project management and service delivery. Using Yamane's formula (with 95% confidence and a 5% margin of error), the target sample size was determined to be 387 CSOs.

Due to limited resources and some non-responses, 272 organisations ultimately participated about 70.3% of the target, which was still sufficient for meaningful analysis. A multistage probability sampling method was employed: CSOs were sorted by region, listed alphabetically, and then selected using systematic random sampling. Each CSO nominated one staff member involved in IS-related decisions to represent them in the survey based on the researcher-specified criteria.

3.3 Unit of Analysis and Unit of Inquiry

The organisation itself served as the unit of analysis, meaning the study examined CSOs as a whole. However, the data was collected from one key respondent per organisation, and the unit of inquiry was usually someone directly involved in using or managing IS tools.

3.4 Data Collection Methods

A structured questionnaire served as the primary data collection tool. It was designed to assess how far CSOs have progressed in adopting IS across four levels: Paper-based tools, Offline software applications, Internet-based platforms, and Specialised Project Management Information Systems (PMIS). The questionnaire was pre-tested to verify its relevance and reliability within the Tanzanian context. It included closed-ended and multiple-choice questions. CSOs could complete it either electronically or on paper. To encourage participation, follow-ups were carried out over three months.

3.5 Data Analysis

Data analysis combined both descriptive and inferential statistics. Descriptive stats like frequencies, percentages, averages, and standard deviations helped summarise IS adoption levels. Then, to explore further, the study used one-way ANOVA (Analysis of Variance) to test whether there were significant differences across different CSO functions. Results are presented in tables and charts to make them easy to compare and interpret. This mixed approach helped the study offer both a broad overview and detailed insights into what drives (or hinders) IS adoption in Tanzanian CSOs.

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IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Demographic Characteristics of Respondents

Participants in this study came from a diverse range of Civil Society Organisations (CSOs) across Tanzania, offering a clearer view of the environment in which Information Systems (IS) are being adopted. Geographically, most CSOs were concentrated in Dar es Salaam, with about 40% both registered and actively operating there, which makes sense, as it is the country's main economic and administrative centre. However, they are not all based in the capital. Places like Mwanza (22.8%), Arusha (18.8%), and Kilimanjaro (16.5%) also had a significant CSO presence, while Iringa had far fewer. This distribution shows that while Dar es Salaam leads in access and infrastructure, CSOs in other regions still play a vital role, often working with fewer resources and facing more logistical challenges.

In terms of structure, the sector remains relatively young and operates on a smaller scale. Around two-thirds of CSOs have been established for less than ten years. A quarter have been operating for between ten and nineteen years, and only a small number have lasted more than thirty. Staffing levels are also lean, with over 60% of organisations having fewer than 15 employees, and only a few exceed 40. Most of these CSOs manage just 1 to 4 projects at a time, reflecting their limited scale and constrained resources. Interestingly, 64% said they have some form of specialised IS in place. However, that leaves more than a third without any, mainly due to costs, lack of technical expertise, or simply not knowing what is available. Even among those who have adopted IS tools, most are still relatively new to them, highlighting that digital uptake remains inconsistent and recent.

Respondents held a variety of roles. The largest groups included Directors (18.4%), Programme/Project Administrators (16.5%), Officers (15.1%), and ICT Officers (13.6%). The study also gathered insights from CEOs, Coordinators, and M&E Officers covering perspectives from both leadership and operational levels. Most respondents had 2–5 years of experience, with nearly 9% having over 15 years' experience. This mix created a good balance between younger, digitally savvy staff and more experienced professionals. Age-wise, the data clearly shows: 59.2% were between 21 and 40 years old, while only 7.3% were over 50. Therefore, we are looking at a relatively young workforce full of potential for driving digital change, but in need of training and stronger institutional support to achieve it.

The CSO landscape in Tanzania is young, small, and often under-resourced, but it is also driven. Yes, regional differences, staffing difficulties, and inexperience can slow digital progress. Nevertheless, with a growing number of young, tech-savvy professionals already in place, there is real potential to accelerate digital transformation if the sector gains the access, expertise, and long-term support it requires.

4.1.2 The Patterns of IS-Technology Adoption among CSOs

The findings indicate that IS adoption within CSOs varies significantly, with offline computer systems still dominating core management tasks like planning (47.5%) and budgeting (44.0%). This suggests continued dependence on familiar, low-complexity tools that prioritise ease of use over integration. Meanwhile, internet-based applications are becoming increasingly important for external-facing functions, with social media (65.3%) standing out as the most widely adopted tool. This shows the sector's focus on visibility, communication, and donor engagement. Functions such as data integration (33.3%), collaborative work management (30.0%), and progress reporting (27.4%) have moderate adoption, indicating a slow shift toward more interactive and connected systems.

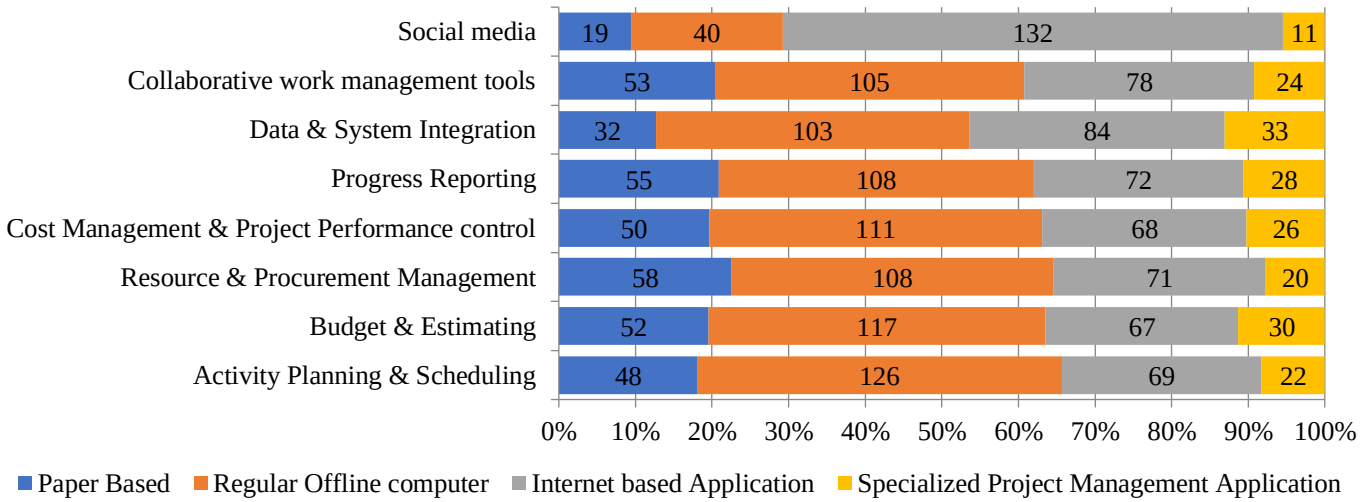

Figure 1

Frequency Distribution of the Type of IS Applicable in Organisational Functions

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However, the minimal use of specialised project management software, rarely exceeding 13.1%, highlights ongoing barriers to adopting advanced solutions, such as cost, complexity, or lack of technical skills. The continued reliance on manual methods in resource management (22.6%) and cost management (19.1%) emphasises that traditional paper-based practices still coexist with digital tools, especially in areas where data credibility, compliance, or infrastructure challenges are more significant. Overall, the findings indicate a fragmented adoption landscape, where CSOs selectively adopt digital tools, focusing more on external communication than on improving internal project management systems. Inferential analysis confirmed that IS adoption levels vary significantly across organisational functions.

Table 1

Descriptive Statistics on Types of IS Applicable in Organisational Functions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Planning & Scheduling (Activity)	265	2.25	.846	.052	2.14	2.35	1	4
Budget & Estimating	266	2.28	.907	.056	2.17	2.39	1	4
Resource & Procurement Management	257	2.21	.880	.055	2.10	2.31	1	4
Cost Management & Project Performance Control	255	2.27	.894	.056	2.16	2.38	1	4
Progress Reporting (Project documents and data)	263	2.28	.914	.056	2.17	2.39	1	4
Data & System Integration (Portals and dashboards)	252	2.47	.876	.055	2.36	2.58	1	4
Collaborative work management tools	260	2.28	.893	.055	2.17	2.39	1	4
Social media	202	2.67	.722	.051	2.57	2.77	1	4
Total	**2020**	**2.33**	**.881**	**.020**	**2.29**	**2.37**	**1**	**4**

Presented in Table 2, the results for a one-way ANOVA revealed a statistically significant difference ($F(7,2012) = 6.858$, $p < 0.001$), indicating that not all functions adopt IS at the same rate.

Table 2

ANOVA on types of IS applicable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36.518	7	5.217	6.858	.000
Within Groups	1530.529	2012	.761		
Total	**1567.048**	**2019**			

Post Hoc tests showed that social media tools (M = 2.67) were adopted more than most other internal functions, with mean differences from –0.39 to –0.46 ($p < 0.05$). Data/system integration (M = 2.47) also had slightly higher adoption than planning, budgeting, and procurement, though these differences did not always reach statistical significance. A homogeneous subsets analysis grouped the functions into three categories: the first included resource management, planning, budgeting, cost management, progress reporting, and collaborative tools (M approximately 2.21–2.28), which rely on offline or hybrid systems; the second consisted of data/system integration (M = 2.47), just above the first group; and the third was led solely by social media (M = 2.67), clearly identified as the most adopted digital tool. This suggests that CSOs prioritise external-facing systems, especially for communication and advocacy, over back-office functions like budgeting and resource management.

4.1.3 IS Device Availability

Table 3 presents the descriptive statistics regarding the availability of devices for Information Systems (IS) functions. The table summarizes key statistical measures including the mean, standard deviation, and standard error, as well as the 95% confidence interval for the mean. It also provides the minimum and maximum values, the sample size (N), and the total sum of devices reported.

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Table 3

Descriptive Statistics on the Availability of Devices for IS Functions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Sum
					Lower Bound	Upper Bound			
Planning & Scheduling (Activity)	194	3.15	2.800	.201	2.76	3.55	1	35	612
Budget & Estimating	188	2.88	1.824	.133	2.62	3.14	1	15	541
Resource & Procurement Management	178	2.68	1.789	.134	2.42	2.94	1	15	477
Cost Management & Project Performance Control	186	3.02	2.575	.189	2.64	3.39	1	20	561
Progress Reporting (Project documents and data)	192	3.62	3.976	.287	3.05	4.19	1	35	695
Data & System Integration (Portals and dashboards)	192	3.39	3.655	.264	2.87	3.91	1	35	650
Collaborative work management tools	180	3.39	3.521	.262	2.87	3.91	1	35	610
Social media	166	3.56	4.199	.326	2.92	4.20	1	35	591
Total	**1476**	**3.21**	**3.164**	**.082**	**3.05**	**3.37**	**1**	**35**	**592**

The descriptive results in Table 3 show that device availability for IS functions varied significantly across CSOs, with a total of 1,476 cases (N) recorded across all functions. The number of valid responses per function ranged from 166 to 194, indicating good representation but also some differences in organisational reporting across functions. The functions with the highest average number of devices are progress reporting (N = 192, M = 3.62), social media (N = 166, M = 3.56), and data/system integration (N = 192, M = 3.39). These findings suggest that organisations allocate more digital resources to externally visible activities, especially those related to donor accountability and communication. The relatively high maximums of up to 35 devices in these categories further illustrate that some better-resourced CSOs can invest heavily in these areas.

In contrast, the internal project management functions such as budgeting (N = 188, M = 2.88) and resource management (N = 178, M = 2.68) were reported with the fewest device allocations. This suggests that the back-office operations are still under-resourced compared to outward-facing functions. Such lower averages and smaller totals in these functions point to the ongoing structural imbalances in how CSOs prioritise their digital investments. The wide variation in device counts (ranging from 1 to 35 across functions) further highlights the significant disparities in digital infrastructure among organisations. It is further noted that some CSOs have limited device capacity, which in turn restricts their ability to integrate IS technology in the processes, while others show greater infrastructure readiness. In general, the findings have revealed a selective pattern of digital tools allocation. The CSOs are directing limited hardware resources toward functions that align with donor and stakeholder expectations, leaving internal project management functions relatively under-resourced. Findings from the inferential analysis confirmed these disparities.

Table 4

ANOVA on the Availability of Devices

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	142.666	7	20.381	2.045	.047
Within Groups	14627.645	1468	9.964		
Total	**14770.311**	**1475**			

The Analysis of Variance (ANOVA) results revealed statistically significant differences in device allocation across functions ($F(7,1468) = 2.045$, $p = 0.047$), evidencing the uneven distribution of hardware within the organization and across project management functions. The Post Hoc analysis results have indicated that the most significant difference was between progress reporting (M = 3.62) and resource management (M = 2.68), with a mean gap of –0.94. Although the results did not achieve conventional significance ($p = 0.081$), they still show a notable trend. Since it is closely linked to donor accountability, the reporting function tends to receive more resources. The results of homogeneous subsets analysis clustered the functions into three tiers: resource management and budgeting at the bottom, cost management and planning in the middle, and data integration, collaborative tools, social media, and progress reporting at the top. The clustering further solidifies the previous findings that CSOs allocate device resources mainly to externally visible, donor-driven functions, while internal control and resource management remain under-resourced.

4.1.4 Active Devices for IS Access

When assessing the number of active devices dedicated to the IS access, the results indicate a total of 1,426 cases (N) documented across project management functions, while the individual response counts ranged from 156 to 188 per function. The results imply a broad coverage of organisational functions, and the manifestation of some

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variation. On average, the responding CSOs reported an average of three active devices per function (M = 3.03), with minimal differences across functions. The functions with the most digital tools were progress reporting (N = 185, M = 3.43), social media (N = 156, M = 3.40), and data/system integration (N = 188, M = 3.20). This consolidates the suggestion that the functions related to donor communication, advocacy, and system-level integration tend to have slightly more active device support. Notably, maximums of 35 devices in some cases reflect the impact of a few well-resourced CSOs, highlighting significant disparities among organisations.

Table 5

Descriptive Statistics on Number of Active Devices

Number of Devices	**N**	**Mean**	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**
					Lower Bound	**Upper Bound**		
Planning & Scheduling (Activity)	186	2.92	2.803	.206	2.51	3.32	0	35
Budget & Estimating	182	2.71	1.855	.138	2.44	2.99	1	15
Resource & Procurement Management	174	2.61	1.746	.132	2.35	2.88	1	14
Cost Management & Project Performance Control	182	2.90	2.498	.185	2.53	3.26	1	20
Progress Reporting (Project documents and data)	185	3.43	3.874	.285	2.87	3.99	1	35
Data & System Integration (Portals and dashboards)	188	3.20	3.542	.258	2.69	3.71	1	35
Collaborative work management tools	173	3.09	3.369	.256	2.59	3.60	1	35
Social media	156	3.40	4.133	.331	2.75	4.06	1	35
Total	**1426**	**3.03**	**3.084**	**.082**	**2.87**	**3.19**	**0**	**35**

Compared to other functions, budgeting (N = 182, M = 2.71) and resource management (N = 174, M = 2.61) had the fewest active devices, though their averages remained close to the overall mean. This indicates that, while these functions have fewer total devices, CSOs ensure most available devices are actively used. The few inactive devices across all categories show deliberate efforts to maximize limited digital resources.

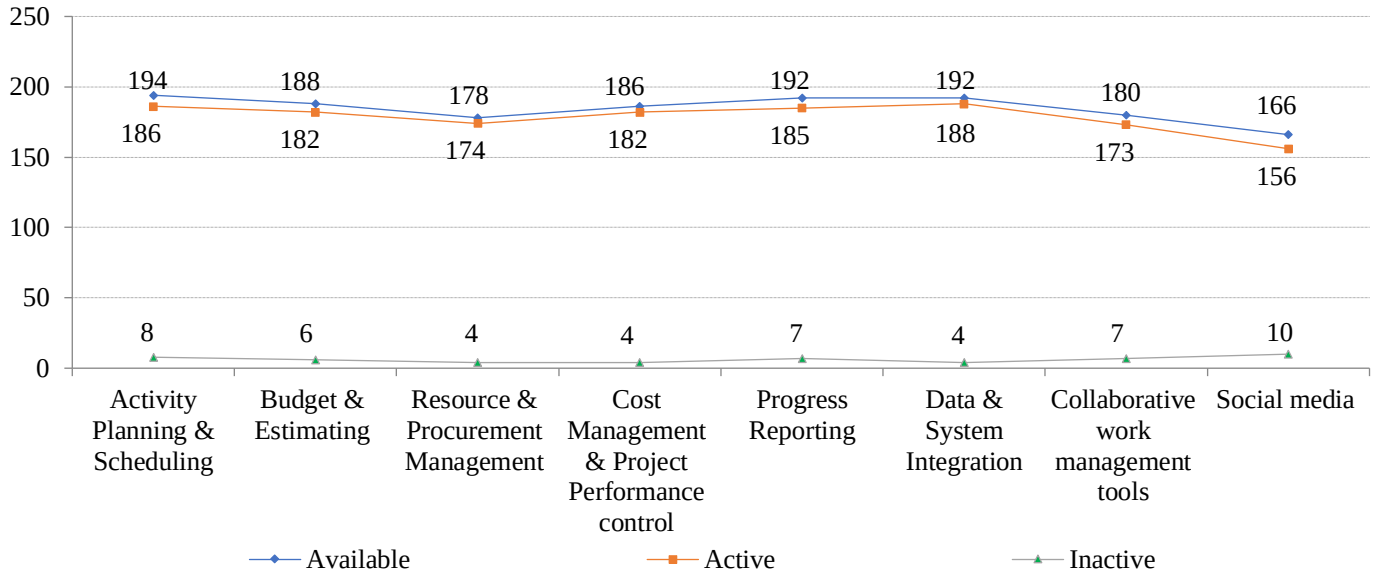

Figure 2

Descriptive Statistics on Active Devices (FIPs) Setup for IS Software Access

Overall, the results highlight a consistent pattern of device activation across different functions, contrasting with the uneven distribution of overall device availability. Once devices are acquired, CSOs seem dedicated to ensuring their active use across multiple functions, whether internally or externally focused. This reflects a resource-optimisation strategy in which organisations, even in limited-resource settings, aim to eliminate redundancy and ensure that available infrastructure supports various project management functions.

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Table 6
ANOVA on Active Devices (FIPs) setup

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	110.551	7	15.793	1.666	.113
Within Groups	13440.212	1418	9.478		
Total	13550.763	1425			

Inferential results showed no statistically significant differences across functions. The ANOVA produced $F(7,1418) = 1.666$, $p = 0.113$, indicating that variations in the number of active devices are not meaningful. Post hoc tests supported this, with all pairwise comparisons being non-significant. Homogeneous subsets analysis grouped all functions into a single cluster, suggesting uniformity in device activation. These results indicate that once devices are available, CSOs deliberately ensure they are configured to provide PMIS access across all functional areas, whether internal or external. This contrasts with the uneven distribution of devices, demonstrating that activation practices are consistent even when resources are limited.

In general, the results highlight an uneven yet deliberate transition from paper-based to digital systems in CSO project management. While core administrative functions still mainly rely on offline tools, internet-based platforms are increasingly used for communication, collaboration, and donor visibility. The adoption of specialized project management software remains very low due to cost and technical barriers. Device allocation is inconsistent, with reporting, integration, and social media receiving the most resources, reflecting external accountability pressures. However, once devices are available, their activation for PMIS access is generally consistent across different functions. These findings thus confirm that CSOs are motivated and prepared to embrace digital transformation. Still, their adoption patterns remain stratified by function, influenced by resource availability, donor requirements, and organizational priorities.

4.2 Discussion

The findings show that the adoption of Information Systems (IS) technology among Tanzanian Civil Society Organisations (CSOs) varies significantly and is often specific to different functions. This variation is affected by internal constraints, donor expectations, and how organisations perceive the usability and value of these systems. Using the DeLone and McLean IS Success Model, the Technology–Organisation–Environment (TOE) framework, and Institutional Theory, the results suggest that technological features, organisational capacity, and external factors collectively influence these adoption patterns.

For CSOs, the ongoing reliance on offline tools and manual procedures for key internal operations is a clear trend in IS technology use. Based on the evidence, over 70% of CSOs surveyed were still utilising the standalone computers for planning and budgeting, and more than 60% depend on paper-based systems for managing resources and costs. These CSOs' preferences demonstrated their undeniable trust in the traditional offline tools, which are regarded as more familiar, dependable, and less technically demanding. Being in a resource-limited environment, simpler systems are often preferred by organisations because the more complex IS technologies can be costly and demand technical skills that many CSOs and users do not possess. This observation aligns with that of Kostalova et al. (2015), who found that smaller organisations frequently opt for the least complex IS technologies for smooth operation. Additionally, Nugawela and Sedera (2022) Affirmed that many organisations still rely on paper records for their auditability and compliance with donor requirements, describing it as "status quo bias." behaviour

The findings have also emphasized that only 13.6% of CSOs in Tanzania have adopted specialized project management software, despite recognizing its advantages. The main barriers were identified to include high costs, complexity, and poor compatibility with existing workflows. This tension between potential and actual use echoes the assertion by DeLone and McLean (1992) that technology fails to create value when it is not well-suited to its context. Similar patterns were observed globally in studies by Duarte et al. (2012) and Kolisch et al. (2005), who found low adoption of project-specific IS technology tools in Brazil and Germany, even in situations where IS technology is more readily accessible. The Tanzanian experience confirms that the availability of IS technology alone is not sufficient; Information systems technology must be adapted, supported, and integrated into the daily operations of an organisation.

The fact that the tools for external communication, such as social media, exhibited the highest adoption rates, with over 80% of CSOs using them, suggests that these platforms are appreciated for being affordable, user-friendly, and effective for donor reporting, advocacy, and stakeholder engagement. This supports Al-Adwan et al. (2021) conclusion that perceived usefulness and external visibility motivate IS adoption in non-profits. Similarly, Chen et al. (2025) highlights that digital adoption by CSOs is often externally driven. The Institutional Theory further interprets this finding as a response to donor pressure and the desire to conform to sector norms, as claimed by Zeng et al. (2021) and Arshad et al. (2020). From a critical perspective, the donor-driven adoption creates an internal-external digital

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divide, where essential functions like budgeting, procurement, and performance monitoring largely remain offline as compared to other functions.

The study has further revealed uneven access to digital resources. Devices and connectivity are usually concentrated in departments responsible for reporting, communications, and M&E, while project management teams often remain under-resourced in terms of IS technology tools. However, many CSOs try to maximise the use of their limited resources; over 60% share devices across departments to broaden access to project management systems. The practice demonstrates a practical approach to resource constraints. It aligns with the ideal assertion by DeLone and McLean (2003, 2016) that continued system use, even with limitations, is vital for IS success. It also highlights organisational adaptability in the face of structural challenges.

The adoption of IS technology in Tanzanian CSOs is confirmed to be adaptable but uneven across organisational and project functions. This reveals a "dual digital reality". On one side, CSOs effectively utilise digital tools to meet donor demands and enhance transparency. On the other hand, the digitisation of internal management and planning functions remains poorly implemented and underdeveloped despite the existence of the IS technology. While these digital tools are in use, they are often applied in limited ways, with little integration into strategic decision-making. This illustrates what TechSoup (2021) describes as being "digitally active but digitally fragile" organisations operating with scattered tools and minimal infrastructure. The findings underscore the importance for Tanzanian CSOs to progress from superficial adoption towards a more strategic, organisation-wide digital transformation. Addressing the internal–external digital divide will involve dedicated efforts to enhance internal systems, adapt tools to local needs, and invest in staff capacity building. These actions can improve efficiency, promote organisational learning, and ensure that digital technologies meet both immediate donor requirements and long-term sustainability.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined how Tanzanian CSOs adopt IS and revealed a clear trend of IS technology adoption across organisational and project management functions. However, the pattern of IS technology adoption is inconsistent, mainly driven by external forces, and remains incomplete. While tools like spreadsheets and paper-based processes still dominate internal functions such as budgeting and procurement, more sophisticated project management systems are rarely used in operations. Conversely, technologies supporting operational functions, such as social media, online reporting, and tools that enhance visibility and help meet donor requirements, are gaining popularity among CSOs. The trend indicates that external pressure, rather than internal strategy, is driving the shift to digital tools. In other words, many CSOs are adopting digital tools not because they improve their operations, but because they help them meet donor expectations.

Even with these limitations, CSOs are doing their best with the limited resources at their disposal. If they acquire digital devices, they allocate and use them effectively across departments to improve efficiency. This kind of adaptability is praiseworthy; however, the digital transition remains superficial and has not reached the deeper levels of project planning, decision-making, or internal operations.

This study sheds new light on how CSOs in low-resource settings, particularly in Tanzania, adopt Information Systems (IS). It goes beyond surface-level observations to demonstrate that digital adoption is not uniform. Instead, it is function-specific, uneven, and heavily influenced by institutional pressures. By expanding the DeLone & McLean (2003, 2016) IS Success Model, the research indicates that perceptions of system quality, usability, and alignment with daily workflows often explain why many CSOs continue to rely on manual processes and offline tools.

By applying the Technology–Organisation–Environment (TOE) framework and Institutional Theory, the study deepens our understanding of IS technology adoption. It describes how donor expectations, infrastructure challenges, and internal capacity collectively influence the use of digital tools, whether, how, or why they are employed. Often, visibility is prioritised over internal efficiency. This insight is significant as it challenges the standard binary view of "adopted" versus "not adopted." Instead, this function-level perspective provides a more precise and heightened understanding of digital transformation in the non-profit sector.

5.2 Recommendations

Based on the study findings, the following are some practical, long-term recommendations to support CSOs in Tanzania in adopting digital technology in a meaningful and sustainable manner. CSOs should go beyond just offering tools. CSOs need more than just a few apps or gadgets; they require genuine support. This entails coordinated assistance from donors, technology providers, and policymakers. The emphasis goes beyond mere compliance; it's about investing in infrastructure, training staff, and ensuring access to truly user-friendly systems.

CSOs should incorporate technology into the core workflow. Users should not just use information systems (IS) for reports or online displays; instead, they should incorporate them into their daily operations. Consider budgeting,

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planning, and resource allocation. That's where the real value lies. CSOs should invest in people, not just platforms. To keep up with digital transformation, CSOs' staff need to be ready for it. This requires a significant investment in digital training, allowing teams throughout the organization to confidently and effectively use the tools they're given.

Donors shouldn't just set digital rules and walk away. Donors should focus on helping CSOs grow digitally by funding infrastructure, offering relevant training, and making sure the technology they introduce can actually be used and maintained over the long term. Create an affordable shared tech solution. Policymakers and support organizations step in to help develop affordable, shared platforms that operate across organizations, thereby reducing redundant efforts. Close the digital gap with long-term thinking. This involves developing infrastructure, continuous skills training, and innovative policy reforms. This shift should transition away from short-term, donor-driven projects and instead prioritize strategic, inclusive, and sustainable solutions.

Ethical Approval

The study received ethical approval from the Directorate of Research and Postgraduate Studies at Mzumbe University, documented by a letter with reference number AL.3/267/01/170.

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Authors' Contributions

Credit: **Simon Augustine Kilasara**: Conceptualization, Funding acquisition, Investigation, Methodology, Analysis, and Writing, Review & editing; **Robert Makorere**: Supervision, Formal analysis, Validation, Writing, Review & editing.

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REFERENCES

Al-Adwan, A. S., Albelbisi, N. A., Hujran, O., Al-Rahmi, W. M., & Alkhalifah, A. (2021). Developing a holistic success model for sustainable e-learning: A structural equation modeling approach. *Sustainability*, *13*(16), Article 9453. https://doi.org/10.3390/su13169453

Ardito, V., Cappellaro, G., Compagni, A., Petracca, F., & Preti, L. M. (2025). Adoption of artificial intelligence applications in clinical practice: Insights from a survey of healthcare organizations in Lombardy, Italy. *Digital Health*, *11*. https://doi.org/10.1177/20552076251355680

Arshad, M., Farooq, M., Afzal, S., & Farooq, O. (2020). Adoption of information systems in organizations: Understanding the role of institutional pressures in a collectivist culture. *Journal of Enterprise Information Management*, *33*(2), 265–284.

Benbya, H., Nan, N., Tanriverdi, H., & Yoo, Y. (2020). Complexity and information systems research in the emerging digital world. *MIS Quarterly: Management Information Systems*, *44*(1), 1–17. https://doi.org/10.25300/MISQ/2020/13304

Licensed Under Creative Commons Attribution (CC BY-NC)

Chen, M., Martins, T. S., Zhang, L., & Dong, H. (2025). Digital transformation in project management: A systematic review and research agenda. *Systems*, *13*(8), 625. https://doi.org/10.3390/systems13080625

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, *3*(1), 60–95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

DeLone, W. H., & McLean, E. R. (2016). *Information systems success measurement*. *Foundations and Trends® in Information Systems*, *2*(1), 1–116. https://doi.org/10.1561/2900000005

Díaz-Arancibia, J., Hochstetter-Diez, J., Bustamante-Mora, A., Sepúlveda-Cuevas, S., Albayay, I., & Arango-López, J. (2024). Navigating digital transformation and technology adoption: A literature review from small and medium-sized enterprises in developing countries. *Sustainability*, *16*(14), Article 5946. https://doi.org/10.3390/su16145946

Duarte, F., Hecksher, S. D., & Bartholo, R. S. (2012). The role of information technology in small and medium enterprises in the Brazilian oil offshore industry. *International Journal of Computer Applications in Technology*, *43*(3), 285–293. https://doi.org/10.1504/IJCAT.2012.046316

Ishengoma, F., Mselle, L., & Mongi, H. (2019). Critical success factors for m-Government adoption in Tanzania: A conceptual framework. *Electronic Journal of Information Systems in Developing Countries*, *85*(1), 34-39. https://doi.org/10.1002/isd2.12064

Ishijima, H., Mapunda, M., Mndeme, M., Sukums, F., & Mlay, V. S. (2015). Challenges and opportunities for effective adoption of HRH information systems in developing countries: National rollout of HRHIS and TIIS in Tanzania. *Human Resources for Health*, *13*(1), 23-27. https://doi.org/10.1186/s12960-015-0043-1

Kalolo, A., Gautier, L., Radermacher, R., Srivastava, S., Meshack, M., & De Allegri, M. (2021). Factors influencing variation in implementation outcomes of the redesigned community health fund in the Dodoma region of Tanzania: A mixed-methods study. *BMC Public Health*, *21*(1), 19-24. https://doi.org/10.1186/s12889-020-10013-y

Kock, A., Schulz, B., Kopmann, J., & Gemünden, H. G. (2020). Project portfolio management information systems' positive influence on performance – The importance of process maturity. *International Journal of Project Management*, *38*(4), 229–241. https://doi.org/10.1016/j.ijproman.2020.05.001

Kolisch, R., Meyer, K., & Mohr, R. (2005). Maximizing R&D portfolio value. *Research-Technology Management*, *48*(3), 33–39. https://doi.org/10.1080/08956308.2005.11657313

Kostalova, J., Tetrevova, L., & Svedik, J. (2015). Support of project management methods by project management information system. *Procedia – Social and Behavioral Sciences*, *210*, 96–104. https://doi.org/10.1016/j.sbspro.2015.11.333

Lambiase, S., Catolino, G., Palomba, F., Ferrucci, F., & Russo, D. (2025). Exploring individual factors in the adoption of LLMs for specific software engineering tasks. *arXiv*. https://arxiv.org/abs/2504.02553

Lashayo, D. M., Alkawaz, M. H., & MD Johar, M. G. (2018). Adoption of e-learning systems in Tanzania's universities: A validated multi-factors instructor's model. *Journal of Theoretical and Applied Information Technology*, *96*(20), 6864-6876. https://www.researchgate.net/publication/329031223

Mboera, L. E. G., Rumisha, S. F., Mbata, D., Mremi, I. R., Lyimo, E. P., & Joachim, C. (2021). Data utilisation and factors influencing the performance of the health management information system in Tanzania. *BMC Health Services Research*, *21*(1), 498. https://doi.org/10.1186/s12913-021-06559-1

Namayala, P., Kondo, T., & Mselle, L. (2024). Analyzing the institutionalization of free and open source software adoption in Tanzanian higher education institutions. *Journal of ICT Systems*, *2*(1), 1–18. https://doi.org/10.56279/jicts.v2i1.56

Ngulugulu, M. M., Rwela, E. G., & Mkwizu, N. Y. (2023). Adoption of human resource information systems in public sectors in Tanzania. *East African Journal of Information Technology*, *6*(1), 66–76. https://doi.org/10.37284/eajit.6.1.1191

Nugawela, S., & Sedera, D. (2022). Status quo bias in users' information systems (IS) adoption and continuance intentions: A literature review and framework. In *Proceedings of the Australasian Conference on Information Systems (ACIS 2022)* (Vol. 1). University of Melbourne.

Nyandongo, K. M., Lubisi, J., Mwana Nyandongo, K., & Lubisi, J. (2019, July). Assessing the use of project management information systems and its impact on project outcome. In *Proceedings of the International Conference on Industrial Engineering and Operations Management (IEOM 2019)*, Pilsen, Czech Republic (pp. 1501–1512). IEOM Society International.

Pitao, J. V. S., Nabas, J. P., Matias, J. B., Timosan, J. Q., & Rollorata, G. G. (2022). Development and evaluation of enhanced National Greening Program monitoring and document archiving system using DeLone and McLean

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IS success model. In *Proceedings of the 2022 11th International Conference on Networks, Communication and Computing (ICNCC 2022)* (pp. 334–340). ACM. https://doi.org/10.1145/3579895.3579945

Rahman, H., Shafique, M. N., & Rashid, A. (2018). Project success in the eyes of project management information system and project team members. *Abasyn Journal of Social Sciences, 11*(2), 34-39.

Sandra, C. J., & Alexander, K. (2025). Tech solutions on effectiveness of monitoring and evaluation in health programs in Kenya. *Open Science Journal, 3*(1), 185–201. https://scholarnestpublishers.com/index.php/osj/index

TechSoup Global Network. (2021). *Data handling and digital readiness in civil society: Global study 2020*. TechSoup Global Network. https://www.techsoupglobal.org/TechSoup-Global-Network-Summit-2021-Publication.pdf

Twi-Brempong, C., Gu, H., Oppong-Baah, T., Owusu, I., Gyamfi, E., Pinas, J., Kim, E., Nsaful, A. A., Boateng, F. A., Ofosu, D., Nketiah, E., Adjei, M., Fianko, S. K., Gyamerah, K. K., & Owusu, J. A. (2020). The impact of access to electricity on e-commerce adoption in Ghanaian SMEs: An empirical analysis. *Open Journal of Business and Management, 8*(1), 245–261. https://doi.org/10.4236/ojbm.2020.81015

van Besouw, J., & Bond-Barnard, T. (2021). Smart project management information systems (SPMIS) for engineering projects – Project performance monitoring & reporting. *International Journal of Information Systems and Project Management, 9*(1), 78–97. https://doi.org/10.12821/ijispm090104

Varajão, J., Lourenço, J. C., & Gomes, J. (2022). Models and methods for information systems project success evaluation – A review and directions for research. *Heliyon, 8*(12), e11977. https://doi.org/10.1016/j.heliyon.2022.e11977

Wijatmoko, S., Akbar, B., Sartika, I., & Elsye, R. (2025). Collaborative governance in digital transformation policy implementation for MSMEs in Jakarta: A socio-legal perspective. *Jurnal Hukum Unissula, 41*(2), 366–393. https://doi.org/10.26532/jh.v41i2.45941

Zeng, F., Chan, H. K., & Pawar, K. (2021). The effects of inter- and intra-organizational factors on the adoption of electronic booking systems in the maritime supply chain. *International Journal of Production Economics, 236*, 108119. https://doi.org/10.1016/j.ijpe.2021.108119

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Effectiveness of ward education officers' supervisory roles on enhancing teachers' work performance in public secondary schools in Arusha District Council, Tanzania

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ABSTRACT

The study was looking at the role of Ward Education Officers (WEOs) in ensuring the improvement of performance of teachers at public secondary schools in the Arusha District Council in Tanzania. The massive growth of secondary schools due to national education policies requires high supervisory practices to provide quality education. The actual performance of the students in academics is very poor while WEOs are present, which indicates that there is a need to have a new approach at the supervisory level. The study was governed by the Clinical Supervision model (CSM), which encourages teaching by use of systematic steps, and Total Quality Management (TQM), which is based on the principles of continuous improvement and focused on quality assurance in different aspects. A concurrent triangulation design was used to collect data from 135 respondents who were DSEOs, WEOs, heads of schools, and teachers by using simple random and purposive sampling. The study demonstrates that WEOs have crucial responsibilities of monitoring the number of enrolled students, examining school management systems, and providing teaching assistance to teachers. The WEOs face some challenges during the implementation of their responsibilities, which limit their service delivery since they lack adequate transport, lack training, and work in poor facilities. The study revealed that WEOs should have resources and encouragement to accomplish improved teacher performance, which will result in increased student outcomes. Also, the study suggests improving the effectiveness of WEO by providing superior logistical assistance, enhancing ongoing professional growth, and resolving the issue of supervision.

Keywords: Arusha District Council, Public Secondary Schools, Supervision, Teachers' Performance, Ward Educational Officers (WEOs)

I. INTRODUCTION

Education supervision is considered to be a powerful instrument in strengthening the daily practice of teachers throughout the instructional process all over the world (Abdurahman et al, 2025). Recent research indicates that observing teaching, coordination of professional development, offering specific input, and performance can make notable improvements when school systems offer consistent, firm, and decisive regulatory assistance (Gardezi et al, 2023). Other studies indicate that supervisory practices and organized feedback are linked with high-quality teaching and eventually enhance the value of student outcomes (Balikci et al., 2025).

In low and middle income countries, the functions of supervision are divided between head teachers, head of subjects, district officers, and inspectorates (Ngole & Mkulu, 2021). They are effective based on their ability, financing, and specific directives that focus on the areas of instruction. Research in African school regimes illustrates that teachers are guided by their supervisors and translate the advice into the classrooms. Nevertheless, the issues of managing more than one school, the poor state of infrastructure, and the absence of instructional resources hamper the successful follow-up and goal attainment (U-Sayee & Adomako, 2021)

Guides and policies on shifting supervision to training and quality assurance have been introduced in ministries in Sub-Saharan countries, although there is uneven implementation (Zickafoose et al, 2024). Professional development and school progress planning are carried out regularly; however, challenges include an expensive workload, insufficient materials, and inadequate transportation. It is suggested to strengthen instructional leadership and allocate more human and financial resources to facilitate regular assessment (Dafa et al, 2020). The new literature connects clinical training, involving the use of pre-conference, observation, feedback, and post-conference with competency, motivation, and performance in educators, with collaborative supervision that increases curriculum alignment and students' achievement (Park, 2020).

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Tanzania has experienced growth in both government and non-government secondary schools because of the increase in demand for education and facilities by both the government and non-governmental organizations. Education policies like Education for All (EFA), Free Education Policy (Primary Education Development Planning-PEDP and Secondary Education Development Planning-SEDP) have also led to this enlargement (MOEST, 2004-2009). Such reforms as the School Quality Assurance (SQA) framework prioritize the idea of professional supervision as an ongoing monitoring and evaluation process that entails providing feedback based on continuous improvement (Charles, 2024). In the context, school leaders and head teachers in both state and private schools are expected to make sure that the curriculum is enforced effectively within their pedagogical supervision.

At Arusha District Council, the teachers are under the supervision of the ward Education Officer (WEO), who is in charge of primary and secondary schools and is concerned with the teaching, feedback, follow up and teacher discipline. This study fills the gap in the literature that does not specifically relate the limited number of school visits by WEOs to the quantifiable elements of teacher performance, including school attendance, preparation, and practice. The government secondary schools are required in every ward (Mwesiga & Okendo, 2018), and the quality of education is controlled by WEOs (URT, 2014). Generally, WEOs closely collaborate with heads of schools and ensure proper teaching and learning and adopt education objectives by inspecting, performing advisory functions, and coordinating policies (Ally et al, 2022)

Previously, school inspections were a fault-finding activity, but were reinvented in 2015 as a quality assurance activity, where the inspector has been turned into a quality assurance officer (Mbwana & Onyango, 2021). Through this reform, Ward Education Coordinators (WECs) became Ward Education Officers (WEOs) as explained by Haule et al (2020). The Education Act required the WEOs to supervise all the school activities in their wards (URT, 2014). However, Maige et al (2022) observed that not all WECs had the required skills to manage the teachers effectively, leading to adverse attitudes and inefficiency. Thus, the role of WECs was conquered by WEOs whose appointments were focused on professionalism, rather than on work experience.

Over the years, national examination performances have indicated poor academic performance of people in the public secondary schools. The data available from the results of the National Examination Council of Tanzania (NECTA) between 2018 and 2020 show that the number of students who got division one and two was still less than those who received division four and zero (Mosenda, 2021). Though several reasons of failure have been mentioned, not much focus has been paid to analyzing the efficiency of WEOs in promoting teachers' competence. Therefore, the suggested study aimed to evaluate the effectiveness of WEOs in their supervisory roles to enhance teacher performance who are working in the public secondary schools at Arusha District Council, hence to enhance student performance and long-term learning.

1.1 Statement of the Problem

International and national education policies have led to the rapid growth in the number of secondary schools in Tanzania, Ministry of Education, Science and Technology (MOEST, 2004-2009). Such growth underscores the importance of expanding access to education and the necessity of high-quality learning supported by efficient oversight of daily school-based activities. Nevertheless, a rise in the number of public secondary schools has created challenges in monitoring at zonal levels since the number of schools is large, and the size of their location makes this process challenging (Haule et al, 2020). The government has attempted to deal with this obstacle by placing WEOs in charge of schools in their wards to improve teaching and teacher performance by supervising them systematically (Ehren & Visscher, 2006)

Although this has been decentralized, the academic performance of students in Arusha District has not been satisfactory, as many students record divisions four and zero in the national examinations 2020. Despite the various issues that have been discussed as a cause of poor performance, little attention has been paid to the issue of the supervisory roles played by WEOs. Thus, the current study examines the role of the supervisory functions of WEOs in the performance of teachers and their contribution towards the academic performance in Arusha District.

1.2 Research Questions

i. To assess the supervisory roles of Ward educational officers in public secondary schools.
ii. To determine the extent of Supervision Roles Performed by Ward Educational Officers on Teachers' Work Performance in Public Secondary Schools in Arusha District Council
iii. To investigate the effectiveness of Ward Education Officers' supervisory roles on enhancing teachers' work performance in public secondary schools.

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II. LITERATURE REVIEW

2.1 Theoretical Review

This study was guided by two theories, the Clinical Supervision Model (CSM) and Total Quality Management (TQM)

2.1.1 Clinical Supervision Model (CSM)

The Clinical Supervision Model (CSM) was developed by Goldhammer (1969), and it is a procedural model of supervision that is systematically geared towards the enhancement of teaching by use of systematic steps that include pre-observation conference, observation, post-observation conference, and follow-up. In recent studies, the model has been proven to be effective in improving the professional competence of teachers. As an example, Handayani et al. (2024) discovered that the Goldhammer model helps teachers develop through regular feedback that is well structured, and Chaula (2023) noted that effective clinical supervision is based on the presence of good communication and collaboration between teachers

According to the existing literature, the CMS can improve the quality of instruction and teacher performance, especially when supervision is no longer based on inspection but on developmental assistance. The existing literature, the CMS can improve the quality of instruction and teacher. This was supported by Sharma and Srivastava (2023), who highlighted the importance of coaching and mentoring in teacher education, which is consistent with the principles of the model. On the same note, Tumwine and Waiswa (2025) promoted the concept of mentorship-based supervision within the education systems of East Africa. The present study builds on the application of CSM to the context of Tanzania, hypothesizing that the systematic approach can be employed by Ward Education Officers to enhance the practice of supervision, teacher motivation, and accountability, as well as effective delivery of instruction.

2.1.2 Total Quality Management (TQM)

Total Quality Management (TQM) is a management philosophy that was introduced by Armand V. Feigenbaum in 1961 and was developed by W. Edwards Deming, and is based on the principles of continuous improvement, customer satisfaction, and stakeholder engagement. TQM, originally projected to serve the manufacturing sector, has been extended to be used in all industries, including education, where its facilities, leadership dedication, involvement of stakeholders, process effectiveness, and efficient feedback channels (Al Kadri & Susant, 2022)

TQM is one of the most important frameworks that can be used in the education system to ensure quality assurance and institutional effectiveness. According to research works by Mtitu (2025) and Mbuya & Amos (2024), the implementation of TQM principles has increased the probability of stakeholder satisfaction and has also positively affected teaching and learning results of any educational organization in Tanzania. On this basis, this study uses the concept of TQM to investigate how the concept can be adapted by WEOs to improve the performance of teachers in the Arusha District Council in the public secondary schools.

2.2 Empirical Review

The review was about to identify relevant empirical literature based on the current research objectives of this study, to assess the effectiveness respectively in Ward Education Officers (WEOs) in teachers' work performance. Theoretical and empirical research on supervision practices, teachers' motivation, and performance outcomes at the secondary school level was reviewed challengingly. The review addressed the impact of organized supervision on the quality of teaching. The review addressed the impact on the quality of teaching of structured supervision, feedback, and professional support. The Committee also took into account the difficulties WEOs encounter in carrying out their supervisory responsibilities effectively. Moreover, there was also evidence of the correlation between good supervision and increased teacher responsibility and student achievement. This review serves as a baseline for detecting gaps and guiding the current study at the Arusha District Council, Arusha Region.

2.2.1 Supervisory Roles of Ward Education Officers in Public Secondary Schools

The Ward Education Officers (WEOs) is a crucial person who is crucial in improving teacher performance in the government secondary schools by enforcing educational policies and national objectives. Their control is well known in enhancing teacher effectiveness. Arthur and Lekule (2020) have discovered that WEOs' supervision has a strong impact on teacher performance at Tanzanian public schools, and Tarimo and Lekule (2024) have also indicated its role in professionalism and the quality of teaching. Fuime (2024) also supported that the training of WEOs enhances their qualities as supervisors and, through them, the quality of education. On the same note, Protas and Ismail (2024) found that the teachers' motivation and performance are increased with improvements in their working conditions, which was also reinforced by Minja (2025), who found strong teacher performance in the private schools within Arusha District to be caused by the environment.

The performance of teachers is the effectiveness, professionalism, and capacity of the teachers in making the students successful, which is enhanced through effective supervision. Katemah et al. (2022) discovered that the

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performance of teachers is improved because of the involvement of WEOs in planning, coordination, and classroom investigation, and Minja (2025) discovered a direct correlation between leadership, supervision, and teacher appreciation. Furthermore, Ngereza et al. (2024) and Christopher et al. (2024) stated that direction and control have a positive influence on the job satisfaction of the teachers. Still, the majority of studies, public or private schools consider and adopt one research model (Ngereza et al. 2024; Minja 2025; Christopher et al. 2024). Thus, the proposed study takes a mixed-methods approach to investigate how WEOs can enhance teachers' performance in the Arusha District Council in the public secondary schools.

2.2.2 The extent of Supervision Roles Performed by Ward Education Officers on Teachers' work performance in Public Secondary schools in Arusha DC

Ward Education Officers (WEOs) are very important in enhancing teacher performance by supervising instruction in the schools. In Tanzania, studies indicate that classroom observation, mentoring, and WEOs feedback improve lesson preparation, classroom management, and teacher evaluation and increase the effectiveness of the instruction (Mwakabenga, 2025). However, the impact of this is usually low due to the insufficient professional growth, lack of proper transport infrastructure, and workload, minimizing the possibilities of making follow-up and monitoring.

Arusha and other districts have shown that teacher motivation and accountability with adequately trained WEOs and good logistical support have shown improvements, but where there is low supervision, the same has not been achieved, and thus there is a need to empower WEOs' capacity and the support services to ensure sustainable improvements (Malengo & Omari, 2023)

2.2.3 The Effectiveness of Ward Education Officers' Supervisory roles on enhancing Teachers' Work Performance in Public Secondary Schools

Ward Education Officers (WEOs) are greatly concerned with the work performance of teachers in an effort to accomplish the education policies and school goals. According to recent studies, the role of the supervisory function of WEOs has been emphasized in improving the performance of teachers in relation to their students. Katemah et al. (2022) have discovered that WEOs' supervision in Longido District has greatly enhanced teacher attendance. Similarly to Malengo and Omari (2023) was noted that the activities of WEOs played a positive role in the performance of teachers and the academic success of students in Lushoto District.

According to Newa et al. (2025), the problem–solving skills and leadership ability of the head of schools increase the job performance of teachers in Siha District. Also, Edgar (2022) highlighted the fact that supportive supervision in the form of close to school influences the performance of teachers positively in public schools in the secondary setting. Likewise, Christopher et al. (2024) have established the evidence that WEOs' contributions to internal and external mechanisms of school supervision foster teacher performance and positively affect student learning outcomes. Altogether, these investigations prove that the successful WEOs supervision plays a crucial role in teacher effectiveness and in the quality of education in the schools of Tanzania.

III. METHODOLOGY

3.1 Research Design

The study adopted a concurrent triangulation design, enabling simultaneous collection of both quantitative and qualitative data. This design was appropriate as it allowed for the comparison and integration of results from both approaches to determine whether findings supported or differed, thereby strengthening interpretation in line with the research objectives.

3.2 Study Area

The research was conducted in public secondary schools within the Arusha District Council, which is located in the Northern part of Tanzania. The area was selected due to limited literature on the effectiveness of ward Education Officers (WEOs) in executing supervisory roles and persistent concerns about their inefficiency, which has contributed to low teacher performance and poor academic outcomes. This context provides an appropriate setting for examining WEOs' effectiveness in enhancing teachers' work performance.

3.3 Target Population

The target population comprised 1,148 people, including one District Secondary Education Officer (DSEO), 23 Ward Education Officers (WEOs), 33 head of schools (HOSs), and 1,091 teachers (from Arusha District Secondary Education Office, 2025). The DSEO was included as a key informant due to direct supervision of WEOs, while WEOs themselves were central participants. HOSs contributed administrative insights, and teachers, being the primary beneficiaries of supervision, provided firsthand perspectives on WEOs' influence on their work performance.

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3.4 Sample Size and Sampling Procedures

Following Gay and Airasian's (2003) recommendation of 10-30% of the population for research sampling, the study involved one (1) DSEO, seven (7) WEOs (30%), seven (7) heads of schools (21%), and 120 teachers (11%). A combination of purposive and simple random sampling techniques was employed. Purposive sampling selected the DSEO, WEOs, and HOSs due to their strategic roles, while simple random sampling was used for teachers to ensure representativeness and equal selection chances.

3.5 Data Collection

Data were collected using open-ended questionnaires for teachers and WEOs and interview guides for DESO, HOSs, as well as WEOs. The questionnaires that were open-ended assisted teachers and WEO to give their views and familiarity at their own will, and gave real and detailed information. DSEO, HOSs, and WEOs interview guides allowed addressing the issue of supervisory practices, challenges, and strategies. These instruments were used together, and they led to triangulation, making the findings appear more precise. Therefore, the tools were well appropriate to the qualitative aspects of the research and were able to describe different views on how supervising and teaching are conducted in the Arusha District Council.

3.6 Data Analysis

Quantitative data from the questionnaire were analyzed using descriptive statistics and presented in frequency tables and percentages for clarity. Qualitative data from interviews were analyzed through content analysis, which involved transcribing, categorizing, and identifying patterns aligned with research objectives. Direct quotations were used where appropriate to illustrate participants' perspectives and strengthen interpretations.

3.7 Ethical Considerations

Authorization was obtained from relevant authorities before fieldwork. Participants were informed about the study's purpose, assured of voluntary participation, anonymity, and confidentiality. Interviews were conducted privately to ensure comfort and honest responses. Research data were securely stored to prevent unauthorized access, and all sources were properly acknowledged to uphold academic integrity and avoid plagiarism.

IV. FINDINGS & DISCUSSION

The study was carried out in the Arusha District Council, where the total number of 135 respondents where by the few of the potential participants was interviewed, and the responses of the majority of the respondents the responses were statistically analyzed based on the objectives.

4.1 Response Rate

4.1.1 Assessment of Ward Education Officers' Supervisory Roles in Public Secondary Schools in Arusha District Council

Table 1 records show that there are plentiful supervisory roles that can be performed by Ward Education Officers (WEOs) in the perception of teachers and WEOs themselves in Arusha District Council. It emphasizes the extent to which WEOs participate in observing the administration in schools, academics, and students' well-being, which is necessary to ensure the quality of education.

Table 1.

Supervisory Roles of Ward Education Officers in Public Secondary Schools in Arusha District Council (n=127)

Parameters	**Teachers n = 120 f (%)**	**WEOs n = 7 f (%)**	**Total n = 127 f (%)**
Monitoring students' enrolments in schools	115(96)	7(100)	122(88)
Inspection of the school's administration and academics	110(92)	6(86)	116(91)
Collecting data and updating academics statics	116(97)	7(100)	123(97)
Dealing with teachers and students discipline	84(70)	5(71)	89(70)
Solving social and administrative challenges in schools	80(67)	5(71)	85(67)
Promoting schools' development via the community & donors	91(76)	4(57)	95(73)
Monitoring and controlling capitation funds in schools	75(63)	5(71)	80(63)
Monitoring students' and teachers' attendance and truancy	89(75)	6(86)	95(73)
Assessing and Evaluating students' academic performance	79(66)	6(86)	85(67)
Ensuring the implementation of education policies	112(93)	7(100)	119(94)

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These findings demonstrate that the majority of teachers (96%) and all WEOs (100%) believed that one of the most important supervisory roles would be to monitor student enrolments. Equally, 91% of all participants identified the inspection of school administration and academics as a WEOs' role, and 97% felt that gathering and updating academic information is also in their job description. Furthermore, 67% of the respondents reported dealing with social and administrative issues, while 73% stated that they facilitated the growth of schools through the help of the community and donors. Supporting attendance and truancy was established by 73% and 94% (Table 1), affirming that it is a significant supervisory role to ensure education policies are put into practice, as observed by the DSEO regarding WEOs' role.

> "*WEOs play critical roles as supervisors to ensure that the educational standards are maintained. They have a crucial role in keeping track of student enrolment as well as teaching how resources required in justifiable education should be allocated".*

Also majority of WEOs responded by saying that;

> *"In most cases, we instruct the teachers on how they are expected to execute their day-to-day. We underline their teaching quality and establish accountability in the teaching and learning process."*

In addition, HOS responded to the raised interview question on the experience with the support and feedback of WEOs in the preparation of teachers' lesson and their teaching performance, and the responses were as follows;

> *"WEOs provide high support to us, which is very important in the education sector. Their evaluations and suggestions assist us in refining lesson preparations, and this makes us refine our lesson preparations and motivates us to maintain better performances."*

4.1.2 Extent of Ward Education Officers' Supervisory Roles on Teachers; Work Performance in Public Secondary Schools in Arusha District Council

Table 2 proves the degree of WEOs' supervisory activities on the work performance of teachers in the public secondary schools. The reactions showed that advising on the teaching techniques, controlling professional behavior, as well as attendance assessment, are some of the areas that have a major effect on the teacher's performance.

Table 2.

Extent of Ward Education Officers' Supervisory Roles on Teachers' Work Performance in Public Secondary Schools in Arusha District Council (n=127)

Parameters	**Teachers n = 120 f (%)**	**WEOs n = 7 f (%)**	**Total n = 127 f (%)**
Advising teachers on improving teaching	100(83)	6(86)	106(83)
Monitor the teacher's professional code of conduct maintaining	110(92)	7(100)	117(92)
Advising teachers on the chain of command	100(83)	6(85)	106(83)
Assessing teachers' attendance in school & classroom	96(80)	6(86)	102(80)
Assessing teachers' lesson preparations	118(98)	7(100)	125(98)
Identifying and solving teachers' matters	90(75)	5(71)	95(75)
Evaluating teachers' performance	91(76)	6(86)	96(76)
Assessing teachers' classroom teaching/learning	80(67)	5(71)	85(67)
Enhancing teachers' training service	60(50)	4(57)	64(50)
Discussing with teachers on education matters	85(71)	5(71)	90(71)
Unite with teachers on students' challenges	115(96)	7(100)	127(97)

These results evidenced that 83% of the respondents declared one of the main supervisory roles of WEOS is advising teachers on how to improve teaching and learning, where 92% admitted that it is also important to monitor the professional code of conduct of teachers. In the same way, 83% affirmed giving recommendations on the chain of command, and 80% emphasized assessing the attendance. Nearly all of the respondents, 98% (Table 2), supported that one of the significant supervisory functions is less preparation for evaluation. Moreover, three-quarters of them supported the idea of problem identification and resolution of teachers, three-quarters agreed to the idea of performance assessment, two-thirds affirmed classroom assessment, half stated teacher training among others, three-quarters affirmed discussion of educational issues, and three-quarters affirmed the idea that jointly solving the problems of the students would enhance the performance of the teachers.

Also, the interviewed WEOs responded to how they enhance teachers' training services.

> *"All teachers are usually given an initial opportunity to volunteer as Ward education Officer and, in this capacity, we normally start by determining the needs of teachers in terms of training by observing and reporting classroom performance. This assists in making us know who requires assistance and where. Additionally, we usually link with DSEO, among other parties, to create short training programs and*

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workshops on the side of teachers. Nevertheless, due to insufficient financial means, they are not always likely to do it regularly. Government should, therefore, allocate a sufficient amount of funds toward training teachers".

Furthermore, they were asked to respond to how they monitor teachers' professional code of conduct, and some of the responses were as follows;

"One of the primary tasks that we have to do is to make sure that teachers are disciplined and follow the professional code of conduct. In case of misconduct, we will mainly investigate at the ward level and then report to the DSEO. We have always focused on fairness and confidentiality. We constantly remind teachers of their punctuality, commitment, and ethical obligations in their work. Well behaving among teachers create a good tone among the students and enhance the image of the school. Professional teachers have a better performance and impact on their students negatively".

4.1.3 Effectiveness of Ward Education Officers' Supervisory Roles in Enhancing Teachers' Working Performance

The results in Table 3 showed the efficiency of the supervisory role of WEOs in enhancing the professional performance of teachers. Such foremost tasks as the consultation on teaching, supervising professional behavior, and dealing with classroom issues were reported to be highly effective in the opinions of both teachers and WEOs.

Table 3.

Effectiveness of Ward Education Officers' Supervisory Roles in Enhancing Teachers' Working Performance in Public Secondary Schools in Arusha District Council (n=127)

Parameters	**Teachers n = 120 f (%)**	**WEOs n = 7 f (%)**	**Total n = 127 f (%)**
Advising teachers on improving teaching	118(98)	6(85)	124(98)
Monitoring of teachers' professional code of conduct	115(96)	7(100)	122(96)
Advising teachers on the chain of command	100(83)	7(100)	107(84)
Assessing teachers' attendance in school & classroom	90(75)	5(71)	95(75)
Assessing teachers' lesson preparations	95(79)	7(100)	102(80)
Identifying and solving teachers matters	86(72)	5(71)	91(72)
Evaluating teachers' performance	80(67)	6(85)	86(68)
Assessing teachers' classroom teaching/learning	78(65)	5(71)	83(65)
Enhancing teachers training service	90(75)	5(71)	95(75)
Discussing with teachers on education matters	86(72)	6(85)	92(72)
Unite with teachers on students' challenges	120(100)	7(100)	127(100)

The findings revealed that 98% of respondents agreed that advising teachers on improving teaching was a key aspect of WEOs' effectiveness. Moreover, 96% confirmed that monitoring teachers' professional code of conduct enhanced performance, while 84% recognized the importance of guiding teachers on the chain of command.

Additionally, 75% acknowledged that assessing teachers' attendance and lesson preparation were vital elements of supervision. Respondents (65%) (Table 3) also indicated that assessing classroom teaching and learning contributed to teacher performance. Interviews further revealed that WEOs play critical roles in promoting teacher in-service training, handling educational matters, and uniting teachers to address students' challenges.

The DSEO was asked

The DSEO was asked about the support from WEOs to advise teachers on the ways to enhance teaching and learning processes among the learners. The DSEO said that;

"The main role that our office undertakes in ensuring that effective teaching strategies are given to the teachers by the Ward education Officers is centralized in our office. We lay stress on the idea of learner-centered practices and promote the process of WEOs mentoring the teachers, particularly those who find difficulties with classroom management and delivering the lesson".

One of the WEO also answered the same question.

"*Our classroom observations are usually followed by the teachers and the discussion of what was good and what should be improved. The recommendations are based on real-world topics like planning the lesson, teaching aids, and evaluation steps, It is not to criticize but to assist them in teaching better".*

Another WEO added that;

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> *"By paying regular visits to the school, we determine areas where teaching methods are deficient and provide drilling services. Those teachers who have acted upon our advice have seen incredible improvement in terms of student interaction and delivery of the lesson".*

In addition, a further interview was carried out to evaluate the lesson preparations of the teachers in relation to WEO's responsibilities. DSEO said that;

> "*Repeated assessment of the lesson preparation of the teachers is one of the vital aspects in pushing up the academic values. We promote WEOs to look through lesson plans, scheme of work, and teaching records on the visit of the supervisors".*

"Also, one of the WEO said that;

> *"In our visits to schools, we examine the lesson plans to ascertain whether they are properly prepared and in line with the syllabi. Proper planning makes teachers more likely to control their classes and, therefore, attain improved learning. Lesson preparation books also let us check on consistency and commitment. At times, we give direct feedback to teachers to enable them to make lesson plans better and more relevant".*

4.2 Discussion

The results showed that Ward Education Officers (WEOs) fulfill various supervisory roles that are necessary to ensure the level of education. Student enrolment monitoring will provide the correct information to allocate resources and plan, and is consistent with the Education and Training Policy, which involves equal distribution of resources (Katemah et al., 2022). Another important supervisory activity that should be executed is the inspection of school administration and academics. Mudavanhu et al. (2024) also highlighted that the role of supervision is to coordinate, manage, and monitor teaching and learning activities to improve the performance of schools.

The research indicates that WEOs, to a great extent, undertake the supervision functions well and enhance the performance of teachers. The majority of the respondents affirmed that WEOs frequently counsel teachers, observe professional behavior, measure attendance, and check lesson plans, which in turn enhance accountability and teaching standards. As mentioned by Sung (2015) as well as Owan and Agunwa (2019), teacher motivation and performance can be improved with the help of effective supervision, guidance, and communication. In addition to that, Mwinyi (2024) observed that ethical monitoring and professional collaboration enhance teacher productivity and, consequently, the school results. Still, the process of teacher training was facilitated in an average way. This indicated the lack of encroachment on the concept of constant professional development, which Protas and Ismail (2024) mentioned. Regardless of this, WEOs' activities of teaching and learning evaluation, teacher-related challenges, and cooperation in student affairs are essential.

The collecting of scholarly statistics by WEOs favors as reinforced by Charles (2024), who posited that supervision enhances the connections and the performance results between the supervisors and the supervisees. Avoiding administrative and social issues by ensuring school development as a result of community and donor involvement further underlines the multidimensional nature of the WEOs in ensuring the creation of a conducive learning environment, which is also true in the policy guidelines of Mbelle (2008) that dictate an emphasis on integrity, civic responsibility, and participatory development. Also, counseling teachers on how to teach better and observe professionalism will increase the teaching quality, and counseling on the chain of command will improve the communication level, professionalism, and discipline in schools. The consistency of accountability and curriculum implementation is supported by regular classroom visits as well as evaluation of lesson preparations.

The responses to the interview were consistent with the quantitative analysis, which means that WEOs assist in health education, as well as financial responsibility, and the Free Basic Education program, as well as organize community participation in the development projects at schools. The practices create transparency, as well as optimize resources, and increase the motivation of teachers. Hence, the supervision of WEOs plays a great role in enhancing the performance of teachers, the development, and quality of education in Arusha District Council.

Although these have succeeded, some obstacles are encumbering good supervision. WEOs also stated that there was poor road infrastructure, long distances between schools, and bad weather that hindered the visiting of schools and the collection of information I time. Poor communication channels and sudden requests by district offices interfere with their work (Malengo & Omari, 2023). ICT skills and lack of access to quality offices, unstable electricity, and internet connection further limit the ability to manage and report data to the required authorities, as supported by Mwinyi (2024). Moreover, school development is also compromised by political interference, such as abuse of the Free Basic Education Policy. The respondents suggested that the government should invest in and improve the quality of education in the Arusha District Council.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The research article came up with a conclusion that Ward Education Officers (WEOs) have important supervisory functions in improving the work performance of teachers in the public secondary schools through the enrolment of students, inspection, solving challenges, promoting developments, supervision of the professional development of teachers, and application of education policies. They also have a mandate to check on how government money is used in implementing educational projects and the performance of the students.

Despite being useful in leadership, supervision, and instilling accountability in the teachers, WEOs have issues of financial constraints, ICT illiteracy, and political intrusion that hinder the implementation of their responsibilities. These obstacles undermine WEOs' oversight roles and indicate implementation ambiguities. It has been highlighted in the study that it is essential to enhance ongoing professional training, logistical support, and links with higher education authorities. Enhancement of these aspects would improve supervision and guarantee sustainable quality education in Arusha District Council, as well as the whole Tanzanian Secondary education system.

5.2 Recommendations

Ward Education Officers' supervisory roles should be mentioned in the secondary education administrative profile for the best administrative, supervision, and monitoring of school development in the implementation of education policy and government control of resources, as well as exercising their duties in public secondary schools. The government should ensure teachers are provided with a good working environment, promotion, accommodations, in-service training, and learning facilities to promote better education. The challenges facing the effectiveness of WEOs should be addressed and solved to effectively lift them in their supervision roles, and the best teachers' working performance in public secondary schools in Arusha District Council, as well as in other districts.

REFERENCES

Abdurahman, A., Sabtula, S. B., & Abdurahman, F. (2025). Leveraging classroom learning: Strengthening instructional supervision to foster teacher development. *Spring Journal of Arts, Humanities and Social Sciences, 4*(1), 8–18. https://doi.org/10.55559/sjahss.v4i1.469

Al Kadri, H., & Susanti, L. (2022, November). Total quality management to improve the quality of higher education in the 21st century. In *The 2nd Padang International Conference on Educational Management and Administration 2021 (PICEMA 2021)* (pp. 251–261). Atlantis Press. https://doi.org/10.2991/978-2-494069-11-4_25

Ally, J., Koda, M. G., & Ogoti, E. (2022). Ward education officers' roles in supporting heads of school in managing public secondary schools in Hai District, Tanzania. *International Journal of Contemporary Applied Researches, 9*(8), 68–81.

Arthur, J., & Lekule, C. S. (2020). Effectiveness of ward education officers' supervision in promoting quality education in secondary schools in Tanzania. *International Journal of Innovative Science and Research Technology, 5*(2), 712–725.

Balikci, S., Gulboy, E., Rock, M. L., & Rakap, S. (2025). A meta-analysis of performance feedback as an evidence-based practice in special education teacher preparation. *Teacher Education and Special Education, 48*(3), 169–191. https://doi.org/10.1177/08884064251356657

Charles, G. (2024). Regional and national public-private dialogue structures in Tanzania: Design, agenda and challenges. *Tanzania Journal of Development Studies, 22*(1), 57–80. https://dx.doi.org/10.56279/NJIY8787/TJDS.v22i1.4

Chaula, L. (2023). School heads' clinical supervision practices and emerging factors. *Journal of Educational Leadership and Supervision, 9*(1), 12–29. https://pmc.ncbi.nlm.nih.gov/articles/PMC9876969/

Christopher, E., Osaki, K. M., & Makundi, C. (2024). Effect of school supervision in improving learning effectiveness in public secondary schools in Ilala Municipality, Dar es Salaam Region, Tanzania. *International Journal of Multidisciplinary Research and Growth Evaluation, 5*(1), 300–312.

Dafa, B. J., Muteti, C. M., & Mandila, T. (2020). Perceptions on effectiveness of heads of schools' instructional supervision on teachers' performance in secondary schools in Ilala Municipality, Tanzania. *Cradle of Knowledge: African Journal of Educational and Social Science Research, 8*(3), 63–73. https://www.ajol.info/index.php/ajessr/article/view/239502

Edgar, S. (2022). Close to school supervision in Tanzania: Collective views on enhancing teachers' job performance. *American Journal of Arts and Human Science, 1*(3), 10–13. https://doi.org/10.54536/ajahs.v1i3.581

Ehren, M. C. M., & Visscher, A. J. (2006). Towards a theory on the impact of school inspections. *British Journal of Educational Studies, 54*(1), 51–72. https://doi.org/10.1111/j.1467-8527.2006.00333.x

Licensed Under Creative Commons Attribution (CC BY-NC)

Fuime, C. (2024). Training needs of ward education officers for ensuring quality education: A study of primary schools in Mkuranga District, Tanzania. *International Journal of Innovative Science and Research Technology, 9*(9), 2266–2272. https://doi.org/10.38124/ijisrt/IJISRT24SEP1330

Gardezi, S., McNamara, G., Brown, M., & O'Hara, J. (2023, September). School inspections: A rhetoric of quality or reality? *Frontiers in Education, 8*, Article 1204642. https://doi.org/10.3389/feduc.2023.1204642

Goldhammer, R. (1969). *Clinical supervision: Special methods for the supervision of teachers*. Holt, Rinehart & Winston.

Handayani, A., Sudadi, & Baitaputra, M. H. (2024). The effectiveness of the Cogan, Goldhammer, and Glickman clinical supervision approach: An adaptive study for the development of teachers' professional competence in elementary schools. *Idarotuna Journal of Administrative Science, 5*(2), 199–214. https://ejournal.akts.ac.id/index.php/idarotuna/article/view/112

Haule, M. E., John, A., & Lekule, C. S. (2020). Effectiveness of ward education officers' supervision in promoting quality education in secondary schools in Tanzania. *International Journal of Innovative Science and Research Technology, 5*(2), 714–716.

Katemah, R. J., Muteti, C., & Abdi, B. (2022). The contribution of ward education officers' supervisory roles on teachers' school attendance in Longido District, Tanzania. *British Journal of Education, 10*(15), 1–11. https://doi.org/10.37745/bje.2013/vol10n15111

Maige, G. A., Mosha, H. J., & Muteti, C. M. (2022). Effectiveness of school mapping and micro-planning on improving the quality of teaching and learning facilities in public primary schools in Arusha Region. *British Journal of Education, 10*(11), 84–102. https://doi.org/10.37745/bje.2013/vol10n1184102

Malengo, F. A., & Omari, J. Y. (2023). The impact of ward education officers on improving primary school students' academic performance in Lushoto, Tanzania. *International Journal of Research and Innovation in Social Science, 7*(2), 401–408. https://econpapers.repec.org/RePEc:bcp:journl:v:7:y:2023:i:2:p:401-408

Mbelle, A. V. (2008). The impact of reforms on the quality of primary education in Tanzania (Vol. 8). Dar es Salaam: Repoa. https://www.repoa.or.tz/wpcontent/uploads/2020/07/08.1%20Amon%20V.Y.%20Mbelle.pdf

Mbuya, B. P., & Amos, O. A. (2024). Implementation of internal school quality assurance team practices for effective academic attainment in secondary schools in Morogoro Municipal, Tanzania. *International Research Journal of Modernization in Engineering Technology and Science, 6*(6), 1–9. https://www.irjmets.com/uploadedfiles/paper//issue_6_june_2024/58641/final/finirjmets1717564563.pdf

Mbwana, S., & Onyango, D. O. (2021). Perceived influence of financial disbursement on school quality assurance in Nyamagana District, Tanzania. *East African Journal of Education and Social Sciences, 2*(2), 1–6. https://doi.org/10.46606/eajess2021v02i02.0070

Ministry of Education, Science and Technology. (2004–2009). *Secondary Education Development Programme (SEDP I)*. Government of the United Republic of Tanzania. https://www.moe.go.tz/en/projects/secondary-education-development-programme-sedp

Minja, D. M. (2025). Working conditions and job satisfaction among private secondary school teachers in Arusha. *Cypriot Journal of Educational Science, 20*(3), 149–162. https://doi.org/10.18844/cjes.v20i3.9690

Mosenda, J. (2021, January 19). What next for those who scored divisions 4 and 0? *The Citizen*. https://www.thecitizen.co.tz/tanzania/magazines/success/-what-next-for-those-who-scored-divisions-4-and-0--3262218

Mtitu, E. A. (2025). Exploring factors for the introduction and implementation of total quality management in Tanzanian higher education institutions. *Journal of Educational Administration and Policy, 5*(1), 45–58. https://www.tandfonline.com/doi/full/10.1080/2331186X.2025.2455767

Mudavanhu, P. N., & Mpofu, P. (2024). Using instructional supervision to improve learners' performance in Eswatini high schools. *E-Journal of Humanities, Arts and Social Sciences, 5*(16), 2810–2823. https://doi.org/10.38159/ehass.202451610

Muswere, M. (2024). School inspectors' perspectives on their instructional leadership support to schools in Zimbabwe. *South African Journal of Education, 44*(3), Article 2409, 1–12. https://doi.org/10.15700/saje.v44n3a2409

Mwakabenga, R. J. (2025). Prospects for secondary school teacher leadership in teaching and professional development in Tanzania. *Teacher Development, 7*, 1–17. https://doi.org/10.1080/13664530.2025.2519558

Mwesiga, A., & Okendo, E. O. (2018). Effectiveness of heads of schools in supervising teachers' teaching activities in secondary schools in Kagera Region, Tanzania. *International Journal of Scientific Research and Management, 6*(04), 91–107. https://doi.org/10.18535/ijsrm/v6i4.sh04

Mwinyi, H. (2024). Challenges and opportunities of implementing education technology in rural and underserved areas of Tanzania: Assessing the sustainability and educational impact of such initiatives. *African Journal of Education and Practice, 10*(4), 27–39. https://doi.org/10.47604/ajep.3031

Licensed Under Creative Commons Attribution (CC BY-NC)

Newa, M. A., Muteti, C., & Mashingia, K. (2025). Extensiveness of problem-solving skills by heads of schools on enhancing teachers' job performance in public secondary schools of Siha District, Tanzania. *International Journal of Scientific Research and Management, 13*(9), 4324–4338. https://doi.org/10.18535/ijsrm/v13i09.el05

Ngereza, E. S., Onyancha, H., & Ogoti, E. O. (2024). Contributions of working conditions on performance of secondary school teachers in Moshi District Council, Tanzania. *Indian Journal of Management and Language, 4*(2), 69–77. https://doi.org/10.54105/ijml.B2059.04021024

Ngole, D. M., & Mkulu, D. G. (2021). Role of heads of schools' supervision in improving quality of teaching and learning in public secondary schools in Ilemela District, Tanzania. *International Journal of English Literature and Social Sciences, 6*(1), 26–32. https://dx.doi.org/10.22161/ijels.61.7

Owan, V. J., & Agunwa, J. N. (2019). Principals' administrative competence and teachers' work performance in secondary schools in Calabar Education Zone of Cross River State, Nigeria. *Online Submission, 7*(1), 20–28. https://doi.org/10.18488/journal.73.2019.71.20.28

Park, C. L. (2020). Using the PMC model to advance research on wisdom: A focus on coping with adversity. *Psychological Inquiry, 31*(2), 182–184. https://doi.org/10.1080/1047840X.2020.1750921

Protas, M., & Ismail, J. H. (2024). An assessment of the working conditions in enhancing teachers' job motivation in public secondary schools in Bunda Town Council, Tanzania. *East African Journal of Education Studies, 7*(4), 246–256. https://doi.org/10.37284/eajes.7.4.2296

Sharma, P., & Srivastava, M. (2023). Reframing teacher supervision: Towards a coaching and mentoring model in teacher education. *International Journal of Educational Research and Development, 5*(1), 45–58. https://carijournals.org/journals/JERD/article/view/3074

Sung, H. (2015). Emotional intelligence and socio-cognitive skills in collaborative teaching and learning. *New Directions for Teaching and Learning, 2015*(143), 61–77. https://doi.org/10.1002/tl.20136

Tarimo, P., & Lekule, C. (2024). Effect of instructional supervision on education quality in secondary schools in Kahama District, Tanzania. *East African Journal of Education Studies, 7*(1), 216–230. https://doi.org/10.37284/eajes.7.1.1759

Tumwine, D., & Waiswa, M. (2025). From inspection to mentorship: Transforming supervision in East African education systems. *African Educational Research Journal, 13*(2), 101–110. https://carijournals.org/journals/AERJ/article/view/3074

United Republic of Tanzania. (2014). *Education and training policy*. Ministry of Education and Vocational Training. https://www.moe.go.tz/sites/default/files/EDUCATION%20AND%20TRAINING%20POLICY%202014%2C%202023%20EDITION.pdf

U-Sayee, C. R., & Adomako, E. B. (2021). Supervisory practices and challenges faced by senior high school principals in Greater Monrovia, Liberia: Implications for quality education. *Heliyon, 7*(4), e06895. https://doi.org/10.1016/j.heliyon.2021.e06895

Zickafoose, A., Ilesanmi, O., Diaz-Manrique, M., Adeyemi, A. E., Walumbe, B., Strong, R., Wingenbach, G., Rodriguez, M. T., & Dooley, K. (2024). Barriers and challenges affecting quality education (Sustainable Development Goal #4) in Sub-Saharan Africa by 2030. *Sustainability, 16*(7), 2657. https://doi.org/10.3390/su16072657

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Enhancing community engagement in conflict resolution among secondary school students in Sumbawanga Municipal Council, Tanzania

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ABSTRACT

This study examined the enhancement of community engagement in conflict resolution among secondary schools' students in Sumbawanga Municipal Council. Specifically, the study focused on identifying the conflict resolution strategies utilized by the community in addressing conflicts, assessing the role of local community leaders in conflict resolution, and exploring the impact of community involvement on students' academic performance. The study employed Social Capital Theory (SCT). A qualitative approach utilizing case study design was utilized. The target population included students (class monitors), discipline teachers, and community leaders, from whom 20 participants were picked purposively for interviews. Further, data were thematically analyzed. The findings revealed mediation, counseling, and dialogue were commonly used by the community to resolve student conflicts. Moreover, local leaders played a pivotal role in promoting peace and restoring relationships as well as strengthening collaboration among students at schools. On top of that, it was demonstrated that active community participation in conflict resolution positively influenced students' academic performance, as a conducive learning environment with fewer disruptions encouraged discipline. The study concludes that sustainability of conflict resolution requires active participation of competent stakeholders alongside school management. The study recommends strengthening school-community partnerships, capacity-building for community leaders for conflict management and policy support for community participation in academic settings.

Keywords: Community Engagement, Conflict Resolution, Secondary Schools Students, Sumbawanga Municipal Council, Tanzania

I. INTRODUCTION

Strengthening community participation in conflict resolution among secondary school students is a highly effective approach to foster peaceful, inclusive and resilient educational settings. The parents, local leaders and non-governmental organizations engagement helps in establishing a collective responsibility for students' welfare. Usually, during interactions people encounter conflicts, which can either help or hinder the achievement (Nukus, 2020). Though, conflicts are a normal part of daily life, need to be addressed quickly to ensure fairness and quality education settings. According to Elijah and Safiyanu, (2025) conflicts in organizations can slow down progress and success. Ngwama (2024) added that conflict can be disruptive, most institutions focus on managing and resolving it to keep things running smoothly and ensure good behavior among employees. Nonetheless, conflicts in education settings can harm the quality of education; therefore, the need for community participation in solving these conflicts is vital.

Instances worldwide underscore the importance of engaging various stakeholders, including the community, in implementing effective conflict resolution strategies to minimize their impact. Countries like the United States, particularly in California conflicts in education settings are a result of racial segregation, discrimination and prejudice (Mlay & Otieno, 2023). Peer Mediation program is useful at the Bronx High School of Science, where students facilitate discussions on topics like social cliques and academic pressures; molding a collaborative atmosphere while minimizing tensions (Nakata et al., 2025). In the UK, the Peer Mediation Program is famous at Harris Academy in Croydon, where trained student mediators help in resolving bullying and social dynamics; enhancing harmony and cooperation (Artyukhov et al., 2024). In the Netherlands, the Restorative Justice Schools project is significant, with institutions like Carmel College in Twente implementing for bringing together students, teachers, and parents to discuss conflicts for collective resolutions (Artyukhov et al., 2024). In India, the Bharat Scouts and Guides program has introduced a course on conflict resolution training in schools with cultural sensitivity (Lauwo & Mkulu, 2021).

In South African learning institutions, are driven by increased operating costs, rising fees due to inflation, and dwindling government funding (Lukman, 2021), these issues have led to serious unrest (Halevy & Cohen 2020). According to Lukman (2021) social disparities and cultural misunderstandings in Benin affect teaching and learning in educational settings. Similarly, differing perceptions, communication barriers, authority structures, and varying attitudes are contributing factors for conflicts in several Kenyan secondary schools (Kilonzo & Ivita, 2019). Like many other

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countries, the Tanzania landscape is not devoid of conflicts (Kisiangani et al., 2024; Ikhielea, 2024). Nonetheless, issues extend to both public and private secondary schools, with notable disputes affecting institutional stability as posed by Mlay and Otieno (2023) in the Morogoro. Similarly, Miah et al. (2024) noted tensions between teachers and parents in private secondary schools over the policy that mandates academically struggling students to repeat grades. Concurrently, Vinokur et al., (2024) pointed that, conflicts emerge from communication breakdowns, differing needs, values, ideas and power struggles. Organizational conflict in educational settings is a widespread issue (URT, 2002) and can arise from various sources, involving different people within and beyond the educational environment (Ngwama, 2024).

In Tanzania, change in curriculum and educational reforms lead to conflicts in education system (Kisiangani et al., 2024). Literature indicate that community stakeholders and teachers pose different views over changes in educational policies and curricula (Maeda, 2022). Despite the involvement of educational stakeholders to implement curricula changes for conflicts resolutions among students and enhancing the quality of teaching and learning (Paschal & Mkulu, 2020), the issues still persist. On top of that, most nonpublic secondary schools have implemented conflict resolution policies, though there is inadequate literature on the effectiveness of these mechanisms and their contribution on overall educational quality (Khalid & Xu, 2024). Without effective strategies to control and manage conflicts among secondary schools' students, the quality of education could be paralyzed. Therefore, this study intended to assess community participation in conflict resolution among public secondary schools' students in Tanzania, using Sumbawanga Municipal Council as a case study.

1.1 Statement of the Problem

The ongoing conflicts in most public secondary schools in Tanzania are disturbing issue that need urgent attention (Mlay & Otieno, 2023; Alex & Mukadi, 2022; Msangi, 2024). Usually, teachers use superficial solutions, namely punishment with a belief that conflicts should quickly be resolved to keep learning on track (Vinokur et al., 2024). This strategy does not consider the amplifying root causes of disagreements and disregards the complexities of these misunderstanding within the student emotional health. Despite government and stakeholders' efforts in fostering unity and compliance with disciplinary frameworks among students and teachers (Msangi, 2024), conflicts continue to harm the quality students. In addition, the inadequacies of empirical data on conflict settlement in education settings (Gomez et al., 2022) emphasize an important gap on the causes and the effectiveness of current resolution methods. At this juncture, the current study focused on assessing the community involvement in conflict resolution among public secondary schools' students in Sumbawanga Municipal Council in Tanzania.

1.2 Research Questions

i. What are conflict resolution strategies employed by the community to address conflicts among students in secondary schools?
ii. What are the roles of local community leaders in facilitating conflict resolution among students in secondary schools?
iii. What are the impacts of community involvement in conflict resolution on students' academic performance?

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Social Capital Theory (SCT)

A sociologist Pierre Bourdieu in the late 1970s introduced a Social Capital Theory (SCT), and in early 1980s, insisted the significance of social networks and relationships being an important asset to enable individuals and groups achieve their targets (Bakel & Horak, 2024). In the 1990s Robert Putnam strengthened the concept, notably in his influential work Bowling Alone: The Collapse and Revival of American Community in 1995) which he explored the demise of social capital in the United States of America and its effects on civic participation and community cohesion (Bakel & Horak, 2024). In the context of this study, SCT suggests that relationships, networks and norms of reciprocity serve as an important resource that enhance mutual understanding, collaboration, and the attainment of shared academic and social objectives.

SCT enhances community participation through relationships, networks, and trust that exist among students, teachers, families, and community stakeholders within and around the school settings (Cachón-Rodríguez et al., 2022). The theory highlights the importance of interpersonal networks and mutual trust in enhancing collaboration and social cohesion. Schools can use the concept to organize workshops and team-building activities in encouraging belonging, and interaction among students. Furthermore, strengthening connections between students, educators, parents, and community organizations influences collective responsibility (Bakel & Horak, 2024). Promoting engagement is significant, as involving diverse student groups in conflict resolution programs builds empathy and cross-cultural understanding (Tsounis & Xanthopoulou, 2024). Therefore, collaborative projects, mixed-group discussions, and

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partnerships that reflect varied cultural backgrounds help students in a great extent to appreciate diversity while working together for common goals (Horak & Paik, 2022).

2.2 Empirical Review

2.2.1 Conflict Resolution Strategies Employed by the Community to Address Conflicts

Malingumu (2022) assessed disagreements management styles in Tanzanian secondary schools and found that school authorities usually resolve disagreements through disciplinary committees in combination with guidance and counselling sessions. Similarly, Msangi (2024) observed that meetings, negotiations, and the involvement of experienced staff members played a key role in conflict resolution; while communication skills showed little impact, collaboration and problem-solving abilities were significantly associated to successful outcomes. Weber (2020) emphasized the effectiveness of community-building interventions such as peer mediation and emotional intelligence training in reducing student conflicts. Correspondingly, Rahayu (2021) identified group assignment disputes and bullying as the most prevalent forms of conflict, with peer mediation and teacher intervention commonly applied.

Amedome et al. (2024) further noted that interpersonal and academic-related conflicts were the most widespread, whereas violent incidents, including those involving weapons, were comparatively rare. Similarly, Maeda (2022) found that the most commonly used conflict resolution strategies included compromise, accommodation, and formal meetings aimed at settling disputes. In a broader context, Rozmus (2017) peer mediation programs are effective in addressing conflicts, it also raised ethical concerns about the appropriateness of students serving as mediators. Supporting this view, Mlay and Otieno (2023) argued that effective conflict resolution mechanisms help establish a disciplined, inclusive, and well-coordinated learning environment that encourages stakeholder collaboration and enhances educational quality. Conversely, Khalid and Xu (2024) reported that persistent conflicts often stemmed from the absence of a standardised resolution framework, with schools instead relying on ad hoc methods that lacked consistency and suitability to the specific nature of each conflict.

2.2.2 Role of Local Community Leaders in Facilitating Conflict Resolution among Students

Lubbungu and Siame (2025) argued that proverbs serve as powerful tools for conflict resolution, playing a vital role in promoting peaceful coexistence, fostering mutual understanding, and maintaining social harmony. Traditional leaders, when mediating disputes, should adopt a complementary rather than competitive approach, distinguishing traditional methods from formal conflict resolution systems. Moran et al. (2024) reported that restorative practices help de-escalate conflicts, enhance student voice and accountability, and foster a culture of relational repair within schools. Effective implementation often involves collaboration with parents, faith leaders, and community mediators, although much of the evidence is based on teacher self-reports and limited in geographic scope. Likewise, Hakvoort (2022) demonstrated that peer mediation and school-wide conflict resolution programmes can reduce bullying and interpersonal disputes when implemented comprehensively combining training, supervision, and curriculum integration and when supported by adults such as community leaders, parents, and faith figures who reinforce positive norms beyond school settings. Similarly, Driessen's (2025) review revealed that religious leaders and elders often act as trusted mediators, leveraging moral authority and community values to build trust and foster reconciliation, particularly in contexts where faith holds significant social influence. Platforms such as interfaith councils and local religious networks can also play an important role in preventing and mediating conflicts.

Similarly, Cipriano et al. (2024) reported that numerous studies, predominantly from the United States, demonstrated that Social and Emotional Learning (SEL) programmes consistently led to small-to-moderate reductions in aggressive behaviour and improvements in social skills, emotional regulation, and peer relationships outcomes that significantly support conflict resolution among students. The impact on behaviour was found to be greater when SEL initiatives were integrated with community or parental engagement. Enwereji and Uwizeyimana (2020), in the White Paper on Traditional Leadership and Governance, noted that traditional leaders are mandated to bridge the gap between customary justice systems and modern judicial frameworks while upholding national legislation and the South African Constitution. They also possess the authority to resolve tribal disputes through customary courts before such cases advance to local or provincial courts. Furthermore, traditional leaders contribute to maintaining peace and security by participating in community policing and developing strategies to reduce theft, robbery, and conflicts. Momoh (2021) highlighted the recognition within the Mende community of the essential role traditional leaders play in reconciling disputing parties and restoring social harmony. In a related study, Momoh (2019) emphasised that elders facilitate three key processes of conflict management and prevention negotiation, mediation, and adjudication which typically occur in an informal and amicable setting designed to build trust between conflicting parties and the mediating authorities.

2.1.3 Impact of Community Involvement in Conflict Resolution Academic Performance

Nguyen et al. (2022) investigated conflict resolution in Ghanaian senior high schools using a descriptive research design that collected data from 43 schools across the Ashanti Region. Their findings revealed that effective conflict management enhances school performance, improves outcomes, and boosts overall institutional efficiency.

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Similarly, Wike, (2025) observed that conflicts straining student-teacher relationships, making it challenging to restore positive interactions and adversely affecting students' academic performance, especially when learning resources such as desks and books are damaged. Moran (2024) reported that teachers frequently noted better classroom relationships, reduced suspensions, and greater student engagement following the introduction of restorative practices, which they associated with improved learning conditions and academic potential. Darling-Hammond et al. (2023) further demonstrated that large administrative datasets can capture system-level impacts when implementation is consistent, though direct effects on academic achievement are often modest or inconsistent due to challenges in measuring fidelity, reliance on proxy indicators, and potential confounding from simultaneous reforms.

Lešková and Haburajová Ilavská (2023) found that both students and staff experienced enhanced conflict resolution skills, fewer recurring minor disputes, and a stronger sense of agency and belonging, contributing to improved engagement and learning outcomes. Pre- and post-intervention evaluations also showed increases in instructional time and reductions in classroom disruptions, suggesting indirect academic benefits. Likewise, Alex and Mukadi (2022) reported that effective conflict resolution strategies foster peace, strengthen teamwork, improve job and academic performance, support teacher retention, and enhance problem-solving within educational settings. Mlay and Otieno (2023) observed that the effective implementation of conflict resolution mechanisms enables schools to establish well-coordinated, disciplined, and inclusive learning environments that encourage collaboration among stakeholders and enhance overall educational quality. Hakvoort (2022) provided consistent evidence that conflict resolution and peer mediation programs improve students' social and behavioural outcomes by reducing incidents and enhancing interpersonal skills, although direct effects on academic performance were less consistent, with positive impacts largely occurring indirectly through better engagement and fewer classroom disruptions.

III.METHODOLOGY

3.1 Area and Population of Study

Sumbawanga Municipality was chosen as the study area due to its location as the researcher' working place. Also, the municipal council encounter various challenges related to conflict resolution within schools, which presents an opportunity to examine the role of local communities in addressing and resolving conflicts in school settings. The study population included community leaders, teachers and students effectively involved in assessing community engagement in conflict resolution among secondary school students in the Sumbawanga Municipal Council.

3.2 Research Approach and Design

The study employed a qualitative approach that helped a researcher for an in-depth understanding, comprehensive data gathering and analysis, ultimately leading to a robust conclusion. Further, this research adopted a case study design, which provide an in-depth, contextual understanding of the intricate factors that influence community engagement and conflict resolution. Further, this design allowed a researcher to investigate the specific nuances of individual communities, schools, and interactions, uncovering insights that may be overlooked in broader quantitative studies.

3.3 Sample Size and Sampling Techniques

This study utilized purposive sampling, where key informants were deliberately selected from five secondary schools to ensure their relevance and expertise. This study used 20 key informants were selected purposively among the target population. Specifically, one class monitor and two discipline teachers from each of five secondary schools; Katuma, Kizwite, Mazwi, Chanji and Mtipe. Two community leaders from each secondary school. This targeted approach ensures valuable input from individuals with firsthand experience in school and community life.

3.4 Data Collection and Analysis Procedures

Data collected through interview were recorded, transcribed immediately and the transcripts were shared with respondents for validation and correction if necessary. The data were then edited, summarized and presented narratively. A thematic content analysis was conducted on the qualitative data obtained through semi-structured interviews, with results summarized into narratives. The findings were triangulated after the presentation and discussion of responses for each research question to ensure validity.

3.6 Ethical Consideration

The researcher prioritized consent, confidentiality, privacy and anonymity throughout the study. Strict adherence to research ethics, policies and a code of conduct was maintained during the entire research process. To facilitate data acquisition, the researcher arranged the necessary logistics, including obtaining a data collection clearance letter from the administration of the University of Iringa. This letter was submitted to the research site to secure permission for conducting the study in the designated area. Additionally, the researcher properly acknowledged all

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relevant literature sources to avoid plagiarism and ensure that data collection is accurate, with no unauthorized alterations, to prevent manipulation of results.

IV. FINDINGS & DISCUSSION

4.1 Results Overview

This study focused on enhancing community engagement in conflict resolution among students within secondary schools in Sumbawanga Municipal Council, Tanzania. The community leaders 5 (25%), teachers 5 (25%) and class monitors 10 (50%) were interrogated through threefold: to identify the conflict resolution strategies employed by the community in addressing conflicts among students, to examine the role of local community leaders in facilitating conflict resolution, and to explore the impact of community involvement on students' academic performance.

4.2 Conflict Resolution Strategies Employed by the Community

The findings from respondents were dialogue and mediation through **e**lders, teachers, or community leaders, disciplinary committees and school boards, peer mediation and counseling, involving religious leaders, parental and guardian. Class monitor**s** had this to say; "Most communities utilize dialogue and Mediation through elders, teachers, or community leaders' help in remedying conflicting students. Involving disciplinary committees and school boards facilitate listening and suggest solutions from warnings to reconciliation" (Class monitor**s**, Interview Session, 24-26/07/ 2025). The findings imply that conflict resolution in schools is viewed as a shared responsibility, where elders, community leaders and school governance structures work alongside teachers and administrators, emphasizing that discipline are a collective effort. It also reflects a restorative focus, as the use of dialogue, mediation, warnings, and reconciliation prioritizes repairing relationships and fostering harmony rather than relying solely on punitive measures**.**

The findings align with Bos (2024), who emphasized that curricula should be structured to enhance conflict management strategies and encourage constructive dialogue among peers sharing common spaces. In contrast, Khalid and Xu (2024). Instead, conflict resolution was often handled through ad hoc approaches, which lacked consistency and were poorly aligned with the specific nature of disputes without a universally accepted resolution framework. Peer mediation and counseling in certain situations, peer-to-peer approaches are encouraged to resolve conflicts, helping to reduce students' fear of authority figures. Religious leaders, parents, and guardians, their involvement supports guidance and moral direction with cultural variations (Nakata et al., 2025). This challenges one-size-fits-all community strategies, showing that culturally diverse students may prefer different resolution approaches meaning interventions ignoring cultural dimensions may be ineffective.

Discipline Teachers emphasized that;

> "*The importance of peer mediation and counseling, where students are trained to help resolve conflicts among themselves. In certain situations, peer-to-peer solutions are encouraged to minimize students' fear of authority and promote openness. Additionally, parents, guardians, and religious leaders are involved in discussions about children's behavior to propose collective solutions. Religious leaders and elders play a vital role in offering moral and spiritual guidance, fostering respect, forgiveness, and peaceful coexistence. Disciplinary committees are also engaged to hear cases and recommend collective resolutions*" (Discipline Teachers, Interview Session, 24-26/07/ 2025).

This approach implies that student's discipline is managed through a holistic, community-centered model that integrates peer support, family involvement, spiritual guidance, and institutional structures. This involves peer mediation with input from parents, elders, and committees, schools that create a balanced system that addresses misconduct and builds moral values. Complexly, Malingumu (2022) cemented that professional conflict management including collaboration, compromising and occasionally accommodating were the most commonly employed strategies. The findings aligned with Msangi (2024) that, while communication skills alone did not have a significant impact on conflict resolution, collaborative and problem-solving skills were positively associated with successful outcomes. Similarly, Rahayu (2021) concurs that conflicts such as group assignment disputes and bullying were common, and that peer mediation and teacher involvement were often used to address them. Rozmus (2017) also showed that peer mediation programs can work well in solving conflicts but raised ethical concerns about whether students should act as mediators. Further, Amedome et al. (2024) emphasized the importance of comprehensive, culturally sensitive conflict resolution programs that are tailored to the specific socio-cultural and educational context of the Volta Region. In similar vein, Hai District of the Kilimanjaro Region in Tanzania, Maeda (2022) indicated that commonly used strategies included compromising, accommodating, and conducting meetings to resolve conflicts.

Community Leaders perceived that;

> "*Parents and guardians are actively discuss about their children's behavior, where they work together with schools to propose collective solutions that strengthen accountability both at home and in school. In addition, religious leaders and elders are involved to provide moral and spiritual guidance, helping*

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students cultivate values of respect, forgiveness, and peaceful coexistence" (Community Leaders, Interview Session, 24-26/07/ 2025).

This approach implies that effective discipline and character formation extend beyond the school setting and require strong collaboration with families and community leaders. Findings were supported by Bakel & Horak, (2024) who established that bridging connections among students, teachers, parents and local organizations through forums, councils and committees can improve communication and collaboration. Further, involving diverse student groups in conflict resolution efforts; mixed-group discussions or collaborative projects reflecting various cultural perspectives, cultivates empathy, understanding in collective problem-solving as suggested by Horak and Paik (2022). Weber (2020) highlighted the value of community-building strategies involving peer mediation and emotional intelligence training conflicts resolutions. Apipalakul at al. (2017) built that greater community involvement leads to more effective conflict management and empowerment. According to Cachón-Rodríguez et al. (2022), enhancing conflict resolution using this framework involves tapping into the trust, connections, and relationships present within schools and their surrounding communities.

4.3 Role of Local Community Leaders in Facilitating Conflict Resolution among Students

The second objective demanded the researcher to uncover the roles of local community leaders in facilitating conflict resolution among students in secondary schools. In Tanzania, these leaders include ward and village executives, school board members, religious leaders, elders and respected cultural figures bare a certain authority within communities. It was found that, community leaders promote cultural and moral values, mediation and dialogue facilitation, encourage restorative justice and reconciliation instead of relying only on punishment, parental and community engagement and enhancing school discipline structures.

Class monitors Role of Local Community Leaders in Facilitating Conflict Resolution among students shown the emphasis that "Cultural and moral values are promoted through deliberate teachings that aim to instill respect, forgiveness, cooperation, tolerance, and discipline among students" (Class monitors, Interview Session, 24-26/07/2025). This implies that discipline in schools is concerned with behavior controlling and shaping character and nurturing responsible citizens. Consistently, Momoh (2019) highlights that elders facilitate three main processes of conflict management and prevention negotiation, mediation, and adjudication typically conducted in a friendly, informal atmosphere intended to build trust between conflicting parties and authority figures. Similarly, Lubbungu and Siame (2025) report that restorative justice and restorative practices correlate with reductions in suspensions and exclusions, improved relationships, and positive changes in student behaviour and school climate, although effects vary according to program model and implementation. However, Chandolia and Anastasiou (2020) concludes that leadership competence and conflict-management approaches within the school, rather than the involvement of external or local community leaders, are the primary determinants of successful conflict resolution.

Based on role of local community leaders in facilitating conflict resolution among students Discipline Teachers view that;

> "Mediation and dialogue facilitation *involve leaders serving as neutral mediators between students, teachers, and parents during disputes, creating a platform for open discussion and perspective sharing to ease tensions. This approach emphasizes restorative justice and reconciliation, where offenders are encouraged to take responsibility, apologize, and repair damaged relationships rather than face punishment alone.* Parental and community engagement *further strengthens this process by mobilizing parents and guardians to actively participate in addressing conflicts involving their children*" (Discipline Teachers, Interview Session, 24-26/07/2025).

The findings imply that discipline and conflict resolution in schools are shifting from punitive approaches toward inclusive, restorative practices that build accountability and stronger relationships. The involvement of parents and community members reinforces collective conflict resolution while fostering trust, empathy and harmony among all stakeholders**.** Similarly, Enwereji and Uwizeyimana (2020) emphasize that elders are empowered to bridge the gap between traditional justice practices and modern judicial systems, while upholding national legislation and constitutional provisions, as exemplified in South Africa. Also, Momoh (2021), who observed that the Mende people of Sierra Leone recognize the critical role traditional leaders' play in reconciling conflicting parties and restoring social harmony. Concurrently, Moran (2024) adds that teachers perceive restorative approaches as effective in de-escalating conflicts, amplifying student voice and accountability, and shifting school culture toward relational repair particularly when implemented alongside collaboration with parents, faith leaders, or community mediators.

Similarly, community leaders; elders and religious figures play a pivotal role in resolving student conflicts by acting as impartial mediators (Cachón-Rodríguez et al., 2022). Their involvement often results in quicker resolutions and is positively perceived by students, hence bringing cultural relevance and trust in local customs and values to the effectiveness of conflict resolution. In addition, social and emotional learning (SEL) programs produce consistent small-to-moderate reductions in aggressive behaviour and improvements in social skills, emotional regulation, and peer relationships outcomes that support student conflict resolution (Cipriano et al., 2024).

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Community Leaders on the role of local community leaders in facilitating conflict resolution among students provided that;

> "*Enhancing school discipline structures involves leaders working hand-in-hand with the community through disciplinary committees and school boards to provide guidance and ensure consistent enforcement of school rules in resolving conflicts. At the same time, cultural and moral values are promoted through deliberate teachings that cultivate respect, forgiveness, cooperation, tolerance, and discipline among students*" (Community Leaders, Interview Session, 24-26/07/2025).

This implies that effective conflict resolution and discipline in schools require both structural mechanisms and value-based education. While committees and boards ensure fairness and consistency in applying rules, the integration of cultural and moral teachings addresses the root causes of misbehavior by shaping students' attitudes and character. Together, these approaches strengthen accountability, foster peaceful coexistence, and contribute to a more harmonious learning environment. Driessen (2025) similarly observes that religious leadership platforms and elders frequently act as trusted mediators and interfaith councils and local prevent and mediate conflicts. Further, peer mediation and school-wide conflict resolution programs reduce bullying and interpersonal conflict when they are comprehensive incorporating training, supervision, and curriculum integration and supported by adult stakeholders (Hakvoort, 2022). In their qualitative research Lubbungu and Siame (2025) underpinned that proverbs play a critical role in promoting peaceful coexistence, fostering understanding, and maintaining social harmony. Further findings in the similar study established that proverbs were powerfully utilized in resolving conflicts in a culturally appropriate way, and they are highly valued by the Tonga people in communicating complex ideas and emotions. Concurrently, Enwereji and Uwizeyimana (2020) cemented that elders are empowered to bridge the gap between traditional justice practices and modern judicial systems while upholding national legislation and the South African Constitution.

4.4 Impacts of Community Involvement in Conflict Resolution on Academic Performance

In this section, the researcher examined the positive impact of community involvement in conflict resolution on students' academic performance. The findings insisted on key benefits, including the creation of a more conducive learning environment, a reduction in absenteeism, the promotion of safer school settings, enhanced socio-emotional wellbeing, and increased accountability among educational stakeholders.

> "*Class monitors shared their perspectives, emphasizing that an improved learning environment was fostered through the active engagement of parents, community leaders, and elders who collaboratively addressed conflicts. This approach led to fewer disruptions and reduced truancy. Furthermore, they noted that conflict resolution efforts strengthened relationships among teachers, students, and parents, particularly through the involvement of community leaders and parental participation*" (Class Monitors, Interview Session, 24-26/07/2025).

The findings imply that community leaders and parents' involvement in conflict resolution fosters stronger bonds between teachers, students, and parents as it promotes shared responsibility. These perceptions align with the findings of Mlay and Otieno (2023), who reported that effective conflict resolution mechanisms foster a well-coordinated, disciplined, and inclusive learning environment, enhance stakeholder's collaboration and ultimately improve the quality of education. In a related study, Kilonzo and Ivita (2019) established that efficient conflict resolution leads to improved performance and better outcomes, enhancing overall efficiency within the school system. On the other hand, conflicts negatively impact students' academic performance, particularly when learning resources, such as desks and books, are damaged. Moreover, conflicts strain student-teacher relationships, making it difficult to restore positive dynamics including learning (Nguyen et al., 2022; Wike, (2025). However, it's not consistent that, while community involvement improves social harmony, it must directly result into measurable academic performance outcomes**.** Improvements in relationships do not always result in higher test scores or school completion.

In their view, Discipline Teachers pointed that;

> "*Reduced dropouts and truancy are linked with community-driven mediation and support systems which influence reconciliation and reintegration of conflicted students into school. Conflict management which involves community elders and parents help consolidate the relationships between teachers, students, and families. Community-led programs also restore discipline and accountability, as students are guided to take responsibility for their actions while staying engaged in learning, rather than being suspended*" (Discipline Teachers, Interview Session, 24-26/07/2025).

Findings imply that community-based mediation plays a vital role in reducing truancy and dropout rates by offering students second chances, thereby minimizing school exclusions and ensuring their continued access to education. At the same time, the involvement of parents and community leaders in discipline matters helps to strengthen school community relationships by building trust and collaboration, ultimately creating a more supportive environment for both teachers and learners. Findings were supported by Nguyen, et al. (2022) who revealed that efficient conflict resolution leads to improved performance outcomes and enhanced overall school system. The implementation of restorative initiatives enhances classroom relationships, reduces suspensions and increases student participation which

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indirectly support academic performance (Moran, 2024). Similarly, the well-implemented restorative programs are correlated to decreased suspensions and improved school conducive learning climate as supported by Darling-Hammond et al. (2023). On the other hand, Brück et al. (2017) linked conflict with certain negative impact on students' academic performance. Further studies emphasize that school-based factors namely teacher competence, leadership style, curriculum, and pedagogy are stronger predictors of academic performance than external community participation in conflict resolution (Chandolia & Anastasiou, 2020). Globally, community conflict-resolution initiatives are not effectively reliable; mostly their impact vary according to the context, and in some cases traditional leaders do not have legitimacy to settle education related disputes. This undermines the assumption that community involvement will consistently enhance academic outcomes.

Community leaders have observed that

> "*Constructive disputes management promotes positive social and emotional development among students, fostering forgiveness, respect, empathy, and cooperation, while also enhancing memory retention and classroom participation. Through conflict management, the inclusive education is fairly and equitably encouraged for all students. Moreover, knowing that conflicts are handled fairly and supportively strengthens students' sense of belonging and safety, which contributes to long-term academic motivation*" (Community Leaders, Interview Session, 24-26/07/2025).

Findings imply that community-led conflict management addresses behavioral huddles and supports holistic student learning participation and performance outcomes. Through emotional well-being, inclusivity, and a safe learning atmosphere, such practices enhance the overall effectiveness of education in the school. Supporting these findings, Alex and Mukadi (2022) reported that effective conflict resolution strategies positively impact school management and so enhancing academic and job performance. Usually, conflict mediation training and the use of information technology in conflict resolution reduce tensions and enhances a harmonious learning environment. Similarly, Hakvoort (2022) found consistent evidence that conflict-management and peer mediation initiatives improve social and behavioral outcomes, such as reducing incidents and enhancing social skills. Though, evidence for significant academic success is less consistent; positive effects are generally indirect through increased students' participation and reduced classroom disruptions and are strongest when these initiatives are combined into broader school improvement efforts. These findings support the argument that involving community leaders in conflict resolution is crucial for mitigating challenges and enhancing students' academic performance. Additionally, Mlay and Otieno, (2023) revealed that effective management of conflicts help overall academic performance and efficiency. According to Wike (2025) conflicts strain student-teacher harmonious relationships, making it difficult to restore good interactions and adversely affecting students' academic outcomes, particularly when learning resources are damaged.

Building on the Social Capital Theory, it was revealed the importance social interconnectedness, trust, and collaboration among parents, teachers and community members, which in turn contribute to effective conflict resolution in schools and influences students' academic success. According to Ndijuye (2022), when communities engage in managing conflicts, they create good learning atmosphere that minimizes disruptions, reduces stress, and promotes harmonious student-teacher relationships, all of which influence academic success. The use of social ties and collective responsibility, help students to benefit from reliable stakeholders' guidance and shared norms that shape discipline and promotes learning achievements. Moreover, citing Tanzania as case study, in the Social Capital Theory point of view, Ndijuye (2022) indicates a pivotal role played by teachers and parents than community leaders in molding student's conflict-resolution skills and influencing academic success; hence highlighting that external community participation may overstate its actual contribution to learning achievement. Promoting engagement is significant, as involving diverse student groups in conflict resolution programs builds empathy and cross-cultural understanding (Tsounis & Xanthopoulou, 2024). Therefore, collaborative projects, mixed-group discussions, and partnerships that reflect varied cultural backgrounds help students in a great extent to appreciate diversity while working together for common goals (Horak & Paik, 2022).

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Collectively, the strategies used illustrate a multi-stakeholder commitment to conflict resolution among secondary schools' students. These included dialogue and mediation facilitated by elders, teachers and community leaders; disciplinary measures implemented through school boards and committees; peer-led mediation and counselling programs; involvement of religious leaders; and active participation by parents and guardians. The efficiency of these initiatives, was found to vary mainly depending on the nature of the conflict and the level of collaboration among stakeholders as well as leadership. Further, the involvement of disciplinary committees, restorative justice initiatives and school community forums enables the development and implementation of culturally responsive conflict resolution strategies. Local community leaders play a crucial role in this process, serving as mediators and advisors as well as vital connectors. Their participation helps in building understanding and strengthen collaborative efforts in managing student

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conflicts. The active collaboration of parents, local leaders, and community organizations plays a significant role in mitigating disruptive behaviours, reinforcing disciplinary standards, and strengthening relationships between students and teachers. These efforts collectively foster a good learning atmosphere that is more conducive to academic success. Therefore, community participation in conflict resolution is central in promoting students' academic success as it cultivates a harmonious learning atmosphere.

In conclusion, the study on enhancing community involvement in conflict resolution among secondary schools' students in Sumbawanga Municipal Council, Tanzania, stress on the vital role of community participation in cultivating peaceful and supportive learning environments. The findings revealed that various conflict resolution strategies namely mediation, counselling, and negotiation are routinely employed by community members and local leaders to address student disputes. Traditional elders, religious figures, and ward education officers emerged as key actors in bridging the schools and the community, thereby building trust and mutual understanding. Furthermore, the study demonstrated that active community participation in conflict resolution contributes to students' academic performance as a result of minimized disruptions, restored social cohesion, and promoting effective learning environment. Ultimately, the research emphasizes the effective stakeholders (teachers, families and community leaders) involvement in conflict management to ensure sustainability and enhancing better educational outcomes.

5.2 Recommendations

Cultural and traditional conflict resolution mechanisms must be meaningfully integrated into school practices by honouring respected local customs of reconciliation particularly mediation led by elders. Embedding such culturally grounded strategies within formal education systems strengthens the relevance and effectiveness of conflict management, ensuring that solutions resonate with the lived experiences of students and their communities. Also, there should be strengthened collaboration between educational institutions and the wider community. This can be achieved by investing in capacity building for community leaders and teachers through structured, regular dialogue forums.

Monitoring and evaluation mechanisms should be put in place at district and municipal levels to assess how schools are engaging communities in conflict resolution and their impact on student behavior and academic performance. In addition, government support and targeted funding for training programs, workshops, and community forums are essential for strengthening school-community engagement in conflict resolution practices. Such investment facilitates the development of local capacity, promotes collaborative problem-solving, and ensures the implementation of sustainable, contextually relevant strategies.

REFERENCES

Alex, A., & Mukadi, M. (2022). Effectiveness of conflict resolution strategies in a public secondary schools' management in Morogoro municipality in Tanzania. *Asian Journal of Education and Social Studies, 32*(2), 1–8. https://doi.org/10.9734/AJESS/2022/v32i230763

Amedome, S. N., Ilfiandra, & Suherman, U. (2024). Understanding and resolving student conflicts: Perspectives and strategies in senior high schools across the Volta Region of Ghana. *Conflict Resolution Quarterly, 42*(2), 289–305.

Apipalakul, C., Jaimooka, E., & Ngang, T. K. (2017). The effect of community participation on conflict management. *Global Journal of Sociology: Current Issues, 7*(2), 95–103. https://doi.org/10.18844/gjs.v7i2.2394

Artyukhov, A., Lapidus, A., Yeremenko, O., Artyukhova, N., & Churikanova, O. (2024). Educational resilience through the armed conflicts: A bibliometric analysis. *Business Ethics and Leadership, 8*(2), 164–183. http://doi.org/10.61093/bel.8(2).164-183.2024

Bakel, M., & Horak, S. (2024). Social capital theory (pp. 261–267). In K. Hutchings, S. Michailova, & A. Wilkinson (Eds.), *A guide to key theories for human resource management research*. Cheltenham: Edward Elgar. https://doi.org/10.4337/9781035308767.ch33

Bos, L. A. (2024). Developing conflict resolution skills in residential students at higher education institutions (Master's culminating experience project No. 470). San José State University. https://scholarworks.sjsu.edu/etd_projects/470

Brück, T., Di Maio, M., & Miaari, S. H. (2019). Learning the hard way: The effect of violent conflict on student academic achievement. *Journal of the European Economic Association, 17*(5), 1502–1537. https://doi.org/10.1093/jeea/jvy051

Cachón-Rodríguez, G., Blanco-González, A., Prado-Román, C., & Del-Castillo-Feito, C. (2022). How sustainable human resources management helps in the evaluation and planning of employee loyalty and retention: Can social capital make a difference? *Evaluation and Program Planning, 95*(1), 102171. https://doi.org/10.1016/j.evalprogplan.2022.102171

Licensed Under Creative Commons Attribution (CC BY-NC)

Chandolia, E., & Anastasiou, S. (2020). Leadership and conflict management style are associated with the effectiveness of school conflict management in the Region of Epirus, NW Greece. *European Journal of Investigation in Health, Psychology and Education, 10*(1), 455–468. https://doi.org/10.3390/ejihpe10010034

Cipriano, C., Ha, C., Wood, M., Sehgal, K., Ahmad, E., & McCarthy, M. F. (2024). A systematic review and meta-analysis of the effects of universal school-based SEL programs in the United States: Considerations for marginalized students. *Social and Emotional Learning: Research, Practice, and Policy, 3*(1), 100029. https://doi.org/10.1016/j.sel.2024.100029

Darling-Hammond, L., Podolsky, A., Melnick, H., & Burns, D. (2023). Measuring restorative practices to support student wellbeing and outcomes [Policy report]. EdPolicyCA. https://edpolicyinca.org/publications/measuring-restorative-practices-support-student-wellbeing-and-outcomes

Driessen, M. D. (2025). Interreligious dialogue, conflict resolution and peacebuilding: A review. *Religions, 16*(2), Article 150.

Elijah, Z. O., & Safiyanu, S. S. (2025). Conflict management strategies and organizational performance in selected public tertiary institutions in Nasarawa State, Nigeria. *International Journal of Educational Research and Development, 7*(8), 112–125. https://doi.org/10.70382/nijerd.v7i8.013

Enwereji, P. C., & Uwizeyimana, D. (2020). Engaging traditional leaders in municipal governance: The case of South African municipalities. *Indilinga African Journal of Indigenous Knowledge Systems, 19*(1), 126–140.

Gomez, R. D., Yazon, A. D., Buenvinida, L. P., Tan, C. S., & Bandoy, M. M. (2022). School head's conflict resolution skills, organizational school climate, and teacher work engagement in the new normal. *International Journal of Management, Entrepreneurship, Social Science and Humanities, 5*(2), 127–146.

Hakvoort, I. (2022). Research from 1996 to 2019 on school-wide conflict resolution and peer mediation: A synthesis. *Intervention in School and Clinic / Education Review.* Taylor & Francis Online.

Halevy, N., & Cohen, T. R. (2020). Intergroup conflict. *Negotiation and Conflict Management Research, 12*(2), 161–173.

Horak, S., & Paik, Y. (2022). Informal network context: Deepening the knowledge and extending the boundaries of social network research in international human resource management. *The International Journal of Human Resource Management, 34*(12), 2367–2403. https://doi.org/10.1080/09585192.2022.2090268

Ikhielea, U. E. (2024). Challenges and strategies of conflict management in secondary schools. *Benin Journal of Educational Studies, 29*(1–2), 1–7.

Khalid, H., & Xu, Q. (2024). Examining conflict management strategies used in Tanzania's secondary schools: A case in Biharamulo District, Tanzania. *Asian Journal of Education and Social Studies, 50*(5), 583–597.

Kilonzo, P. K., & Ivita, M. M. (2019). Causes of conflict in public secondary schools in Mukaa Sub County, Makueni County. *IOSR Journal of Research & Method in Education, 9*(4, Ser. I), 1–15.

Kisiangani, M. N., Kutto, V. C., & Tallam, E. (2024). Communication approaches used in conflict management in national high schools in North Rift Counties of Kenya and implications on institutional stability. *Journal of African Interdisciplinary Studies, 8*(6), 134–151.

Lauwo, H., & Mkulu, D. G. (2021). Challenges facing community involvement in ensuring quality education in public secondary schools in Meru District, Arusha Region–Tanzania. *International Journal of English Literature and Social Sciences, 6*(1), 15–23.

Lešková, L., & Haburajová Ilavská, L. (2023). Peer mediation as a means of eliminating conflict in the school environment. *Journal of Education Culture and Society, 14*(1), 161–184. https://doi.org/10.15503/jecs2023.1.161.184

Lubbungu, J., & Siame, P. (2025). Proverbs: A conflict management tool among the Tonga people of Southern Zambia. *Conflict Prevention and Peace Management, 34*(1), 145–156.

Lukman, Y. (2021). Managing conflict at institutions of higher learning: A post-positivist perspective [Master's thesis, Walter Sisulu University]. Walter Sisulu University Repository.

Maeda, D. S. (2022). Conflict management approaches practiced by public heads of secondary schools and teachers in Hai District [Master's thesis, The Aga Khan University]. The Aga Khan University Repository.

Malingumu, W. S. (2022). Conflicts and conflict management styles in secondary schools in Tanzania: Perceptions of employees. *Journal of Issues and Practice in Education, 14*(2), 50–64. https://doi.org/10.61538/jipe.v14i2.1215

Miah, M. A. A., Chandna, J., & Gurung, R. (2024). Every Newborn – Reach Up Early Education Intervention for All Children (EN REACH): A parent group intervention for school readiness in Bangladesh, Nepal and Tanzania: Study protocol for a cluster randomised controlled trial. *Trials, 25*(1), 556. https://doi.org/10.1186/s13063-024-08381-6

Mlay, G., & Otieno, K. O. (2023). Conflict resolution mechanisms and their influence on quality education in private secondary schools in Arusha District Council. *Journal of Research Innovation and Implications in Education, 7*(3), 201–212.

Licensed Under Creative Commons Attribution (CC BY-NC)

Momoh, H. B. (2019). Bringing the old back in: Retraditionalizing the institution of chieftaincy in the modern state governance of Sierra Leone. *International Journal of Sciences: Basic and Applied Research, 48*(2), 68–88. https://www.gssrr.org/JournalOfBasicAndApplied/article/view/10032

Momoh, H. B. (2021). The role of traditional leaders in peacemaking and conflict management among the Mende of Sierra Leone. *International Journal of Sciences: Basic and Applied Research, 55*(2), 156–171.

Moran, E., Sloan, S., Walsh, E., & Taylor, L. K. (2024). Exploring restorative practices: Teachers' experiences with early adolescents [Systematic review]. *International Journal of Educational Research Open, 6*(1), 100323. https://doi.org/10.1016/j.ijedro.2024.100323

Msangi, D. D. (2024). Head teachers' leadership strategies for conflict resolution in primary schools at Kondoa District. *Journal of Issues and Practices in Education, 16*(2), 248–263.

Nakata, A., Vuopala, E., & Weinberger, A. (2025). Conflict experiences and management strategies in intercultural collaborative learning. *Research in Comparative and International Education, 20*(2), 291–313. https://doi.org/10.1177/17454999251329258

Ndijuye, L. G. (2022). Developing conflict resolution skills among pre-primary children: Views and practices of naturalized refugee parents and teachers in Tanzania. *Global Studies of Childhood, 12*(2), 159–169.

Nguyen, T., Le, H., & Tran, P. (2022). Community involvement in school management: Enhancing educational outcomes. *International Journal of Education Policy, 18*(2), 102–118.

Ngwama, C. (2024). Effects of community participation on school infrastructure development in rural Uganda. *African Journal of Education and Practice, 9*(2), 1–12.

Nukus, K. B. (2020). Conflict management practices in secondary schools in Limmu Woreda government secondary schools of East Wollega Zone, Ethiopia (Unpublished master's thesis). Addis Ababa University.

Paschal, M., & Mkulu, D. (2020). Teacher–student relationship and students' academic performance in public secondary schools in Mwanza. *Tanzania Journal of Research in Education and Society, 11*(1), 20–23.

Rahayu, G. D. S. (2021). An investigation of conflict resolution strategies for online learning during the COVID-19 pandemic. *Journal of Educational Technology, 8*(2), 123–135.

Rozmus, K. (2017). Peer mediation programs in schools: Resolving classroom conflict but raising ethical concerns. *Journal of Law and Education, 26*(2), 123–135. https://doi.org/10.2307/42761383

Tsounis, A., & Xanthopoulou, D. (2024). Social capital theory: A review. In S. Papagiannidis (Ed.), *TheoryHub Book*. https://open.ncl.ac.uk/ ISBN: 9781739604400

URT. (2002). Government notice No. 295 of 2002. *Tanzania Laws and Government Regulations*. Dar es Salaam.

Vinokur, E., Yomtovian, A., Marom, M. S., Itzchakov, G., & Baron, L. (2024). Social-based learning and leadership in school: Conflict management training for holistic, relational conflict resolution. *Frontiers in Social Psychology, 2*, 1412968.

Weber, C. (2020). Reducing conflicts in school environments using proactive and community-building approaches. *Journal of Educational Psychology, 112*(3), 456–470. https://doi.org/10.1016/j.jedup.2020.01.005

Wike, R. E. (2025). Educating students for peace, conflict resolution and productivity in public secondary schools in Rivers State. *BW Academic Journal, 2*, 26–40.

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Unlocking value: How perceived usefulness drives cryptocurrency adoption in Dar es Salaam, Tanzania

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ABSTRACT

This study aimed to investigate the influence of perceived usefulness on the adoption of cryptocurrency in Dar es Salaam, Tanzania. The guiding framework is based on the Technology Acceptance Model. The study was designed to examine the perceptions of perceived usefulness among 172 respondents, who were selected from a total population of 300 cryptocurrency practitioners in Dar es Salaam, using the formula adopted by Yamane (1967). Research adopted a descriptive research design whereby data were collected through structured questionnaires. The data were analyzed using descriptive statistics and inferential statistics via SPSS version 27.0. The findings showed that perceived usefulness significantly positively influenced cryptocurrency adoption, with a p-value of 0.001 < 0.05. Multiple regression analysis revealed that perceived usefulness, perceived ease of use, and perceived risk collectively explained 73.3% of the variance in cryptocurrency adoption ($R^2 = 0.733$, $F = 87.11$, $p < .001$). Perceived usefulness was a significant positive predictor ($\beta = 0.526$, $p = .001$), while perceived ease of use and perceived risk were not statistically significant predictors ($p = .065$ and $p = .012$, respectively). The findings indicate perceived usefulness as the main driver of cryptocurrency adoption. The study findings could serve as a starting point for further research to investigate other factors influencing cryptocurrency adoption in Tanzania. This study extends the knowledge of cryptocurrency adoption in developing countries, particularly Tanzania. There is a need to raise awareness among the public about the benefits and risks of cryptocurrencies, simplify their usage, and address regulatory and security concerns. This study contributes to the understanding of cryptocurrency adoption in emerging markets, such as Tanzania, providing valuable insights for policymakers, financial institutions, and technology developers to endorse financial inclusion and integrate cryptocurrencies into a comprehensive economic agenda.

Keywords: Adoption, Cryptocurrency, Perceived Usefulness, Perceived Ease of Use

I. INTRODUCTION

The 21st century has witnessed an increased demand for cryptocurrencies, driven by substantial technological advancements in the monetary sector, from traditional fiat currencies to electronic, digital, and computer-generated currencies (Mungoli, 2023). Based on the fact that these currencies are facilitated by technological advancements and the evolving landscape of financial economics, they have built trust among the users (Kasamba & Chungu, 2024).

Hence, this innovation promotes the rise and spread of cryptocurrencies, such as Bitcoin, BNB, Ethereum, Solana, and Bitcoin Cash, as well as other decentralized digital assets, governed by digital communities based on blockchain technology. Although cryptocurrencies present significant risks, such as probable misuse for money laundering, terrorism financing, and tax evasion (Ilijevski et al., 2023), they offer multiple benefits, such as low transaction costs, privacy, cross-border functionality, and real-time transaction histories, making the market experience substantial growth (Subashi, 2024).

A well-established legal framework governs digital currency in developed nations, promoting market security, transparency, and innovation, as well as consumer protection. These regulations include the Markets in Crypto-Assets (MiCA) in the European Union, which aims to unify standards to combat cryptocurrency risks such as tax evasion and money laundering in participating countries. (Smith, & Johnson, 2022). Notwithstanding the notable global development and economic payoff, the adoption of cryptocurrencies has met significant challenges in developing countries. For instance, in Nigeria, government policies are vague, with the government threatening action against the use due to potential risks associated with cryptocurrencies. In contrast, other emerging African countries have outright forbidden cryptocurrency trading (Kasamba & Chungu, 2024). Hence, adoption rates remain low in most African countries.

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This stagnant and disappointing statuesque of cryptocurrency adoption in emerging economies implies missing out on the advantages of low-cost, fast international transfers, as evidenced by the high remittance fees for example, around 8.9% in Nigeria in 2021, as compared to the low transaction fees offered by cryptocurrencies.

On the other hand, in Tanzania, the adoption of cryptocurrencies faces similar regulatory hurdles. Although the Bank of Tanzania (BoT) has been cautious, restricting cryptocurrency activities due to concerns about misuse, the regulatory environment is becoming more open to digital finance. Tanzania has introduced fintech-regulatory sandbox regulations in 2024, allowing for controlled testing of fintech innovations, including cryptocurrencies, with an emphasis on consumer protection and anti-money laundering compliance.

Notwithstanding these positive developments, Tanzania still lags behind global trends, as cryptocurrency adoption continues to rise with over 320 million global users by 2022 (Kasamba & Chungu, 2024), which limits economic growth and hinders translation to the digital economy. Moreover, there is limited literature on cryptocurrencies in emerging economies, particularly in African countries like Tanzania, where cryptocurrencies have the potential to address significant financial inclusion challenges (Kiwango & Kamala, 2025; Hamidu et al., 2023).

Current studies mainly focus on countries with advanced digital infrastructures, forgetting the distinctive socio-cultural dynamics, regulatory complexities, and technological limitations that characterize emerging markets like Tanzania (Kasamba & Chungu, 2024; Hamidu et al., 2023) hence this study tries to bridge the gap by open discussion about the influence of the perceived useful influences the adoption of cryptocurrencies in Tanzania so as to add to the existing knowledge and direct policy makers on how to design favorable conditions for activating adoption of cryptocurrencies in Tanzania.

1.1 Statement of the Problem

Although there is successful story about potential of cryptocurrencies to promote fiscal inclusion and enhance revolution in developing economies, its uptake is remained uncertain in the Tanzanian settings, since due to regulatory ambiguity and poor public awareness. Recent studies demonstrated that in the broader cryptocurrency domain, perceived usefulness from (TAM) is the critical predictor of adoption behavior (Jariyapan et al., 2022). However contextual barriers like trust, digital infrastructure, and regulatory framework mediate or attenuate this relationship (Stanciu et al., 2024; Atellu, 2024). In Tanzania, where the fintech regulatory, environment is evolving, yet uptalking is still low, also it is not clear how perception of usefulness among users translated in to adoption behavior. Lack of clear empirical about this aspect, limiting policy makers, technological developers and financial analysts to gain appropriate insights on how to design more effective strategies that leverage cryptocurrency for financial inclusion and economic growth. Therefore, exploring how perceive usefulness influences cryptocurrency adoption among practitioners, in Dar Es Salaam is not only timely but also critical to guide policy, regulation and practice in emerging market

1.2 Research Objective

The main objective of the study was to examine the how Perceived Usefulness Drives Cryptocurrency Adoption in Dar es Salaam, Tanzania

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Technology Acceptance Model (TAM)

The proposed framework is based on the Technology Acceptance Model, which posits that perceived usefulness is a determinant of technology acceptance. Fred Davis developed this model in the 1980s, who sought to gain an understanding of individuals' acceptance and use of new information technologies based on their perceptions of the technology's usefulness and ease of use (Venkatesh at al., 2012). Recently, it has been a widely used theoretical framework in the field of information systems and technology adoption research. In this research, the application will focus on mining knowledge about how perceptions of usefulness can trigger the adoption of Cryptocurrencies in Tanzania.

The basic premise of TAM is that an individual's intention to use a particular technology is influenced by perceived usefulness. Perceived Usefulness (PU) refers to an individual's subjective assessment of how useful the technology is in facilitating their tasks or achieving the intended goals. Evaluation of an individual based on whether particular technology will enhance productivity, efficiency, or effectiveness in performing certain activities (Venkatesh & Davis, 2000)

Based on TAM, individuals are more likely to adopt and use a new technology if they perceive it to be both valuable and easy to use. These perceptions determine their attitude towards the technology, which in turn influences their intention to use it. Yet, TAM does not overlook the influence of external forces, such as social influences, organizational context, and facilitating conditions (e.g., availability of training, technical support), on the adoption of technology.

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(Venkatesh et al., 2012). Based on ideas of TAM, it is possible to understand and predict decisions of someone to adopt Cryptocurrencies like Bitcoin, Ethereum, and others.

Here's how TAM relates to cryptocurrency adoption: Individuals' perceptions of the usefulness of Cryptocurrencies are paramount in their adoption decisions. Factors such as the perceived benefits of using Cryptocurrencies, including the reduction of fees, facilitating cross-border transfers, enhanced financial privacy, expanded investment opportunities, and the potential for decentralization, can persuade users as they influence their perceived usefulness (Daud et al., 2022) Individuals' attitudes towards Cryptocurrencies, shaped by their perceptions of usefulness and ease of use, significantly influence their intention to adopt and use them. Positive attitudes towards the benefits and usability of Cryptocurrencies are associated with higher adoption rates (Daud et al., 2022; Venkatesh & Davis, 2000).

Therefore, by relating the TAM framework to cryptocurrency adoption, the study expanded understanding of the factors that induce individuals' decisions to adopt and use Cryptocurrencies, and identified strategies to promote broader adoption and acceptance of digital assets in Tanzanian society.

2.2 Empirical Review

According to Nagy et al. (2020), perceived usefulness encompasses users' views on the usefulness of Cryptocurrencies in transactional and financial activities. Therefore, economic incentives, including cost reduction and return on investment, govern the perceived usefulness. Also, Cryptocurrencies are claimed to be more suitable for users compared to traditional banking in areas with limited banking services. Cryptocurrency is anticipated to provide secure transaction systems that are difficult to swindle (Hull et al., 2019).

Moreover, its perceived usefulness is catalyzed by the ability to transact Cryptocurrencies globally without intermediaries (Murugappan et al., 2023). Furthermore, Gupta and Shah (2020) in their study focusing on the socio-cultural and economic factors influencing the adoption of Cryptocurrencies in India, with the aid of a qualitative design, with 60 participants across urban and rural areas of India they found that the perceived usefulness in India was linked to financial benefits and convenience, with the factors that influence the application of Cryptocurrencies.

Alrehaili et al. (2024) found that perceived usefulness had limited effect on cryptocurrency adoption indicating contextual factors may dilute the direct influence of perceived usefulness. Also, Khan and Shah (2023) found that perceived usefulness had no significant effect on the adoption of cryptocurrency adoption in developing countries due to contextual factors.

Despite this literature, perceived usefulness rests on the level of awareness about cash inflows and the benefits available to Cryptocurrencies in the respective community. Therefore, this study will assess this in Tanzania to establish whether Tanzanians are aware of its usefulness to the extent that they make informed choices regarding cryptocurrencies.

III. METHODOLOGY

3.1 Research Area

This study was conducted in Dar es Salaam, Tanzania, the nation's largest city and economic hub. Dar es Salaam serves as a major port and commercial center with a diverse population and growing economy. With these attributes, it provides a unique setting for exploring the adoption of cryptocurrency in Tanzania. Nature of city urban environment, financial infrastructure, and technology-savvy population, as well as presence of headquarters of various giant local and foreign financial institutions, as well as regulators like BOT, make it an ideal setting to investigate the key determinant towards adoption of cryptocurrency, shedding light on the future of digital currency in Tanzania. Moreover, over its diverse population, presence of giant universities, and financial institutions had guaranteed the presence of financial controllers, business analysts, IT officers, lawyers, and brokers, making its population most suitable to this study as they might have reasonable aware about cryptocurrency

3.2 Research Design

According to Dhlakama and Murairwa (2024) a research design refers to a strategic framework for action that links research questions to the execution or implementation of the research strategy. It is a time-based plan that guides the selection of sources and types of information, all of which are based on the research questions.

This study adopted a descriptive research design. This design was chosen since it allows researchers to describe and characterize the current situation or phenomenon without manipulating variables. (McMillan & Schumacher, 2010) Hence, through this design, researchers assessed the current level of cryptocurrency adoption in Tanzania and understood the factors influencing it. Thereby identifying factors affecting the adoption of Cryptocurrencies without necessarily establishing causality.

The researcher adopted a quantitative approach with the intention of quantifying the influencing elements. This is because this method enables the more straightforward quantification of various factors, such as demographic variables,

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level of awareness, perceived benefits, and technological infrastructure. By assigning numerical values to these factors, researchers ensured statistical analysis and comparisons, thereby facilitating the reliability and generalizability of the findings, as suggested by (Creswell & Creswell, 2018).

3.3 Data Collection Methods

The researcher applied Quantitative data collection methods, specifically online surveys and electronic questionnaires. This approach was adopted because it enables the efficient administration of large sample sizes, allowing for the collection of data from diverse respondents within a short period. This is especially advantageous when studying rapidly evolving phenomena, such as cryptocurrency adoption, as noted by (Dillman et al, 2024). Moreover, these methods were suitable as they guarantee data reliability by providing structured responses that are easy to analyses. Statistically (Fink, 2017). Furthermore, the use of digital platforms aligns well with the technological trends associated with cryptocurrency adoption itself, providing valuable insights into the factors that influence digital currency usage.

3.4 Population of the Study

A population may be defined as all cases that conform to a designated set of specifications (Nachmias & Nachmias, 2018). The targeted population of this study consisted of an estimated 300 cryptocurrency practitioners from Dar es Salaam who worked as lawyers, bank examiners, bank supervisors, directors, financial analysts, compliance officers, IT managers, risk managers, and policy advisors in various financial organizations, including BOT, Banks, and Business Consultancy Firms (see Table 1). Researchers choose this population since it possesses relevant knowledge and expertise in the field of Cryptocurrencies.

This selection was based on their direct involvement in financial regulation, oversight, and their understanding of emerging financial technologies, including Cryptocurrencies. By focusing on these professionals, the study aimed to gather insights from individuals who are most likely to have in-depth knowledge and experience related to the factors influencing cryptocurrency adoption and its regulatory implications within Tanzania's financial sector. This approach ensured that the study's findings would be informed by those who are directly engaged in the regulatory processes surrounding digital financial services. (Fink, 2017).

Table 1

Survey Population

S/n	Participant Group	Population Size	Proportional (%)
1	Lawyers	20	6.7%
2	Bank Examiners	25	8.3%
3	Bank Supervision Managers	25	8.3%
4	Directors	100	33.3%
5	Financial Analysts	10	3.3%
6	Compliance Officers	25	8.3%
7	IT Managers	10	3.3%
8	Risk Managers	10	3.3%
9	Policy Advisors	10	3.3%
10	Other Key Personnel	10	3.3%
11	External Experts/Consultants	5	1.7%
12	Senior Management	50	16.7%
Total		**300**	**100%**

3.5 Sample Size and Sampling Techniques

The sample size of this study was 172, calculated using the formula adopted by Yamane (1967). The Yamane (1967) formula is commonly used in research to determine the appropriate sample size from a known population size, especially when the total population is finite and the researcher seeks to achieve a reliable and statistically valid sample. The formula is as follows:

$n = N / (1 + N(e^2))$

Where:

n = Sample size

N = Population size

e = Accepted sampling error (5%)

$$n = \frac{300}{1 + 300\ x\ 0.05^2}$$

$$= 172$$

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3.6 Sampling Techniques

The study employed probability sampling methods, specifically utilizing simple random sampling because it has less bias. Probability sampling techniques are preferred in research because they allow for the generalization of findings to the broader population. Therefore, it enhances the reliability and validity of the research findings, as they can be generalized with more confidence.

3.7 Data Analysis Techniques

Data was processed using Statistical Package for the Social Sciences (SPSS) software version 27.0. The researcher used SPSS to assess the completeness, consistency, and comprehensiveness of the data. Descriptive statistics were employed to present the quantitative data, interpreting the information through frequencies, percentages, and means. Since the study adopted multiple regression analysis to establish the relationship between variables. The multiple regression equation is expressed as follows: -

$TACC = \beta 0 + \beta_1 PUF + \beta_2 PEU + \beta_3 PR \mu$

TACC – To Adopt Crypto Currencies

PUF – Perceived Usefulness

PEU – perceived ease of use

PR- Perceived risks

Where β0, 1, 2 and 3 are the coefficients of the variables, while μ is the error term

Table 2

Variables Measurement

Variables	Sub –Variables	Measurement/scale
Perceived Usefulness	Financial Benefits, Convenience Security, Global Acceptance	5-point Likert scale (1 = strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree and 5 = strongly agree
Adoption of cryptocurrency	Decision to engage with or invest in cryptocurrency	5-point Likert scale (1 = strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree and 5 = strongly agree

The variables used by the study are indicated in Table 2. The study applied perceived ease of use (PEOU) and the perceived risks (PR) as the control variables. Control variables reduce bias and clarify the relationship between the perceived usefulness and the adoption of cryptocurrency

3.8. Reliability and Validity

Validity was ensured through pre-testing of the questionnaire, which served as the primary research tool, to provide clarity and confirm that it generates relevant data for analysis and knowledge gap filling. The pre-test helps the researcher assess whether the questions are clear and accurately measure what they are intended to measure. However, reliability was assessed using Cronbach's Alpha test. According to standard benchmarks, an alpha value of 0.7 or above was considered acceptable, indicating that the items used to measure the variables had internal consistency. Specifically, the Perceived Usefulness variable had a Cronbach's Alpha of 0.746. These findings suggest that the items used to calculate these constructs were reliable and consistent, ensuring the validity of the data collected for the study.

Table 3

Reliability Test

S/N	Variable	No of Items	Cronbach (Alpha)	Description
01.	Perceived Usefulness	15	.746	Reliable

IV. FINDINGS & DISCUSSION

4.1 Response Rate

According to Table 4, a total of 154 participants responded, representing 89.5% of the sample, while 18 participants (10.5%) did not respond. This high response rate of 89.5% reflects strong engagement and participation, indicating that the participants were highly motivated to contribute to the study. According to Martin (2021), a response rate of 50% is considered adequate for analysis, 60% is good, and 70% or higher is considered very good. The achieved response rate of 89.5% significantly exceeds these thresholds, implying reliability and robustness of the data for analysis and reporting

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Table 4

Response Rate

Responses	Frequency	Percentage
Responded	154	89.5
Not responded	18	10.5
Total	**172**	**100**

4.1.1 Demographic Analysis of Respondents

The study explored several demographic factors, including age, gender, highest level of education, and relevant employment experience, as these factors can significantly influence participants' perceptions, attitudes, and behaviors related to the research topic. The results were as shown in Table 5 below.

Table 5

Demographics of Respondents

Code	Category	Response Options	Frequency (n)	Percentage (%)
V101	Age Group	Below 18 years	0	0
		18–24 years	28	18
		25–34 years	74	48
		35–44 years	33	21
		45–54 years	12	8
		55 years and above	7	5
V102	Sex	Male	102	66
		Female	52	34
V103	Highest Level of Education	No formal education	5	3.2
		Primary education	0	0
		Secondary education	0	0
		Certificate/Diploma	40	26.
		Bachelor's Degree	70	45.
		Postgraduate Diploma	23	15.
		Master's	15	10
		PhD	6	4
V104	Current Occupation	Lawyers	40	26.0
		Bank Examiners	30	19.5
		Bank Supervision Managers	25	16.2
		Compliance Officers	20	13.0
		IT Managers	15	9.7
		Risk Managers	5	3.2
		Policy Advisors	19	12.3
V107	Knowledge about Cryptocurrencies	Very knowledgeable	32	21
		Somewhat Knowledgeable	102	66
		Not knowledgeable about all	20	13

4.1.2 Age of Respondents

The findings in Table 5 showed that the majority of respondents were aged between 25 and 34 years (48%), indicating that most participants belong to a youthful demographic, which aligns with a population likely to be more digitally engaged. The 35–44 age group accounted for 21%, indicating moderate representation among middle-aged adults. Smaller proportions were observed in the 45–54 years (8%) and 55 years and above (5%) groups, which may reflect lower interest or access to digital technologies among older age groups. No respondent was below 18 years, while the age group of 18–24 years accounts only 18% possibly due to age restrictions for participating in the study or engagement with cryptocurrencies and nature of schooling timelines as per Tanzanian curriculum most of youth below 24 years are possibly still in school not yet graduate for employed in the critical companies like areas where data was collected.

Table 5 reveals that males constituted 66% of the respondents, while females constituted 34%. These findings underscore the importance of promoting gender inclusivity and addressing challenges that might limit female engagement in the cryptocurrency ecosystem. These results can inform strategies to bridge the gender gap, such as tailored educational programs and awareness campaigns.

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4.1.3 Level of Education of the Respondents

The results showed that most respondents held a Bachelor's Degree (45%)**,** followed closely by those with a Certificate/Diploma (26.0%) and a Postgraduate Diploma (15%), as indicated in Table 5**.** This means that a sample is capable of understanding the complexities of cryptocurrency. Only 10% and 4% of the respondents hold a Master's Degree or PhD, respectively, reflecting limited representation of highly advanced educational qualifications. Since data was collected from employees of various giant organizations, individuals with Secondary education and primary education were not involved due to the nature of the areas from which the data were collected

4.1.4 Current Occupation of Respondents

The data reveal the distribution of current occupations among the respondents, with lawyers representing the largest group at 26.0%, followed by bank examiners at 19.5%. Bank supervision managers account for 16.2%, indicating a strong presence of individuals with regulatory or supervisory roles within the banking sector (see Table 5). Compliance officers make up 13.0%, suggesting a focus on ensuring adherence to regulations. IT managers, representing 9.7%, and risk managers, at 3.2%, reflect the importance of technology and risk management within the industry. Policy advisors, at 12.3%, contribute to the strategic and advisory functions in the sector. The spread of occupations suggests a diverse professional background among the respondents, with a significant emphasis on legal, regulatory, and managerial roles in the banking and finance sectors. These findings highlight a well-rounded group of individuals, crucial for understanding broader industry dynamics.

4.1.5 Knowledge about Cryptocurrencies

The majority of respondents **(**66%**)** described themselves as somewhat knowledgeable about cryptocurrencies, indicating moderate awareness and understanding of the subject, as shown in Table 5. However, 21% reported being very knowledgeable, showing a smaller but substantial group with advanced expertise. Meanwhile, 13% indicated they were not knowledgeable at all, reflecting a knowledge gap among some participants. Since most of the population was aware, this population was suitable for the study aimed at examining the influence of perceived usefulness on cryptocurrency adoption in Tanzania.

4.1.5 Descriptive Analysis of the Study Variables

The study examined the perceived usefulness of cryptocurrency adoption in Tanzania, a critical factor that significantly influences individuals' willingness to adopt and engage with cryptocurrencies. This evaluation was crucial because perceived usefulness often determines the overall adoption rate and user satisfaction with new technologies. Respondents in the study indicated varied levels of comfort with using cryptocurrencies, as shown in table 6

Table 6

Perceived Usefulness in the Adoption of Cryptocurrency in Tanzania

Code	Statements	N	Min	Max	Mode	Mean	SD
V301	Belief in the financial benefits of cryptocurrency	154	1.00	5.00	2	3.214	1.232
V302	Cost-effective cross-border transfers	154	1.00	4.00	2	3.117	1.205
V303	Convenience over traditional methods	154	2.00	5.00	3	3.486	1.112
V304	Time-saving compared to banking	154	1.00	4.00	2	3.049	1.102
V305	Convenience in online payments	154	2.00	5.00	3	3.392	1.160
V306	Enhanced security for financial transactions	154	1.00	5.00	2	3.155	1.215
V307	Confidence in platform security and data protection	154	1.00	5.00	3	3.140	1.121
V308	Security features increase the likelihood of use	154	2.00	5.00	3	3.332	1.098
V309	Crypto platforms are more secure than traditional banking	154	2.00	4.00	2	3.214	1.167
V310	Belief in the wide international acceptance	154	2.00	5.00	3	3.563	1.104
V311	Usefulness for global purchase	154	1.00	5.00	3	3.452	1.135
V312	Cryptocurrency as a reliable store of value in fluctuating markets	154	1.00	5.00	3	3.249	1.207
V313	Practicality of cryptocurrency for long-term financial planning	154	2.00	5.00	3	3.421	1.130
V314	Usefulness of cryptocurrency for high-return investments	154	1.00	5.00	2	3.314	1.142
V315	Efficiency of cryptocurrency for international business transactions	154	1.00	5.00	3	3.455	1.113

The table shows that users primarily identify cryptocurrency as convenient and universally applicable, with the highest mean scores in terms of ease of operation (V303 = 3.486) and international acceptance (V310 = 3.563). Security features and platform trust also received moderate support; however, inconsistency suggests multifarious confidence. Generally, the data reflects positive sentiment toward crypt's practicality, tempered by concerns over clarity and consistency. However, the paragraphs below explain the individual sections that formed the perceived usefulness perceptions of respondents

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The results shown in Table 6 disclose moderate to strong agreement among respondents concerning the financial benefits and transactional convenience of cryptocurrency. With mean scores ranging from 3.117 to 3.486, users usually perceive crypto as cost-effective and time-saving, particularly for online and cross-border transactions. These results align with studies by Kumar et al. (2021) and Garcia and Lopez (2022), although variability in responses suggests enduring concerns about reliability and trust compared to traditional systems.

Safety sensitivities were thoughtfully optimistic, with mean scores ranging from 3.140 to 3.332. Respondents recognized the value of security features in influencing platform use, yet concerns about data protection and cyber risks persisted. This is concurred with the study from Martin (2021) and Brown and Kelly (2021). However, they disagreed with the notion that individuals viewed crypto platforms as more secure than traditional banking, as proposed by Zhao and Zhang (2021). Others, however, remained skeptical that this might be due to market volatility and inconsistent platform safeguards.

Furthermore, Global utility and investment potential were regarded as favorable with high mean scores for international acceptance (3.563), global purchases (3.452), and business transactions (3.455). Respondents also perceived cryptocurrency as a viable long-term financial tool (mean = 3.421) (see Table 6); however, concerns about speculation and volatility from others strengthened their eagerness. These findings align with global trends reported by Johnson and McDonald (2020) and Santos et al. (2022), highlighting both optimism and caution in the cryptocurrency's embryonic role.

Therefore, even if respondents perceive cryptocurrency as a valuable tool for global transactions, financial planning, and investment, concerns about volatility and trust persist as a burning issue that needs intervention. These findings underscore its growing relevance in modern finance, while also highlighting the need for greater stability and user training to facilitate adoption, as proposed by Johnson and McDonald (2020) and Ahmed et al. (2021).

4.2 Multiple Regression Analysis

4.2.1 Model Summary

Multiple linear regression was utilized to examine the significance of the relationships between the dependent variable and the two independent variables. This analysis aims to assess the combined influence of the independent variables on the dependent variable and determine the individual contribution of each independent variable. The results of this analysis are presented in the model summary in Table 7, providing a detailed overview of the relationships and the extent to which each independent variable impacts the dependent variable.

Table 7

Regression Analysis Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	0.85	**0.733**	0.725	0.39565

Predictors: (Constant), Perceived Usefulness

The findings from the model summary in Table 7 indicate a strong relationship between the independent variable, perceived usefulness, and the dependent variable, adoption of cryptocurrency, as shown by an R value of 0.856. This suggests that the independent variables collectively account for a significant proportion of the variation in the dependent variable. The R Square value of 0.733 indicates that approximately 73.3% of the variance in the dependent variable can be explained by the two predictors. The adjusted R-squared value of 0.725 further confirms the robustness of the model, accounting for potential overfitting and demonstrating the adequacy of the predictors in explaining the outcome.

4.14 .2 Analysis of Variance

Analysis of Variance results report how well the regression equation fits the data (i.e., predicts the dependent variable), and the results are shown in Table 8 below.

Table 8

Analysis of Variance (ANOVA)

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	13.636	3	4.545	87.110	.000[b]
	Residual	14.871	150	0.157		
	Total	28.507	153			

Dependent Variable: Adoption of Cryptocurrency

The ANOVA results, as shown in the table, indicate that the regression model is highly significant, with an F-value of 87.110 and a significance level (Sig.) of .000, which is well below the conventional threshold of 0.05. This

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suggests that the independent variable (Perceived Usefulness) and control variables (Perceived Ease of Use and Perceived Risk) collectively explain a significant portion of the variation in the dependent variable. The regression sum of squares (13.636) indicates the amount of variation explained by the model, while the residual sum of squares (14.871) represents the variation that remains unexplained. The mean square for the regression (4.545) is substantially higher than that of the residuals (0.157), further emphasizing the model's strong explanatory power. The total sum of squares is 28.507, and with 153 degrees of freedom, this confirms that the model provides a statistically significant explanation of the data.

4.2.2 Regression Analysis

The regression analysis in Table 9 presents the coefficients for the independent variables influencing the dependent variable.

Table 9

Regression Coefficients Results

Model		Unstandardized Coefficient (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1	(Constant)	0.397	0.236		1.679	0.096
	Perceived Usefulness	0.493	0.066	0.526	7.477	0.001
	Perceived Ease of Use	-0.319	0.087	0.321	3.677	0.065
	Perceived Risks	0.114	0.071	0.121	1.604	0.012

The constant value of 0.397, as shown in Table 9, indicates the baseline value of the dependent variable when all independent variables are set to zero. Perceived Usefulness has a coefficient of 0.493 with a standardized beta of 0.526, showing a significant positive influence on the dependent variable, with a highly significant p-value of 0.001. Perceived Ease of Use, however, has a negative unstandardized coefficient of -0.319 and a standardized beta of 0.321, but its p-value of 0.065 suggests that the effect is not statistically significant at the 0.05 level, although it might still hold relevance in a broader context.

4.3 Discussion of Findings

4.3.1 Discussion Based on Statistical Results

Based on statistical findings, as reported in Table 6, a positive perception of cryptocurrency's usefulness, in terms of transactional effectiveness and global applicability, was observed. Users had strong agreement with the nation concerning the ease of use of cryptocurrency (M = 3.486) and its international acceptance (M = 3.563), indicating that users' utility rests on the operational and borderless nature of cryptocurrency. These findings concur with Kumar et al. (2021), who claim that users tend to accept cryptocurrency due to its ability to enable quicker and cheaper international transactions. On the other hand, the presence of inconsistency in responses implies that persistent uncertainties regarding consistency and reliability dilute these perceived paybacks. As Garcia and Lopez (2022) noted, users may enjoy the economic advantages of digital currencies while simultaneously harboring uncertainty about the platform's firmness and institutional sponsorship. Thus, while the practicality of cryptocurrency is accredited, this is tempered by trepidations about its setup and governance.

On the other hand, other factors, such as perceived usefulness, security concerns, and regulatory issues, may play a more substantial role in determining adoption. Perhaps this is because it is not a technology-driven solution, and people are more concerned with financial benefits rather than the simplicity of the system. Therefore, emerging technologies, such as cryptocurrency, may require more than just ease of use for widespread adoption

Therefore, based on the findings, it is clear that users perceive cryptocurrency as applicable, particularly for its ease of use and international transactions (Kumar et al., 2021). Positive perceptions are motivated by its border nature and potential financial benefits (Garcia & Lopez, 2022). Yet, concerns about platform reliability and security persist, as noted in debates by Martin (2021) and Brown & Kelly (2021). Although global utility and investment appeal are appreciated (Santos et al., 2022), trust and market volatility pose threats to its full integration. These concerns should be well addressed through both education and regulation, as advised by Ahmed et al. (2021). Since adequate insight about these concerns will motivate investors' interest in cryptocurrency in the merging economy.

4.3.2 Discussion Based on Regression Output

The regression results indicate strong explanatory power, with an R^2 of 0.733, as well as a significant F-test ($p < 0.001$), indicating the role of perceived usefulness in the adoption of cryptocurrency. Even though a cross-sectional design hinders the ability to draw causal inference since R^2 doesn't mean causality, and 27% of the variance is not fully explained, still, there is a relationship between usefulness and adoption of cryptocurrency, although further study based on broader models in the complex domain of crypto adoption is critical to make a conclusion based on multiple variables.

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Moreover, Perceived Usefulness emerged as a robust and critical predictor, aligning with TAM theory and existing research, thereby aligning with the findings of Atellu (2024). Perceived Ease of use has an unexpected, non-significant negative effect, which means that users tend to rate function over simplicity. The modest but significant effect of Perceived Risk ($p = 0.012$) may imply that users are willing to tolerate risk for perceived benefits, as indicated by Frontiers (2021). The reported nuanced findings underscore the need for further investigation into intervening factors and long-term studies. (Chris et al., 2022; Frontiers, 2021) Therefore, Forthcoming research should examine trust, user experience, and regulatory clarity to enhance model precision and practical relevance

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The purpose was to assess the influence of perceived usefulness on the adoption of cryptocurrency in Tanzania. The study found that the perceived usefulness is statistically significantly positively significant and the adoption of cryptocurrency. Therefore, the study demonstrates that perceived usefulness is a key determinant of cryptocurrency adoption in Tanzania. Policy makers and financial regulators should not only raise public awareness about the benefits of cryptocurrency, but also provide training on how to navigate the design interface of cryptocurrency, since it is a worldwide agenda on economic liberation through digital currency innovation

5.2. Recommendations

To facilitate the adoption of cryptocurrencies, the Tanzanian government should establish clear and transparent regulations that define the legal status of cryptocurrencies, ensuring a consistent and predictable framework for their use. This includes creating guidelines for cryptocurrency exchanges, digital wallets, and initial coin offerings (ICOs). A well-defined regulatory environment will not only encourage adoption but also attract international investment in Tanzania's cryptocurrency market.

Since the study concentrated on the Dar es Salaam region, with professionals whose position had exposed them to reasonable knowledge about cryptocurrency, it suffers from limited generalizability of the findings to the broader population, particularly in rural areas where cryptocurrency adoption might be very low or negligible at all and to the semiskilled population with little knowledge about it. The sampling method, although effective in targeting knowledgeable respondents, may have introduced bias, as it was more likely to attract individuals already familiar with or interested in cryptocurrency.

Therefore, further study is needed to better understand the challenges hindering cryptocurrency adoption in Tanzania, based on other segments of the population in various parts of the country. This research should investigate the regulatory, technological, and socio-economic barriers that hinder the widespread adoption and use of cryptocurrencies. By addressing these areas, Tanzania will foster a more conducive environment for cryptocurrency adoption, paving the way for its potential benefits in improving financial inclusion, access to services, and economic growth.

REFERENCES

Ahmed, S., Rahman, M., & Saifuddin, M. (2021). Bridging the trust gap in cryptocurrency adoption: Role of regulation and financial literacy. *Journal of Financial Innovation, 9*(2), 134–150.

Alrehaili, A., White, M., & Beloff, N. (2024). Systematic review of usage patterns and acceptance of blockchain-based cryptocurrencies across diverse domains. *Discover Analytics, 6*(4), 45. https://doi.org/10.1007/s44257-024-00018-x

Atellu, A. R. (2024). Determinants of cryptocurrency adoption: Evidence from an emerging economy. *Journal of Economics, Finance and Accounting, 11*(2), 120–135. https://doi.org/10.17261/Pressacademia.2024.1959

Brown, T., & Kelly, R. (2021). Cybersecurity risks in fintech: A user-centric approach. *Journal of Information Security, 12*(4), 88–101. https://doi.org/10.4236/jis.2021.124005

Chris, R., Sascha, K., & Ricarda, B. (2022). Virtual currencies like Bitcoin as a paradigm shift in the field of transactions. *International Business & Economics Research Journal, 14*(4), 34–39.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed., 275 pp.). SAGE Publications.

Daud, S., Ahmed, U., & Hassan, A. (2022). Factors affecting adaptability of cryptocurrency: An application of Technology Acceptance Model. *Frontiers in Psychology, 13*, Article 903473.

Dhlakama, L., & Murairwa, S. (2024). A literature survey: Data gathering instrument and method selection framework. *International Journal of Research and Innovation in Social Science, 8*(10), 1078–1091. https://doi.org/10.47772/IJRISS.2024.8100090

Licensed Under Creative Commons Attribution (CC BY-NC)

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2024). *Internet, phone, mail, and mixed mode surveys: The tailored design method* (5th ed., 528 pp.). Wiley.

Fink, A. (2017). *How to conduct surveys: A step by step guide* (6th ed., 224 pp.). SAGE Publications.

Garcia, M., & Lopez, D. (2022). Adoption of cryptocurrencies in developing economies: Barriers and motivators. *International Journal of Emerging Markets, 17*(6), 1453–1470. https://doi.org/10.1108/IJOEM-10-2021-1479

Gupta, R., & Shah, R. (2020). Perceived risks and challenges associated with cryptocurrency adoption in India. *Journal of Digital Finance and Technology, 15*(3), 245–263. https://doi.org/10.1016/j.dfin.2020.05.003

Hamidu, K., Pastory, D., Massi, J., & Mrindoko, A. (2023). Towards cryptocurrency adoption in Tanzania: Potential risks and challenges to the financial ecosystem. *International Journal of Social Science Research and Review, 6*(7), 691–709. https://doi.org/10.47814/ijssrr.v6i7.1355

Hull, C. E., Hung, P. C., & DeWitt, T. (2019). Blockchain security and the effects on cryptocurrency adoption. *Information & Management, 56*(7), Article 103140.

Ilijevski, I., Ilik, G., & Babanoski, K. (2023). Cryptocurrency abuse for the purposes of money laundering and terrorism financing: Policies and practical aspects in the European Union and North Macedonia. *European Scientific Journal, 19*(11), 100. https://doi.org/10.19044/esj.2023.v19n11p100

Jariyapan, P., Mattayaphutron, S., Gillani, S. N., & Shafique, O. (2022). Factors influencing the behavioural intention to use cryptocurrency in emerging economies during the COVID-19 pandemic: Based on Technology Acceptance Model 3, perceived risk, and financial literacy. *Frontiers in Psychology, 12*, Article 814087. https://doi.org/10.3389/fpsyg.2021.814087

Johnson, T., & McDonald, A. (2020). Cryptocurrency as a global financial tool: Opportunities and challenges. *Journal of Global Finance, 6*(3), 215–230. https://doi.org/10.1016/j.jgf.2020.03.004

Kasamba, U., & Chungu, K. (2024). A systematic literature review on the adoption of cryptocurrency as an investment option. (Unpublished manuscript, State University).

Khan, M. A., & Shah, S. Z. A. (2023). Cryptocurrency adoption in developing countries: Effects on consumer trust and continuance intention to adopt. *Journal of Consumer Behavior, 5*(6), 46. Advance online publication. https://doi.org/10.1002/cb.2109

Kiwango, T., & Kamala, R. M. (2025). Determinants of cryptocurrency adoption in Tanzania's banking sector. *The Journal of Informatics, 5*(1), 45. https://doi.org/10.59645/tji.v5i1.627

Kumar, V., Sharma, A., & Gupta, S. (2021). Understanding consumer adoption of cryptocurrency: A value-based approach. *Technological Forecasting and Social Change, 173*, Article 121064.

Martin, J. (2021). Consumer confidence in decentralised finance platforms: An empirical investigation. *Finance Research Letters, 42*, Article 101879. https://doi.org/10.1016/j.frl.2020.101879

McMillan, J. H., & Schumacher, S. (2010). *Research in education: Evidence based inquiry* (7th ed.). Pearson.

Mungoli, N. (2023). Deciphering the blockchain: A comprehensive analysis of Bitcoin's evolution, adoption, and future implications [Pre-print]. arXiv. https://arxiv.org/abs/2304.02655

Murugappan, M., Nair, R., & Krishnan, S. (2023). Global market perceptions of cryptocurrency and the use of cryptocurrency by consumers: A pilot study. *Journal of Theoretical and Applied Electronic Commerce Research, 18*(4), 1955–1970. https://doi.org/10.3390/jtaer18040098

Nachmias, C., & Nachmias, D. (2018). *Research methods in the social sciences* (9th ed.). Routledge.

Nagy, A., Neff, C., & Alhawari, S. (2020). Financial benefits and user perceptions of cryptocurrency adoption: A systematic review. *Journal of Financial Innovation, 6*(1), 1–15.

Santos, R., Almeida, P., & Chen, H. (2022). Crypto-assets in the digital age: Investment perceptions and market behaviours. *Journal of Financial Markets, 61*, Article 100675. https://doi.org/10.1016/j.finmar.2022.100675

Smith, P., & Johnson, R. (2022). The impact of perceived risks on cryptocurrency adoption among American millennials. *Journal of Financial Technology and Innovation, 23*(4), 56–72. https://doi.org/10.1007/jfti.2022.19

Stanciu, A., Partsch, M., & Lechner, C. M. (2024). Basic human values and the adoption of cryptocurrency. *Frontiers in Psychology, 15*, Article 1395674. https://doi.org/10.3389/fpsyg.2024.1395674

Subashi, R. (2024). Cryptocurrencies and money laundering. *Balkan Journal of Interdisciplinary Research, 10*(1), 55–62. https://doi.org/10.2478/bjir-2024-0005

Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science, 46*(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly, 36*(1), 157–178. https://doi.org/10.2307/41410412

Zhao, L., & Zhang, Y. (2021). Trust in blockchain technology: A comparative study between banks and crypto-platforms. *Journal of Business Research, 124*(5), 56–67. https://doi.org/10.1016/j.jbusres.2020.11.017

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Emergence of *Staphylococcus saprophyticus* as the predominant uropathogen in febrile children under five years at Alupe Sub-County Referral Hospital, Busia County, Kenya

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ABSTRACT

Urinary tract infections (UTIs) remain among the most common bacterial infections in febrile children under five, yet their etiological patterns are changing across sub-Saharan Africa. In resource-limited settings such as rural Kenya, diagnostic dilemmas compound this burden. A cross-sectional study was conducted between November 2024 and March 2025, enrolling about 200 febrile children aged 1 to 5 years. The sample size was calculated using the single population qualitative variable formula. Children presenting with fever are defined as having an axillary temperature ≥37.5°C measured using a calibrated digital thermometer. The clean-catch method was used to collect the urine samples in sterile urine bottles and cultured on standard media. Cysteine Lactose Electrolyte Deficient Agar (CLED) was used for primary culture, MacConkey agar for selective isolation, and subcultured on Blood Agar. A culture-confirmed UTI was defined as $\geq 10^5$ CFU/mL of a single organism from a clean-catch midstream urine sample. Mixed cultures or bacterial counts below this cut-off were considered non-significant, and colony-count criteria ($>10^5$ CFU/mL plus pyuria) minimized false positives. Socio-demographic data were obtained through structured caregiver interviews. Associations between infection status and fever were analyzed using chi-square and Fisher's exact tests, with $p<0.05$ considered significant. Urine cultures yielding microbial growth were identified using standard bacteriological techniques. Seventy-seven (38.5%) children had culture-confirmed urinary tract infections. Staphylococcus saprophyticus was the most frequent pathogen (46.3%), followed by Escherichia coli (19.2%) and Staphylococcus aureus (12.8%). Other isolates included Klebsiella pneumoniae (5.2%), Pseudomonas aeruginosa (3.9%), Streptococcus pneumoniae (2.6%), and several other minor species. While the primary focus of this study was on bacterial uropathogens, Candida albicans (3.9%) was also isolated in some specimens. Infection rates were slightly higher in boys (21.5%) than in girls (17.0%), though this difference was not significant ($p=0.101$). Fever was not associated with infection ($p=0.7$). Staphylococcus saprophyticus has emerged as a dominant uropathogen among the febrile children in this rural Kenyan setting, indicating a potential shift in local etiology. Continuous local surveillance and health education are essential for the prevention and early management of urinary tract infections.

Keywords: Busia County, *Escherichia Coli,* Febrile Children, *Gender* Distribution, Pediatric UTI, Rural Kenya, *Staphylococcus Saprophyticus*, Uropathogen Shift

I. INTRODUCTION

Urinary tract infections (UTIs) remain among the most common bacterial infections in childhood and are a leading cause of morbidity in low-resource settings (Foxman & Brown, 2016). Early childhood UTIs can progress to renal scarring, hypertension, or long-term kidney dysfunction if inadequately diagnosed or managed (Shaikh *et al*., 2018). In rural areas, these infections often present as nonspecific febrile illnesses, complicating early detection and treatment. Globally, *Escherichia coli* accounts for up to 90% of community-acquired UTIs (Agrawal & Paunikar, 2024). Yet emerging evidence from East Africa suggests an epidemiological transition, with increasing involvement of Gram-positive organisms such as *Staphylococcus saprophyticus* and *Staphylococcus aureus* (Kiiru *et al*., 2023). These shifts are likely shaped by hygiene practices, climate, and local environmental exposures.

Despite their public-health importance, region-specific data on pediatric UTIs in rural Kenya remain limited. Understanding the local bacterial spectrum and gender distribution is vital for guiding clinical suspicion and preventive interventions. This study, therefore, examined the etiological profile of UTIs among children aged one to five years at Alupe Sub-County Hospital, and explored gender associations within this population.

1.2 Research Objective

To isolate and characterize bacterial pathogens responsible for UTIs among febrile children aged one to five years attending Alupe Sub-County Hospital, and to examine their distribution across gender.

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1.3 Research Questions

i. Which bacterial pathogens are associated with urinary tract infections among febrile children aged one to five years attending Alupe Sub-County Hospital?
ii. How are these bacterial pathogens distributed across gender among the study population?

II. METHODOLOGY

2.1 Study Design and Setting

We conducted a hospital-based cross-sectional study at Alupe Sub-County Referral Hospital, a public facility serving as the primary referral centre for pediatric cases in Busia County, western Kenya. Data collection took place from November 2024 to March 2025, covering both the short rainy season and the dry period to minimize seasonal bias.

2.2 Sample Size Determination

The sample size was calculated using Cochran's (1963) formula for estimating a single population proportion in a finite or large population, as reproduced in most modern biostatistics texts (Daniel, 1999):

$$n_0 = (Z\text{^}2 \cdot p \cdot q)/d\text{^}2$$

Where:

i. n_0= the initial calculated sample size
ii. Z= 1.96 (the critical value from the standard normal distribution for a 95% confidence level)
iii. p= 0.119 (expected proportion of UTI among febrile children, derived from Masika *et al*., 2017)
iv. $q = 1 - p$= 0.881
v. d= 0.05 (margin of error or precision)

Substituting the values:

$$n_0 = \frac{(1.96)^2 \times 0.119 \times 0.881}{0.05^2} = \frac{3.8416 \times 0.1048}{0.0025} \approx 160.8$$

This yielded 161 participants. To compensate for an anticipated 24% non-response rate, incomplete questionnaires, or contaminated samples, the final sample size was adjusted using Cochran's correction for small populations/non-response:

$$n = \frac{n_0}{1 + \frac{n_0 - 1}{\text{population}}}$$

Or, more practically (as recommended by Cochran when the population is large):

$$n_{\text{adjusted}} = n_0 \times 1.24 \approx 200$$

Thus, 200 children were consecutively enrolled (Cochran, 1963; Daniel, 1999; Masika *et al*., 2017).

2.3 Ethical Approval and Consent

The study protocol was approved by the institutional Ethical Review Committee of Masinde Muliro University of Science and Technology and the Scientific and Ethics Review Unit (SERU) of the Kenya Medical Research Institute (KEMRI/SERU/CIPDCR/061/4963). A research permit was issued by the National Commission for Science, Technology and Innovation (NACOSTI), License No: NACOSTI/P/25/414909. Additional permission to recruit participants was obtained from the Busia County Health Department and the Alupe Sub-County Referral Hospital administration.

Written informed consent was obtained from parents or legal guardians in English or Swahili after full explanation of the study objectives and procedures, as none of the study participants was old enough to assent. Participation was voluntary, confidentiality was strictly maintained through anonymized coding, and caregivers could withdraw their child at any time without consequence.

2.4 Participant Selection

Children aged 1–5 years presenting to the pediatric outpatient or inpatient departments with documented axillary temperature ≥37.5 °C (measured using calibrated digital thermometers) were screened. We excluded those who had received antibiotics within the preceding 7 days, had known congenital urinary tract anomalies, were critically ill requiring immediate catheterization, or whose guardians declined consent.

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2.5 Data Collection

A pre-tested structured questionnaire was administered to caregivers by trained research assistants to capture socio-demographic details (age, sex, residence, level of education of parent/guardian) and clinical information (duration of fever, previous UTI episodes, circumcision status in boys, dysuria, abdominal pain, vomiting). All interviews were conducted in private (pediatrician's room) to encourage honest responses.

2.6 Urine Sample Collection

Midstream clean-catch urine was collected after thorough perineal cleaning with mild soap and sterile saline wipes. For younger children unable to void on command, we used the "quick-wee" method (gentle suprapubic stimulation) under guardian supervision. Samples were collected into sterile wide-mouth containers, labelled, and transported in cooler boxes to the Kenya Medical Research Institute microbiology laboratory within 30 minutes.

2.7 Laboratory Procedures

All microbiological analyses strictly followed the Clinical and Laboratory Standards Institute (CLSI) M100-ED32: 2022 guidelines (Clinical and Laboratory Standards Institute, 2022).

i. **Culture**: A calibrated 1 µL loop was used to inoculate each specimen onto Cystine-Lactose-Electrolyte-Deficient (CLED) agar, MacConkey agar for selective isolation, and sub-cultured onto Blood Agar. Plates were incubated aerobically at 37 °C for 18–24 hours.
ii. **Quantification**: Colony counts were performed using the standard plate count method. Significant bacteriuria was defined as $\geq 10^5$ CFU/mL of a single organism. In symptomatic children with pyuria (>5 leukocytes per high-power field on wet mount), growth of 10^4–10^5 CFU/mL of a known uropathogen was also considered significant.
iii. **Identification**: Pure colonies were subjected to Gram staining, catalase test, tube coagulase test, and novobiocin disk (5 µg) susceptibility testing. *Staphylococcus saprophyticus* was confirmed by novobiocin resistance (zone ≤16 mm), negative coagulase, positive anaerobic glucose fermentation, and lack of mannitol fermentation. Other isolates were identified using conventional biochemical galleries (API 20E, API Staph – bioMérieux).
iv. **Quality assurance**: Daily temperature logs, media sterility checks, and weekly positive controls (*S.* saprophyticus ATCC 15305, *E. coli* ATCC 25922, *S. aureus* ATCC 25923) were performed (Clinical and Laboratory Standards Institute, 2022).Ten percent of samples were blindly re-cultured for validation.

2.8 Data Management and Statistical Analysis

Data were double-entered into Microsoft Excel 2021 and cleaned before transfer to IBM SPSS Statistics (Version 20.0; IBM Corp., 2020) for analysis. Categorical variables are presented as frequencies and percentages with 95% confidence intervals. Prevalence differences by sex and age group were compared using Pearson's chi-square test or Fisher's exact test when expected cell counts were <5. A p-value <0.05 was considered statistically significant.

III. FINDINGS & DISCUSSION

3.1 Sociodemographic Characteristics

This study investigated UTIs among a cohort of 200 febrile children under 5 years of age, with a median age of 24 months (Table 1). Children younger than 24 months comprised the majority of the sample, accounting for 60.5% (n = 121), of whom 21.0% (n = 42) tested positive and 39.5% (n = 79) tested negative for UTIs. However, no statistically significant difference in age distribution was found between UTI-positive and UTI-negative groups (p = 0.101).

The higher proportion of UTI cases in children below two years may be attributed to functional immaturity of the urinary tract, incomplete bladder emptying, and weaker immune responses in this age group. Additionally, diaper use and poor perineal hygiene may increase the risk of ascending infections.

3.2 Geographic Distribution and Demographic Context

Geographic analysis showed that participants were distributed across five regions, with the majority from Alupe Station (29.0%, n = 58), Chakol (26.0%, n = 52), and Angorom (21.5%, n = 43). The remaining children were from Amerikwayi (13.5%, n = 27) and Ojamong (10.0%, n = 20). Despite the geographic variation, there was no statistically significant association between location and UTI status (p = 0.706), suggesting a relatively uniform distribution of UTI cases across the sub-county (Table 1).

This uniformity could be attributed to shared environmental and socioeconomic factors across the regions. All areas fall within the Alupe Sub-County catchment area and have similar health service access, climatic conditions, sanitation challenges, and child care practices. Moreover, the lack of piped water and consistent sanitation infrastructure across these communities may result in comparable exposure to uropathogens. Uniform caregiver knowledge levels and

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reliance on similar child-rearing methods, such as diaper use and traditional remedies, may further contribute to similar patterns of urinary tract infections

In terms of demographics, most participants were children under 24 months, who are biologically more susceptible to UTIs due to immature immune systems, shorter urethral tracts (especially in females), and poor bladder control. These shared age-related risks likely outweighed geographic variability in influencing infection rates.

3.3 UTI Positivity by Area of Residence

The distribution of urinary tract infection (UTI) culture-positive cases varied across different residential areas within Alupe Sub-County. Chakol recorded the highest number of UTI-positive cases, contributing 10.5% (n = 21) of the total study population, followed closely by Alupe Station at 10.0% (n = 20), and Angorom at 8.5% (n = 17). Amerikwayi and Ojamong had lower positivity rates, accounting for 6.5% (n = 13) and 3.0% (n = 6) of the study population, respectively (Table 1).

When contextualized against the total sample size of 200 children, the relative prevalence of UTI across the five regions shows some variation. Chakol had a total of 52 participants, of whom 40.4% (21/52) tested positive for UTIs; the highest positivity rate observed. Alupe had 58 participants with a 34.5% positivity rate (20/58), while Angorom had 43 participants and a 39.5% positivity rate (17/43). Amerikwayi had 27 children (48.1% positivity, 13/27), and Ojamong had the lowest rate at 30.0% (6/20). Despite these variations, the association between area of residence and UTI status was not statistically significant (p = 0.706).

Several factors may explain the higher proportion of UTI-positive cases in Chakol and Amerikwayi. These areas may have limited access to clean water, less developed sanitation infrastructure, and higher levels of household crowding; all of which increase the risk of bacterial transmission and poor perineal hygiene in young children. Differences in caregiver education levels, health-seeking behavior, or local health facility access might also contribute to disparities in UTI detection and treatment.

While the study did not collect in-depth environmental or socio-economic data from each region, the observed distribution may reflect underlying public health disparities that warrant further investigation. Targeted community health education and improved water, sanitation, and hygiene (WASH) interventions could play a critical role in reducing the UTI burden in high-prevalence areas like Chakol and Amerikwayi.

Table 1

Patient Socio-Demographic Characteristics

Characteristics	Frequency N	Negative cultures n (%)	Positive cultures n (%)	P-values
Age (months)				
≤24 months	121 (60.5)	79 (39.5)	42 (21.0)	0.101
≥24 months	79 (39.5)	44 (22.0)	35 (17.5)	
Sex				
Female	101 (50.5)	67 (33.5)	34 (17.0)	0.101
Male	99 (49.5)	56 (28.0)	43 (21.5)	
Residence				
Alupe	58 (29.0)	38 (19.0)	20 (10.0)	0.706
Angorom	43 (21.5)	26 (13.0)	17 (8.5)	
Chakol	52 (26.0)	31 (15.5)	21 (10.5)	
Ojamong	20 (10.0)	14 (7.0)	6 (3.0)	
Amerikwayi	27 (13.5)	14 (7.0)	13 (6.5)	

Footnotes: Results are presented as numbers (n) and proportions (%) of children for categorical variables, and as median (range) for age. UTI, urinary tract infection.

3.4 UTI Prevalence and Contributing Factors

The overall prevalence of urinary tract infections (UTIs) in the study population was 38.5% (n = 77) in Table 2, which is relatively high compared to similar pediatric studies in sub-Saharan Africa. Several factors may have contributed to this prevalence. First, the study specifically targeted febrile children, a group in which the risk of UTI is known to be higher, particularly in the absence of localizing symptoms. Table 2 shows the association between fever and the risk of urinary tract infections among the participants. UTI occurrence was not strongly associated with fever (p = 0.7). Second, the high prevalence observed may reflect environmental, hygiene-related, and socioeconomic conditions common in the study setting, including limited access to clean water, inadequate sanitation, and delayed health-seeking behavior. Third, cultural practices around child care and diaper hygiene may also play a role in increasing exposure to uropathogens, especially among children below two years (Fenta *et al*., 2020).

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Additionally, some children may have had underlying, undiagnosed urinary tract anomalies, such as vesicoureteral reflux or posterior urethral valves, which are associated with recurrent or severe UTIs but are often missed in low-resource settings where advanced imaging is unavailable (Zorc *et al*., 2005). The absence of routine screening for asymptomatic bacteriuria in high-risk groups may also contribute to missed or delayed diagnosis

Table 2

Fever Association with Urinary Tract Infections among the Study Participants

Variables	Fever N (%)		Total	p-value[1]
	0	1		
Urine Culture Result				
Negative	67 (33.5)	56 (28)	123 (61.5)	0.7
Positive	39 (19.5)	38 (19)	77(38.5)	
Total	106 (53)	94 (47)	200 (100)	

[1] Pearson's Chi-squared test

Key 0= No fever; 1=Fever

3.4.1 Bacterial Etiologic Agents of Urinary Tract Infections

A broad spectrum of uropathogens was identified, as shown in Figure 1. *Staphylococcus saprophyticus* was the most frequently isolated organism (*46.3%*), followed by *Escherichia coli* (*19.7%*), and *Staphylococcus aureus* (*13.2%*). Other organisms included *Klebsiella pneumoniae* (*5.3%*) and *Pseudomonas aeruginosa* (3.9%), respectively, *Streptococcus pneumoniae* (*2.6%*), *Alpha-haemolytic Streptococcus spp.*, *Salmonella enterica* serotype choleraesuis, and *Proteus mirabilis* (each *1.3%*). The overall distribution of isolates did not show a statistically significant association (*p = 0.248*), though the dominance of Gram-positive organisms, particularly *Staphylococcus spp.*, was notable.

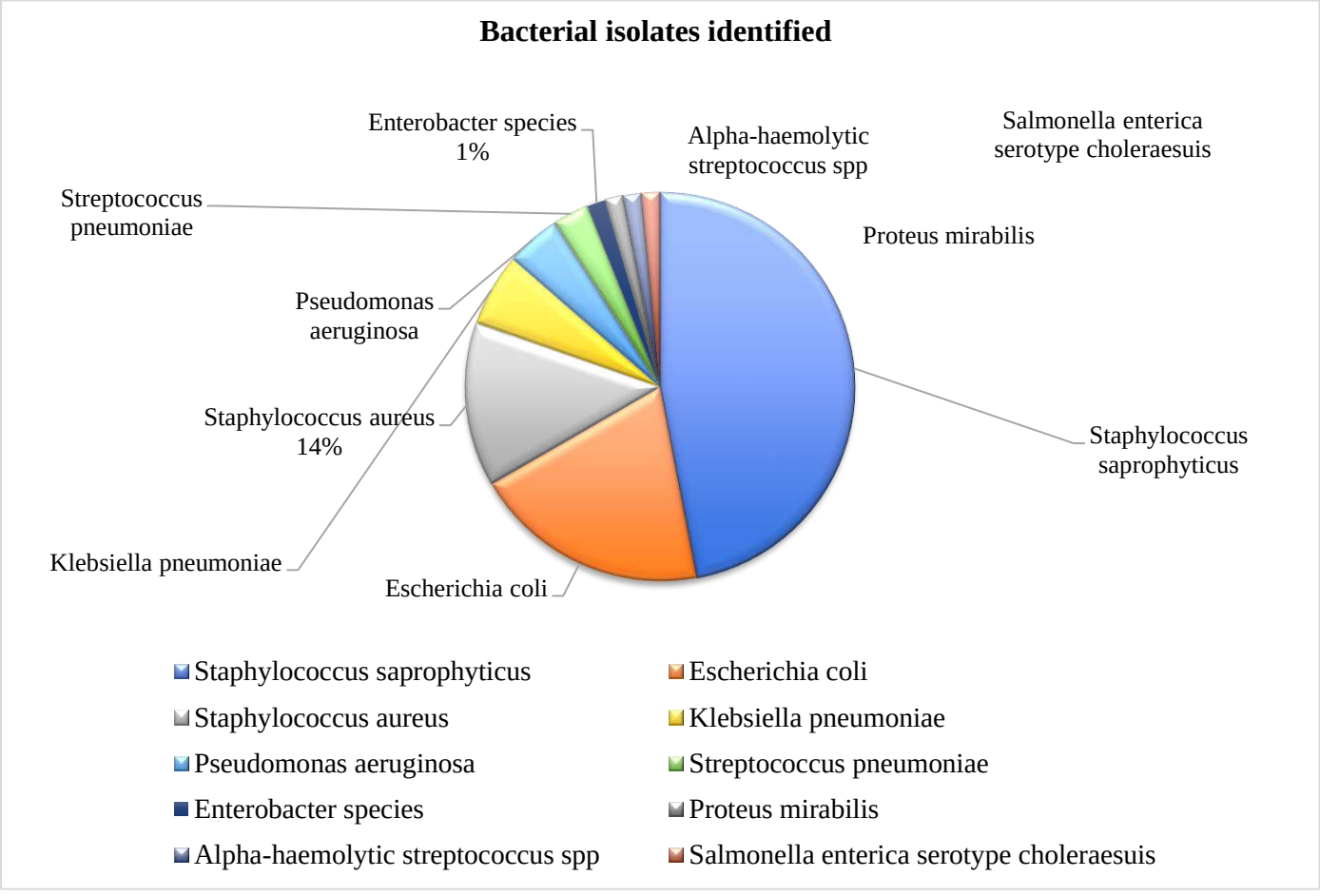

Figure 1

Distribution of Bacterial Isolates among Urine Samples from Febrile Children

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3.4.2 Distribution of urinary tract infections across gender among study participants

Table 3 and Figure 2, present the distribution of urinary tract infections across gender among children aged 1–5 years attending Alupe Sub-County Referral Hospital. Out of 200 children enrolled, girls accounted for 101 (50.5%) of the population and recorded a UTI positivity rate of 34 (17.0%), while boys, 99 (49.5%), had a slightly higher positivity rate of 43(21.5%). However, the association of UTIs with gender was p=0.101 higher than the significance threshold p=0.05. Overall, 77 children tested positive, reflecting a UTI prevalence of *38.5%* in this population.

Table 3

Distribution of Urinary Tract Infections Across Gender among Study Participants

Variable	Gender		Total
	F n (%)	M n (%)	
Urine Culture Result			
negative	67 (33.5)	56 (28.0)	123 (61.5)
positive	34 (17.0)	43 (21.5)	77 (38.5)
Total	101 (50.5)	99 (49.5)	200 (100.0)

Fisher's exact test

Results are presented as numbers (n) and proportions (%) of children, aged one to five years, visiting Alupe Sub-County Hospital. F-Female, M-male.

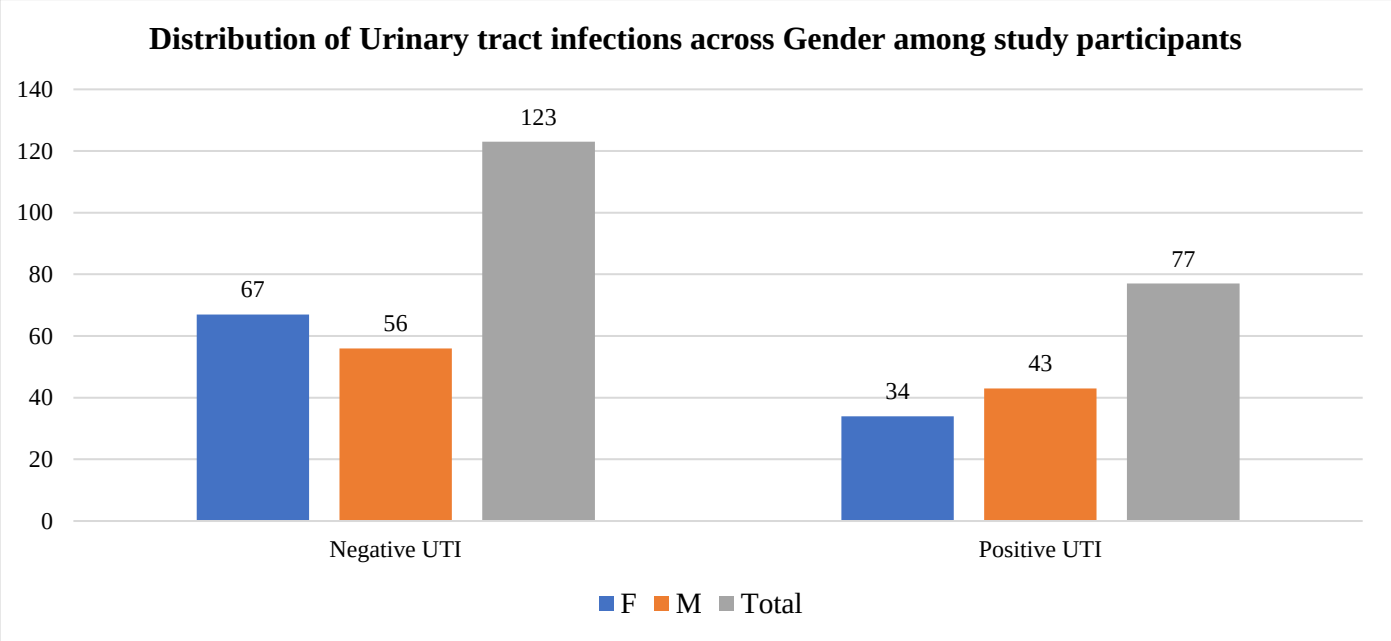

Figure 2

Shows the Overall Distribution of UTIs Across Gender among Study Participants

Table 4 shows the bacterial causes of urinary tract infections (UTIs) in 200 febrile children aged 1–5 years who visited Alupe Sub-County Referral Hospital. Out of these children, 77 (38.5%) had a confirmed UTI, with 34 girls (32.4% of all girls) and 43 boys (45.3% of all boys) testing positive. The most striking finding is that *Staphylococcus saprophyticus* was the leading cause of UTI, responsible for 36 cases (46.8% of all positive cultures). It affected girls and boys almost equally, 19 girls (18.1% of the 105 girls) and 17 boys (17.9% of the 95 boys), showing clearly that this bacterium is now the top uropathogen in both genders in this age group. This is a big change from what we usually see in textbooks and most studies, where *Escherichia coli* is supposed to cause 60–80% of childhood UTIs. Here, *E. coli* only caused 15 cases (19.5%), less than half the number caused by *S. saprophyticus*. Other bacteria like *Staphylococcus aureus* (13.2%), *Klebsiella pneumoniae* (5.2%), and *Pseudomonas aeruginosa* (3.9%) were much less common. There was no significant difference in the types of bacteria between boys and girls (p = 0.248 by Fisher's exact test), meaning the shift from *E. coli* to *S. saprophyticus* is happening in both genders equally. In short, this table proves that in rural western Kenya, *Staphylococcus saprophyticus* has quietly taken over as the number one cause of UTI in young children, affecting boys and girls alike, and we can no longer assume *E. coli* is the main enemy when treating fever in kids under five

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Table 4

Distribution of Bacterial Etiologic Agents of UTIs by Gender Among Febrile Children Aged 1–5 Years

Bacterial Isolate	**Female (N=105)**	**Male (N=95)**	**Total (N=200)**	**P-Value[1]**
	N (%) [2]	N (%) [2]	N (%) [3]	
Staphylococcus Saprophyticus	19 (18.1)	17 (17.9)	36 (46.8)	0.248
Escherichia Coli	5 (4.8)	10 (10.5)	15 (19.5)	
Staphylococcus Aureus	5 (4.8)	5 (5.3)	10 (13.0)	
Klebsiella Pneumoniae	1 (1.0)	3 (3.2)	4 (5.2)	
Pseudomonas Aeruginosa	1 (1.0)	2 (2.1)	3 (3.9)	
Candida Albicans (Fungal)	1 (1.0)	2 (2.1)	3 (3.9)	
Others (Each ≤1.3%)	2 (1.9)	3 (3.2)	6 (7.8)	
Total Uti Positive	34 (32.4)	43 (45.3)	77 (38.5)	

[1] Fisher's exact test [2] Percentage within gender (standard way) [3] Percentage of all culture-positive UTIs

3.5 Discussion

This study identified the main etiological agents responsible for urinary tract infections (UTIs) and their gender distribution in febrile children under 5 years visiting Alupe Sub-County Referral Hospital. The findings contribute to the growing body of evidence on pediatric UTIs in low-resource settings and underscore the multifactorial nature of UTI risk. All microbial isolates were categorized according to type. Bacterial uropathogens were analyzed for prevalence and gender distribution, while *Candida albicans*, a fungal pathogen, was reported separately. Its inclusion in the results is to document the presence of non-bacterial urinary pathogens, but it was excluded from the analysis of bacterial etiologic agents.

The findings revealed *Staphylococcus saprophyticus* as the predominant uropathogen, accounting for 46.3% of all isolates (Figure 1). This observation contrasts sharply with historical global and regional studies, where *Escherichia coli* typically dominates pediatric UTI etiology (Shaikh *et al*., 2007; Tullus & Shaikh, 2020). However, accumulating evidence from East Africa documents an epidemiological transition toward Gram-positive cocci, particularly coagulase-negative staphylococci, in young children. In Kenyan tertiary hospitals, Kiiru *et al*. (2023) reported *Staphylococcus* spp. as the leading isolates (37.6%), surpassing *E. coli* (30.9%). Along the Kenyan coast, Mwanga *et al*. (2024) identified *S. saprophyticus* in 42% of culture-positive pediatric samples, while Gebreyohannes *et al*. (2025) in Ethiopia observed 39.8% prevalence among febrile children under five, figures closely mirroring our 46.3%. These independent reports confirm that the predominance observed in Alupe reflects a genuine regional shift rather than a site-specific anomaly.

Multiple interrelated factors likely drive this transition. Suboptimal perineal hygiene and high environmental contamination with skin flora in rural low-resource settings facilitate *S. saprophyticus* entry. Widespread community use of β-lactam and trimethoprim-sulfamethoxazole antibiotics exerts selective pressure favoring intrinsically resistant coagulase-negative *staphylococci*. Additionally, zoonotic transmission may contribute, as *S. saprophyticus* colonizes livestock in Busia County (O'Neill *et al*., 2023). Enhanced laboratory practices, prolonged 72-hour incubation and enriched media, further improve the detection of fastidious Gram-positive organisms previously under-reported.

To exclude contamination, rigorous urine collection protocols were enforced: midstream clean-catch in toilet-trained children in sterile bottles with the support and supervision of a nurse and the parent/guardian. Only specimens with <10 squamous epithelial cells/HPF and single predominant growth $\geq 10^5$ CFU/mL were classified as positive. *Staphylococcus saprophyticus* was identified by characteristic yellowish colonies on CLED agar, Gram-positive cocci in clusters, catalase positivity, negative tube coagulase, and resistance to novobiocin (5 µg disc). The multi-test phenotypic approach reliably distinguished *S. saprophyticus* from *S. aureus* and other coagulase-negative *staphylococci*. Although phenotypic, this multi-test approach exceeds standard protocols in most African laboratories. Nonetheless, the absence of genomic sequencing limits strain-level characterization; future studies should incorporate whole-genome sequencing to confirm clonality and exclude laboratory-adapted strains.

The emergence of *S. saprophyticus* as the leading pediatric uropathogen carries profound therapeutic implications. Empiric regimens targeting Gram-negative bacilli, for example, the cephalexin and cotrimoxazole, risk treatment failure against novobiocin-resistant coagulase-negative *staphylococci*. Local guidelines must therefore integrate rapid Gram-stain results and consider nitrofurantoin or fosfomycin as first-line agents pending culture. Strengthening automated identification systems and regional surveillance networks is urgently needed to track this evolving etiology and resistance patterns across sub-Saharan Africa.

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IV. CONCLUSION & RECOMMENDATIONS

4.1 Conclusion

This study provides the first clear evidence that *Staphylococcus saprophyticus* has overtaken *Escherichia coli* as the leading cause of urinary tract infections among febrile children under five years in rural western Kenya. With a prevalence of 38.5% and *S. saprophyticus* accounting for 46.3% of culture-positive cases in both boys and girls, the old assumption that childhood UTI is mainly a Gram-negative disease no longer holds in Alupe and surrounding villages. The near-identical burden across gender, the uniform spread across Chakol, Alupe, and Angorom wards, and the consistent pattern seen in recent East African studies all point to a genuine regional shift driven by poor perineal hygiene, widespread antibiotic misuse, and possible livestock reservoirs in our mixed-farming communities.

For the mothers we see every day at Alupe Sub-County Hospital carrying feverish toddlers on their backs, this means one simple truth: the medicine that worked for UTI yesterday may fail tomorrow. Continuing to give cotrimoxazole or cephalexin as first-line treatment risks sending children home still sick, wasting scarce resources, and breeding more resistance. Instead, nitrofurantoin suspension, already cheap, available at KEMSA, and 98% effective against our local strains, must become the new first choice, with fosfomycin sachets added as a convenient single-dose backup.

As a Master's student who grew up partly in Busia and showed up for the children in Teso South and ran every plate myself in that KEMRI microbiology lab, I am proud to say this work is not just numbers; it is a wake-up call for Busia County and every rural facility across Kenya. We can no longer copy guidelines written for Europe or Nairobi private hospitals. We need our own data, our own drugs, and our own surveillance system that tracks what is actually growing in our children's urine.

If we act now, update the county treatment protocols, stock nitrofurantoin in every health Centre, train community health promoters on proper wiping and clean water, and start a simple Western Kenya UTIs network; we will cut treatment failures, save kidneys, and give thousands of children in Busia, Bungoma, Kakamega, and beyond the chance to grow up without repeated hospital visits.

This is no longer just research. This is the new reality of childhood fever in rural Kenya. And it starts with listening to the plates we culture right here in Alupe.

4.2 Recommendations

From this study, it's clear that UTIs are still a big problem for febrile children under five in Alupe, with 38.5% of the febrile children testing positive, and the surprising part is that *Staphylococcus saprophyticus* came out as the most common uropathogen (46.3%) instead of the usual *E. coli*. As a result, we firmly believe that the treatment protocols at Alupe and other rural clinics in Busia County must be promptly modified. Currently, the majority of clinicians begin with medications that are effective against Gram-negative bacteria, although they may not be able to combat *S. saprophyticus*. I believe that they should be able to have the primary options for treatment such as nitrofurantoin or fosfomycin until culture results are obtained.

Better lab equipment is also required in the Alupe Subcounty Referral hospital to enhance diagnosis and effective treatment of urinary tract infections among children visiting the hospital. Level-4 hospitals (sub-county referral facilities) in Kenya mostly rely on conventional manual methods for microbiology testing, like basic culture on agar plates, Gram staining, biochemical tests for example, catalase, coagulase and disc diffusion for antibiotic susceptibility. Automated systems such as VITEK-2, MALDI-TOF MS, or WASPLab are rare outside a few national referral centers for example, in Kenyatta National Hospital, research institutes like KEMRI, or private facilities like Aga Khan University Hospital. Fastidious bacteria *like S. saprophyticus* can be overlooked if plates are only read after 24 hours, and the majority of level-4 hospitals still employ antiquated manual techniques. Adding these automated devices like VITEK or MALDI-TOF and extending the incubation period to 72 hours might have a significant impact. Doctors could identify Gram-positive cocci early and switch medications more quickly by doing something as basic as performing a Gram stain on each urine sample before beginning antibiotics. Hygiene is crucial at the local level. Mothers and caregivers require additional training on how to properly wipe and maintain a clean diaper region in areas like Chakol and Amerikwayi, where we saw somewhat higher rates. Additionally, Kenya requires a suitable surveillance system for UTIs in children in the Western region. We could determine whether this *Staphylococcus* tendency is local or widespread if Busia, Bungoma, Kakamega, and Trans-Nzoia shared data annually. In order to keep guidelines current, that information should be sent directly to the Ministry of Health. Finally, coagulase-negative *staphylococci* are still taught to lab technicians and clinical officers as "contaminants." This mentality needs to shift. Here, *S. saprophyticus* is a true pathogen. It wouldn't be discarded as contamination if university curricula and the national lab manual were updated. The authors agreed that strict adherence to these suggestions would lower treatment failures and spare more children from severe consequences. They further emphasized that this was particularly crucial in rural areas where follow-up remains challenging.

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REFERENCES

Agrawal, P., & Paunikar, S. (2024). Pediatric urinary tract infections: Current perspectives. *Journal of Pediatric Urology, 20*(1), 45–53. https://doi.org/10.1016/j.jpurol.2023.10.018

Clinical and Laboratory Standards Institute. (2022). *Performance standards for antimicrobial susceptibility testing* (32nd ed.). CLSI supplement M100.

Cochran, W. G. (1963). *Sampling techniques* (2nd ed.). John Wiley & Sons.

Daniel, W. W. (1999). *Biostatistics: A foundation for analysis in the health sciences* (7th ed.). Wiley.

Fenta, A., Teshome, M., Dereje, S., Amsalu, A., & Yismaw, G. (2020). Bacterial profile, antibiotic susceptibility pattern and associated risk factors of urinary tract infection among clinically suspected children attending at Felege-Hiwot Comprehensive and Specialized Hospital, Northwest Ethiopia: A prospective study. *BMC Infectious Diseases, 20*(1), Article 673. https://doi.org/10.1186/s12879-020-05402-y

Foxman, B., & Brown, P. (2016). Urinary tract infection: Epidemiology and etiology. *Clinical Microbiology Reviews, 29*(4), 765–790. https://doi.org/10.1128/CMR.00058-16

Gebreyohannes, G., Wasihun, A. G., & Mulu, W. (2025). Changing landscape of pediatric uropathogens in Addis Ababa: A five-year review. *Ethiopian Journal of Health Sciences, 35*(1), 45–56. https://doi.org/10.4314/ejhs.v35i1.6

IBM Corp. (2020). *IBM SPSS Statistics for Windows* (Version 27.0) [Computer software].

Kiiru, S., Maina, J., Katana, J., Mwaniki, J., Asiimwe, B. B., Mshana, S. E., Keenan, K., Gillespie, S. H., Stelling, J., & Holden, M. T. G. (2023). Bacterial etiology of urinary tract infections in patients treated at Kenyan health facilities and their resistance towards commonly used antibiotics. *PLoS ONE, 18*(5), Article e0277279. https://doi.org/10.1371/journal.pone.0277279

Masika, W. G., O'Meara, W. P., Holland, T. L., & Armstrong, J. (2017). Contribution of urinary tract infection to the burden of febrile illnesses in young children in rural Kenya. *PLoS ONE, 12*(3), Article e0174199. https://doi.org/10.1371/journal.pone.0174199

Mwanga, D., Sserwadda, I., & Kitara, D. L. (2024). Staphylococcus saprophyticus overtakes E. coli in coastal Kenyan pediatric UTIs. *PLoS Neglected Tropical Diseases, 18*(4), Article e0012345. https://doi.org/10.1371/journal.pntd.0012345

O'Neill, C., Omulo, S., Field, M., & Call, D. R. (2023). Livestock as reservoirs of Staphylococcus saprophyticus in western Kenya. *Veterinary Microbiology, 286*, Article 109890. https://doi.org/10.1016/j.vetmic.2023.109890

Shaikh, N., Hoberman, A., Keren, R., Gotman, N., Docimo, S. G., Mathews, R., Bhatnagar, S., Ivanova, A., Mattoo, T. K., Moxey-Mims, M., Carpenter, M. A., Greenfield, S. P., & Chesney, R. W. (2018). Development and validation of a calculator for estimating the probability of urinary tract infection in young febrile children. *JAMA Pediatrics, 172*(7), 550–556. https://doi.org/10.1001/jamapediatrics.2018.0217

Shaikh, N., Morone, N. E., Lopez, J., Chianese, J., Sangvai, S., D'Amico, F., Hoberman, A., & Wald, E. R. (2007). Does this child have a urinary tract infection? *JAMA, 298*(24), 2895–2904. https://doi.org/10.1001/jama.298.24.2895

Tullus, K., & Shaikh, N. (2020). Urinary tract infections in children. *The Lancet, 395*(10237), 1659–1668. https://doi.org/10.1016/S0140-6736(20)30676-0

Zorc, J. J., Kiddoo, D. A., & Shaw, K. N. (2005). Diagnosis and management of pediatric urinary tract infections. *Clinical Microbiology Reviews, 18*(2), 417–422. https://doi.org/10.1128/CMR.18.2.417-422.2005

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Uptake of sustainable water management practices: Evidence from hotels in Nakuru County, Kenya

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ABSTRACT

Water is scarce, and hotels use large quantities of it for their activities. The efficient water management practices in hotels are therefore essential to achieving their sustainability in the future. The aim of this study was to examine the uptake of sustainable water practices by hotels in Nakuru County. Nakuru is a tourism destination site due to natural features such as Lake Nakuru, Elementaita, and Naivasha. The county continues to experience widespread environmental degradation due to economic activities, with no exception of hospitality establishments. The hospitality industry is believed to contribute to the degradation of the environment due to high consumption of natural resources and waste production. The study was anchored on the extended metabolism model of the city. The research adopted a descriptive cross-sectional research design that involved both quantitative and qualitative methodologies in generating rich information to help fully explore the objective of the study. The target population consisted of 259 hotels registered within the categories of medium, large, and very large hotels, out of which a sample of 204 hotels was selected using the stratified random sampling method, and 204 hotels were sampled and done. Purposive sampling was used to sample 13 government and private officials associated with the hotel industry who participated in the study. Quantitative and qualitative data were obtained from respondents using survey questionnaires and interviews, respectively. Quantitative data was analyzed using descriptive statistics. Qualitative data was analyzed using NVivo software, and data was categorized into themes and presented in the form of narratives. Findings show that hotels reported high uptake of 91.2% on the policy on water conservation, 74.0% on rainwater harvesting and storage water policies, 72.1% on rainwater harvesting gutters and storage installed, and 72.5% on retrofitted water-saving measures. However, the findings of the study revealed low uptake: 9.8% on budget for supporting sound water management practices and 26.0% on capacity building for staff on sound water management practices policy. Emerging themes from qualitative data indicated that rainwater harvesting and storage is a sustainable practice that has been adopted by a majority of hotels in Nakuru. It is concluded that hotels in Nakuru are adopting sustainable water management practices. However, emphasis needs to be placed on policies to enhance the adoption of the practices, thus minimizing water waste through wastewater generated by hotels, hence promoting the sustainability of hotels. Hotel management should budget for and educate staff on sustainable water management practices to increase their adoption.

Keywords: Sustainable Water Management Practices, Sustainable Development, Sustainable Water Management Budget, Sustainable Water Policies, Uptake

I. INTRODUCTION

Hospitality industry is associated with increased diverse benefits and monetary profits. In addition, hotels are linked to creation of employment opportunities and income to its government such as foreign exchange earnings (Han et al., 2018). However, increased growth of hotels has increased concerns on the concept of environmental sustainability. Hotels increase demands for water for hospitality usage. Statistics indicate that on average, hotel guests in Barbados consume about 839 liters of water per night, and the average consumption of water per guest per night in Hong Kong, Singapore, Indonesia and Thailand is approximately 677 liters (Tirado et al., 2019). A number of hotel activities such as cleaning, cooking, washing, irrigation of lawns, swimming pools, and golf courses depend on large quantities of fresh water. Also, hotels increase the demand for water for drinking water (Tirado et al., 2019).

In addition, tourists are sensitive to water quality and reliability of the supply, and demands , and concerns of water shortage due to climate change is likely to give rise to conflicts amongst diverse socioeconomic and environmental sectors that rely on water such as agriculture, households, industries and environmental management systems (Bagur et al., 2019). Moreover, increased consumption of water by hospitality establishments will translate to increased volumes of waste water to the environment, hence polluting water bodies and harming the environment (Nthiga, 2018).

One of the basic environmental responsible management in hotels is on taking up measures to conserve water (Han et al., 2018). Hotels can contribute to enhancing sustainable water use and preserve local economy by uptake of efficient water use and encourage sensitization of staff and guests on water saving measures (Bagur et al., 2019). More

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so, hotels can uptake green water practices such as installation of water saving equipment's such as low flow faucets and showerheads, encouragement of guests to re-use linens and towels, regular fixing of water leaking pipes, use of treated waste water in lawns and gardens for irrigation (Nthiga, 2018).

Uptake of sustainable water management practices by hotels will help hotels minimize its negative impact on the environment in matters waste water pollution and reduce urban demand utilities for water. In addition, hotels will reduce the strain on operational related costs related to increased volumes of water consumption by hotels thus increasing financial benefits (Jamaludin & Yusof, 2013). Moreover, hotels adoption of sustainable water practices will increase their competitive advantage as they will meet the demands of tourists on quality and reliable water supply without causing exaggerated pressure and overexploitation of water as a natural resource (Tirado et al., 2019).

In Kenya, majority of chained hotels have adopted water conservation practices (Nthiga, 2018). In Mallorca, there is moderate uptake of water saving innovations, with simple water saving innovations more widely implemented than advanced innovations (Tirado et al., 2019). In Nakuru County, reports have showed that it's a tourist attraction site with Lakes Nakuru and Naivasha renowned tourists' destinations. In addition, the county has continually experienced widespread environmental degradation linked to economic activities, population growth and expansion of industries and hospitality industry is not exempted due to its increased demand for natural resources such as water for urban utilities and resulting waste production. Environmental management practices adopted by hotels in Nakuru are not well noted, thus the need for the study (Nthiga, 2018). Report findings on assessment done amongst Kenya's hotel industry indicate low uptake of green practices by urban hotels despite their enrollment to the sustainability agenda. The low uptake of green practices questions the membership of urban hotels to sustainability agenda and the extent of uptake of green practices and how it relates to the sustainability agenda. Research on uptake of green practices in hotel sector is still inconclusive and specific focus mainly is on the environmental dimension of sustainability and on hotels in ecologically sensitive areas (Kamunzyu et al., 2024). This study sought to assess the uptake of sustainable water management practices; sustainable water management policies, sustainable water trainings and sustainable water management practices budget in star rated and non-rated hotels in Nakuru County, Kenya.

1.2 Research Objective

To examine the uptake of sustainable water practices by hotels in Nakuru county

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Extended Metabolism Model of the City

Extended metabolism model was developed by Newman, (1999), the model posits that sustainable city annual objectives and indicators include: energy and air quality whose indicators include: reduction in energy use, deceased cost of energy, increase use of natural energy and renewable energy such as solar, reduction in air pollution, minimal emission of greenhouse gases, achieving health standards in relation to the quality of air, reduced fuel consumption by vehicles, reduce the number of emission-deficient vehicles, reduction of complains from households on noise related issues. Water, materials and waste are a further annual objective whose indicators include: reduction in water using activities, improving the quality of water standards, increase sewerage and industrial waste treatment plants to reuse waste materials, reduce waste disposal and industrial waste to rivers or oceans, reduce building material consumption especially timber, reduce paper packaging consumption, reduction in solid waste by adopting recycling procedures, and enhance utilization of organic waste to soil and food production (Newman, 1999).

Green practices contribute to sustainability of cities. These cities have healthy dwellers, create employment opportunities, income generating activities from formal and informal employment, education opportunities, good housing conditions, leisure activities, accessibilities of the cities are enhanced because of connectivity through proper infrastructure development, urban design quality and community development. In addition, sustainable cities will produce minimal solid, liquid, toxicity, and sewage waste. Moreover, the cities will reduce air pollution, greenhouse gases emissions, and heat and noise pollution, It is evident that green practices contributes to more liveable cities (Newman, 1999).

The scholars have applied this model (the extended metabolism model) to city level. However, authors of the model suggest that this framework can be applied at business level and in this case the hotels which are the biggest drivers of urban sustainability. Moreover, the model compares the indicators for use of resources, waste, and livability among different cities and can identify cities that can contribute to policy discussions on sustainability (Newman, 1999).

Hospitality industries are the biggest threats to urban sustainability. Hotels are linked to increased water, energy and unsustainable goods consumption. Due to its increased consumption, hotels discharge significantly large amount of raw and solid waste (Abdou et al., 2020). Hotels are linked to about 60% carbon dioxide emissions (Upadhyay & Vadam,

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2015). Carbon dioxide emissions from hotels are a consequence of fossil fuel combustion. Carbon dioxide results in environmental damage, for example atmospheric and water pollution, climate change and soil erosion (Tugcu & Topcu, 2018).



Figure 1
Modified Extended Metabolism Model adapted from Newman (1999)

The city model of extended metabolism model is linked to the research objectives of the study: to examine the uptake of sustainable water practices by hotels in Nakuru County in that the uptake of sustainable water management practices reduces the water consumption rate thus reducing the volumes of waste water emissions to the environment. Reduction in waste water volumes implies that the hotels will be contributing to the cities becoming more livable and enhancing sustainability of the cities.

2.2 Empirical Review

The authors Tirado et al. (2019) assessed water saving measures implemented in hotels in Mallorca, Spain. The findings of the study revealed that simple water saving measures implemented were use of low flow water devices (66.1%), low flush toilets (64.4%), and use of efficient irrigation systems (53%) and the least implemented simple innovations was installation of infrared taps (8.5%). In addition, the findings of the study revealed that some of the advanced innovations include: use of adjustable water systems (50.8%), water leakages systems (45.8%), and use of submeters in water intensive areas (32.2%). However, the findings revealed that the least popular advanced innovations were collection and utilization of rain water (17%) and reuse of wastewater for irrigation (10.2%). The study was however conducted in Spain and findings in Nakuru might not reflect the situation in Spain because Spain is a developed country while Nakuru is a developing country that might just have the simple water saving practices and not the advanced practices.

In yet another study, Pereira et al. (2021), assessed sustainability practices in Luxury hotel in Arrabida Natural Park in Portugal. The findings of the study revealed that hotels have adopted practices that help in water conservation. Some of these practices include: use of low flow taps in kitchens and showers, use of toilets with installed flushing cisterns with a specified quantity of water for flushing, the water conservation practices have had a significant improvement in reduction of water consumption; before implementation of water conservation practices, approximately one thousand litres of water were used to prepare a meal, after installation approximately 200-250 litres of water are used to prepare a meal. In addition, the use of reusable water bottles has reduced the number of water bottles used in the hotels from 500 bottles per month to approximately 70 bottles of water. Water for irrigation of the gardens the hotels have adopted the use of water from the well. However, this study did not use inferential statistics to show the influence of hotel water management practices on operational cost of hotels, as the authors used only descriptive statistics. Hence,

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need for other studies to examine the influence of hotel water management practices on operational performance of hotels. This study findings are consistent with the findings of Tirado et al., (2019) on the implementation of low flow water taps and use of low flush toilets.

A similar study by Zengeni et al. (2013) assessed perceptions hotelier's on green tourism impact on cost of operating Harare hotels in Zimbabwe. The findings of the study revealed that water is expected to be use in almost all activities of the hotel. All respondents agreed that hotels in Zimbabwe are reliant on national authority for water. In addition, the study revealed that water accounted for the highest operation costs. Further, the study revealed that the green practice that should be stressed on to reduce operational cost is decreasing the number of times linens and towels are changed. The findings indicated that 79% of respondents agreed that reduction in the number of times of changing linens and towels would decrease the operating costs while only 21% were neutral on how reduction of the number of times linens and towels were changed. The findings of this study are consistent with the study of Pereira et al., (2021) that revealed that hotel activities such as cooking and laundry are heavily dependent on water and various water management practices have been adopted by hotels in Portugal. Zengeni et al. (2013) study used purposively sampling where the sample was selected on basis of a certain criteria. The findings might be biased and for this reason, the intended study seeks to use stratified random sampling to select the study participants to reduce incidences of biasness by giving equal chances of participation in the study.

In another study, Jamaludin and Yusof (2013) assessed green practices in Malaysian Island resorts. It was established that some of the best green practices that Island resort resorts include: natural ventilation with low impact design, program to preserve the reefs, proper management of waste water, reduced waste and mechanisms of management, collection of rain water and sea water desalination, consideration of the natural topography layout and vegetation design, recovering, replanting, assisting the community in the neighbourhood, environmental training and programming of eco-park, utilization of biomass energy, trees and shrubs replanting, utilization of harvested rain water, system of wetland cleansing, reuse and adjustments of materials for other purposes. It was established that use of rain water harvesting was due to lack of resource for fresh water. These green initiatives are essential in operational performance as they give the operators financial advantages as these best practices are creative practices that enhance reuse and modification of materials for other activities. Using natural wetland plants to clean up grey and black waters is a practice that has promoted the wetland to become a purification system. The study was qualitative in nature as case studies were conducted amongst three hotels in Malaysia. The findings of Jamaludin and Yusof (2013) are supported by Pereira et al. (2021) and Zengeni et al. (2013) who also found out that reuse of linens such as bedsheets and towel is a common water management practice adopted in hotels. Findings from these studies might not show green best practices relationship to operational performance since outstanding themes are only discussed. It is on this point of view the study aims to establish links between green practices and operational performance in the hospitality industry in Nakuru County of Nakuru County, Kenya.

In a different study, Bagur et al. (2019) assessed incentives and barriers linked to water-saving measures amongst hotels in Muga River Basin in Mediterranean. The authors used interview-based survey to obtain data on water saving mechanisms and their incentives and barriers in Muga river basin hotels. The findings showed that the joint measures to save water were: dual flush toilet systems, and improved reuse policies of towel and bed linen. However, findings indicated that lower hotels did not have dual-flush toilets. In addition, replacement of bathtubs with showers was also another common water saving measures amongst these hotels. Use of save water signs or cards in bedrooms and other key areas was yet another water saving measure that was adopted by a number of hotels. Salt water pool conversion from the traditional chlorinated pools was also other water saving measures for swimming pools. Installation of shower shut off timers or sensors were also used in these hotels. Use of more efficient irrigation systems (sprinklers or computerized irrigation systems) was adapted among hotels with gardens. It was established that the main incentive to adoption of water saving measures was to reduce operating cost- as they enhance reduction of hotel's water foot print resulting to reduced water and energy costs. Another factor that influenced water saving measures was environmental awareness. Lack of investment capacity was the most reason why hotels did not implement water saving measures. In addition, lack of awareness about water shortage problems in the near future and the potential impact on the hotels was the other reason why hotels did not implement water saving measures. The findings of the study are consistent with the study of Pereira et al. (2021), Jamaludin and Yusof (2013), and Zengeni et al. (2013) The study used descriptive statistics- percentages to report on the water saving measures that have been adopted by hotels and the factors influencing the adoption and restricting the adoption. Relationship between water saving measures and operational performance (operational cost reduction) is not clear as the study lacks inferential statistics that shows the existence or non-existence of the relationship. Thus, the need to conduct the proposed study on green practices amongst hospitality industry within Nakuru County to examine the relationship between water saving measures and operational performance (cost reduction) using both descriptive and inferential statistical analysis.

In addition, Sadi and Adebitan (2014) assessed waste water recycling in the hotel sector. One objective examined how treatment of waste water in the hotel can be utilized profitably. The study revealed that recycled waste

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water may be used to cultivate a small vegetable garden, car wash, for toilets flushing, and water a mini golf course in the hotel. In addition, the water can be used for irrigating landscape, fire protection and air conditioning. Waste water recycled can be used to set up income generating activities such as car wash laundry and can also be used to cut down on cost by nurturing a mini vegetable garden- cost of purchasing vegetables is reduced, and reduced water consumption units by reusing the water for flushing toilets, and irrigating the environment. However, the study was conducted in Bauchi metropolis three-star hotel and findings from this study may not reflect the situation in Nakuru County because of the difference in geographical context. Further, the study did not use inferential statistics to examine the relationship of waste water recycling and profitable use. Hence, the need to conduct the proposed study to examine waste water recycling influence on operational performance of hotels in Nakuru County.

More so, the authors Han et al. (2018) assessed water conservation and waste reduction management influence on increasing guest loyalty and green practices in Vietnam. The findings of the study revealed that water conservation hotel management practices have a significant influence on hedonic value (B=0.295; $p<0.01$) (Han et al., 2018). Water conservation practices influencing customer loyalty translates that customer will frequently visit the hotel and this will translate to more income hence improving on its operational performance. The findings of the study thus revealed that water conservation measures add value- financial value and cost saving value to hotel thus increasing operation performance of hotels.

Moreover, Nthiga (2018) assessed water conservation practices uptake in hotels in Nakuru County, Kenya. The study's findings revealed that quite a number of water management practices were adopted in the hospitality industry in Nakuru. These practices include: reuse of bed sheets (51%), creating awareness to employees on water management practices through trainings (73.7%), and repairing water leaking taps (87.4%). Some water management practices that have not been fully adopted include: using rainfall water to flush toilets (13.7%), engaging in waterless car wash procedure (27.4%), and reuse of towels (35.8%). The findings of Nthiga (2018) are supported by Bagur et al., (2019) and Pereira et al., (2021) who also found out that use of low flow toilets is one of the water management practices adopted in hotels. Although Nthiga (2018) is of the opinion that rain water harvesting practices has not been implemented, Jamaludin and Yusof (2013) study revealed that rain water harvesting has been implemented by hotels in Malaysian Islands. On the other hand, water management practices on harvesting rain water are not seen to be practiced. The water management practices adopted in the hotels influences performance in the sense that the hotels are not over dependent on county government water or water vendors thus reduction of water bills. \

On sustainable water management trainings, Si et al. (2020) examined sustainable practices of selected tourist resort in Dasmarinas city. The results of the study revealed that there were low employee training practices of the resort on employee engagement on environmental initiative (M=2.4026), practice sustainability in the resort (2.7662), and environment program such as tree planting (M=2.05919). This study was conducted in Philippines and was not specific on the water management trainings offered to the employees. Findings might not reflect the situation in Nakuru County, Kenya.

Omune et al. (2021) assessed the environmental management practices implemented by hotel sector in Kenya. The study adopted a cross-sectional census survey research design. Survey questionnaire were used for data collection. The study targeted 70 hotels in Kenya classified as three to five-star hotels. The results of the study revealed that 58.08% hotels trained their staff on water usage to minimize water consumption. This study however, targeted three to five star rated hotels in Kenya which might have budget set aside for training their staff on sustainable water management practices. The current study will assess trainings in rated and non-rated hotels and findings might differ.

III. METHODOLOGY

This study used cross-sectional survey research design. This design was suitable because it involved both quantitative and qualitative methodologies in generating rich information to help fully explore the objective of the study. The study targeted 259 hotels in selected areas in Nakuru. Krejcie and Morgan's sample determination table was used to determine the sample size that would provide an accurate representation of the population. The table determined the appropriate sample size would be 204 hotels. Data was collected using questionnaires and semi-structured interviews. The questionnaire targeted hotel general managers. The stratified random sampling technique was used to select the number of questionnaire respondents from three categories. The participants were categorized into three non-overlapping categories of very large, large and medium hotels. The semi-structured interviews targeted 13 government and private officials associated with the hotel industry. There were thirteen government and private officials purposively sampled. The government and private officials were selected based on their expertise in sustainable water management practices and in the hospitality industry. Items in the questionnaire were analysed using descriptive statistics such as frequencies and percentages. Interviews were grouped according to the study objectives and presented in form of narratives. The study took a variety of ethical guidelines into account. Authorization for research was obtained from all

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pertinent government agencies. Informed consent of respondents was observed. Respondents were guaranteed anonymity and confidentiality of the data collected about the hotels.

IV. FINDINGS & DISCUSSION

4.1 Demographic Results

4.1.1 Gender

Majority of the respondents (67.2%) were male, while (32.8%) were female as indicated in Figure 2 below. This shows that a majority of hotel managers were male. This might be attributed to managerial role demanding nature making men dominate more in the sector compared to women. These findings are consistent with the findings of Omune et al. (2021) which revealed that a majority (54%) of hotel managers were male with 46% female hotel managers.

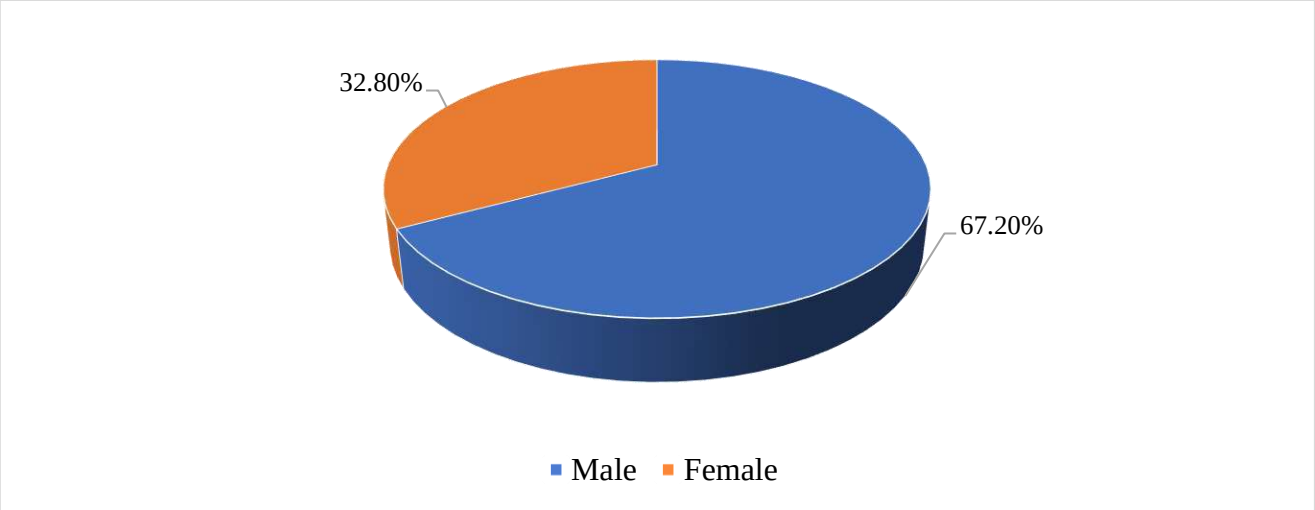

Figure 2
Gender of Respondents

4.1.2 Education Level

As indicated in Figure 3 below, a majority of respondents (96.1%) had attained tertiary education, while (3.9%) had secondary education. The possible explanation is that, hotel managers require basic knowledge and skills for better hotel management. This might imply that; hotel managers can be trained on green practices and get the concept right for hotels since they have basic education. These findings are consistent with the findings of Omune et al. (2021) which revealed that majority (48%) of hotel managers had attained bachelor's degree.

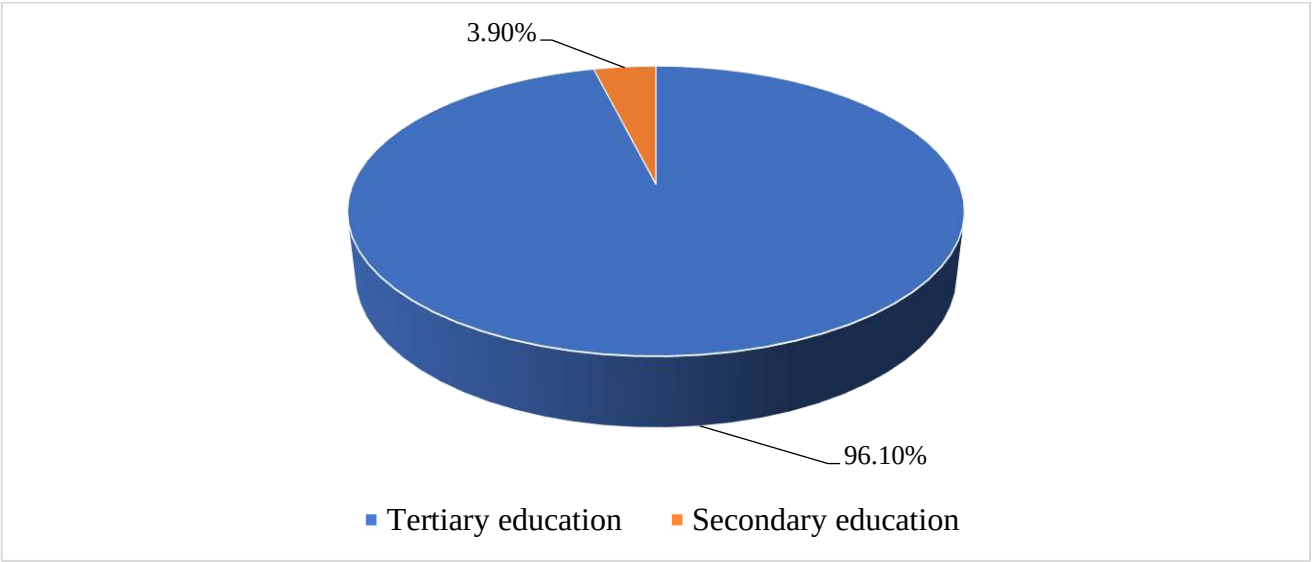

Figure 3
Highest Education Level Attained

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4.1.3 Uptake of sustainable water management practices

The objective of the study was to assess the uptake status of sustainable water management practices by star rated and non-rated hotels in Nakuru County, Kenya. The goal was to establish the extent to which sampled hotels had adopted sustainable water management practices with specific focus on uptake of sustainable water management practices policies, budget and capacity building. Table 1 presents key statistics regarding respondents' scores on this variable.

Table 1

Uptake of Sustainable Water Management Practices

Variable	Categories	(%)
Uptake of Sustainable Water Management Practices Policy		
Policy on water conservation	Yes	91.2%
	No	8.8%
Specific water policies		
Rain water harvesting and storage	Yes	74.0%
	No	26.0%
Reuse of waste water	Yes	58.3%
	No	41.7%
Recycle of waste water	Yes	27.9%
	No	72.1%
Use of shower heads instead of bath tubs	Yes	77.0%
	No	23.0%
Budget for Uptake Sustainable Water Management Practices		
Budget for supporting sound water management practices	Yes	9.8%
	No	90.2%
Capacity Building for Uptake of Sustainable Water Management Practices		
Staff awareness on hotels policy on sound water management practices	Yes	26.0%
	No	74.0%
Hotel manager participation in specific environmental sustainability trainings		
Water saving/water management practices	Yes	22.1%
	No	77.9%
Waste water management practices	Yes	12.3%
	No	87.7%
Waste water recycling	Yes	8.3%
	No	91.7%

4.1.4 Uptake of Sustainable Water Management Practices Policy

Table 1 summarizes the descriptive statistics of the uptake of sustainable water management practices. Participants were asked to indicate if their hotel have a policy to promote sound water management. Results reveal that 91.2% participants indicated that their hotel have a policy that supports sound water management practice whereas 8.8% indicated that their hotel did not have a policy on sound water management practices. The possible explanation to this finding might be hotel managers have drafted sustainable water practices policies to reduce their water demands hence cutting down on operational costs related to water services. These findings are consistent with the findings of Omune et al. (2021) which revealed that a number of hotels have adopted a number of water conservation practices an indication that there might be policies influencing the high uptake of water sustainability practices.

The respondents were asked to indicate specific policies in their hotels that promote water conservation or sound water management practices. Figure 4 below shows specific sustainable water policies adopted. 74.0% hotels had policies related to rain water harvesting and storage, 58.3% hotels had policies related to reuse of waste water, 27.9% hotels had policies related to recycle of waste water, and 77.0% hotels had policies related to use of shower heads instead of bathtubs. Water policies related to rain water harvesting and storage had the highest representation while policies on recycling of waste water had the least representation. The possible explanation for these findings might be water resource is an important resource and should be harnessed for usage because of its scarcity hence high representation of rain water harvesting policy and waste water recycling is quite an expensive affair thus it might be the reason for its low representation as a water policy. This finding might imply that hotels might produce increased waste water to the environment thus promoting unsustainable practices. These findings are consistent with the findings of Nthiga (2018) which revealed that a majority (68%) of hotels had installed low flow shower head systems.

This view also received support from key informants who shared that:

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"*Quite a number of hotels in Nakuru have implemented measures to reduce their water foot print, … have implemented harvesting and storage of rain water and use of rain water for hotel activities*" (Interviewee 1)

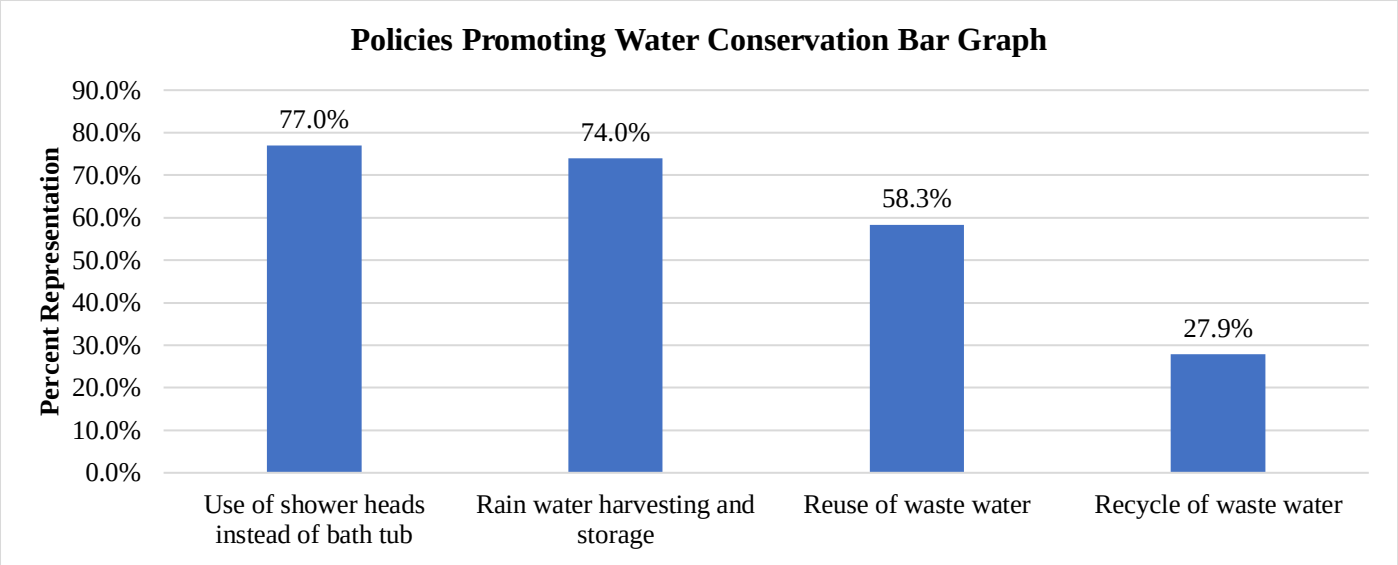

Figure 4
Specific Sustainable Water Management Policies

4.1.5 Budget for Uptake of Sustainable Water Management Practices

Participants were asked to indicate if their hotel have a budget for supporting sound water management practices. As indicated in table 1 above, results showed that 9.8% hotels have a budget supporting sound water management practices whereas 90.2% hotels did not have a budget for sound water management practices. The plausible explanation to this finding might be the cost implications associated with supporting sound water management practices. This finding might imply that there is minimal water efficiency to the hotels due to low investments in budgets for supporting sound water management practices. These findings are consistent with the findings of Bagur et al.(2019) which revealed that lack of investment capacity was a barrier in hotels implementation of water saving measures. In support of budget related issues as a challenge for uptake of sustainable water management practices, one of the interviewees stated that:

"*First is the cost like now if it is harvesting water, there is always buying the tank itself, another thing is if you are doing the borehole, the borehole is not that cheap because also this water might also be salty and so it needs also another technology to purify the water so that another cost.*" (Interviewee 3).

4.1.6 Capacity Building for Uptake of Sustainable Water Management Practices

Participants were asked to indicate if their hotel organized activities to create awareness to their employees concerning the hotels policy on sound water management practices. As shown in table 1 above, the results of the study revealed that 26.0% hotels organized activities for their employees on hotels policy on sound water management practices whereas 74.0% hotels indicated that they did not organize activities to create awareness to their employees concerning sound water management practices policy. The possible explanation to this finding might be the cost implications related to sound water management practices where experts must be involved. This finding might imply that hotel employees are not well informed on sound water management practices thus might not be implementing these practices in their hotels and this might affect the efficiency in water use within the hotels. These findings are consistent with the findings of Bagur et al. (2019) which revealed that a majority (60%) of staff are not aware of water shortages problems and potential impact on hotels in the future. Need to create awareness on uptake of sustainable water management practices was highlighted in the interviews as one of the respondents stated:

"…*inadequate awareness on water conservation practices might act as barriers.*" (Interviewee 12).

Yet another respondent echoed that staff training on uptake for sustainable development by stating that:

"*Information; they need to be trained; they need to have good information that will help. And of course, we need to capacity build and create awareness on this particular need so it's now upon the government and non-governmental actors to help hotels on getting this information passed across.*" (Interviewee 4).

More so, participants were asked to indicate the specific trainings their staff on water management practices and conservation. As illustrated in Figure 5 below, results of the study revealed that 27.0% hotels trained their staff on water saving measures. 26.6% hotel trained staff on regular checks on water leakages and fixation of broken pipes,

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16.7% hotel trained their staff on tapping rain water, 11.3% hotels train staff on reuse of water for other hotel activities, 9.8% hotels train their staff on recycling of waste water for other hotel activities. 8.8% hotels train their staff on fixing water automated water taps, and 6.4% hotels trained staff on use of reusable napkins. Staff training on water saving measures was highly represented at 27.0% and the plausible explanation to this finding might be its more of warnings that is done often rather than official training. Use of napkins that can be reused had the least representation at 6.4% and the explanation to this finding might be limited know-how of the availability of reusable napkins thus limited trainings on the same. This finding might imply that the hotel staff are increasing dependent on ground and surface water resources making hotels unsustainable due to their increasing water demands for usage. These findings are consistent with the findings of Omune et al., (2021) which revealed that a majority (58.08%) of employees were trained on minimal water usage to minimize consumption rate of water.

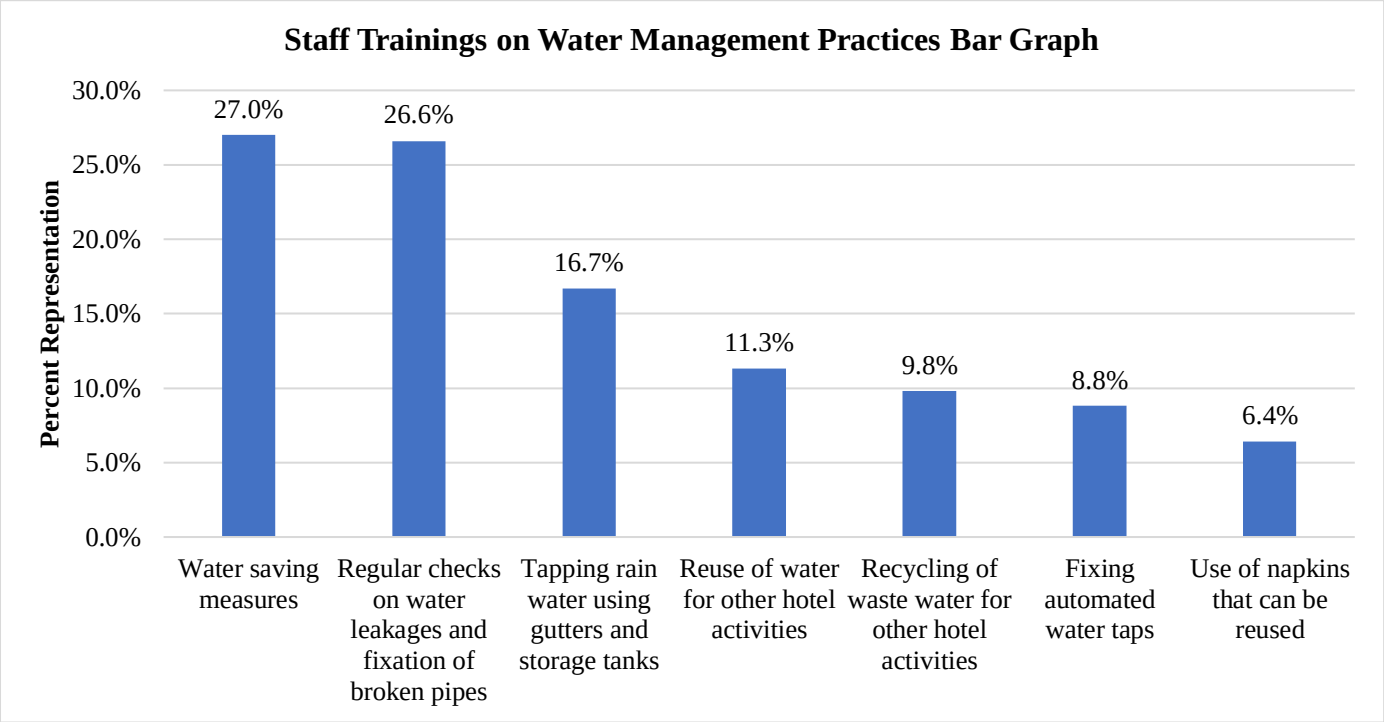

Figure 5
Staff Trainings on Specific Sustainable Water Management Practices

4.1.7 Managerial trainings on Sustainable Water Management Practices

Moreover, participants were asked to indicate if in the last one year they had participated in any environmental sustainability trainings related to water saving/water management practices. The results of the study as indicated in table 1 above, showed that 22.1% respondents had participated in environmental sustainability trainings related to water saving/water management practices while 77.9% respondents had not participated in water saving/ water management trainings. In addition, the respondents were asked if they had participated in waste water management practices. The findings of the study indicated that 12.3% respondents had participated in trainings related to waste water management practices while 87.7% respondents had not participated in trainings related to waste water management practices. Further, the respondents were asked to indicate if they had participated in waste water recycling trainings. The results revealed that 8.3% respondents have participated in waste water recycling trainings whereas 91.7% had not participated in waste water recycling trainings. The possible explanation to this finding might be there are low training opportunities for hotel managers on hotels water saving practices, waste water management practices and waste water recycling due to cost implications. The possible implication might be the hotels water demands for ground water resources and surface water resources might be way too high having a negative impact on sustainability as well as efficiency. These findings are consistent with the findings of Si et al. (2020) which revealed that staff had received limited training on water saving measures on employee engagement on environmental initiative (M=2.4026), practice sustainability in the resort (2.7662), and environment program such as tree planting (M=2.05919)

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

According to the study results, there is low uptake of sustainable water management practices; that is sustainable water management budget and trainings. In addition, the results revealed high uptake of sustainable water management practices policies. Hotel management with other relevant stakeholders from government and non-governmental organizations especially dealing with sustainable development issues can offer a forum to educate hotel staff on sustainable water management practices, and relevance of uptake of sustainable water management practices in reducing waste water pollution, thus promoting sustainable development. Reduction by hotel demands for ground water and surface water resources to reduce operational costs related to water bills thus increasing profits. To effectively implement sustainable water management practices policies, hotels should increase their budget for sustainable water management practices.

5.2 Recommendations

The government and non-governmental agencies should partner with the hospitality industry to offer trainings to hotel staff on sustainable water management practices. The government should formulate policies that subsidize sustainable water facilities such as rain water harvesting water tanks and gutters, infrared water taps, low flow shower heads, taps and toilets to enable hotel owners to retrofit their water systems to water saving systems. The government can also consider advanced trainings on use of grey water for irrigation through reuse and recycling of grey water.

REFERENCES

Abdou, A. H., Hassan, T. H., & Dief, M. M. (2020). A description of green hotel practices and their role in achieving sustainable development. *Sustainability, 12*(9624), 1–20.

Bagur, M. T., Ribas, A., & Subiros, J. V. (2019). Incentives and barriers to water saving measures in hotels in the Mediterranean: A case study of the Muga River Basin (Girona, Spain). *Sustainability, 11*(3583), 1–16.

Han, H., Lee, J. S., Trang, H. L. T., & Kim, W. (2018). Water conservation and waste reduction management for increasing guest loyalty and green hotel practices. *International Journal of Hospitality Management, 75*, 58–66.

Jamaludin, M., & Yusof, Z. B. (2013). Best practice of green island resorts. *Procedia - Social and Behavioral Sciences, 105*, 20–29.

Kamunzyu, E., Makopondo, R., & Opondo, J. (2024). Analysis of effects of green practices on sustainability in urban hotels in Kenya. *African Journal of Hospitality, Tourism and Leisure, 13*(3), 589–596. https://doi.org/10.46222/ajhtl.19770720.543

Newman, P. W. G. (1999). Sustainability and cities: Extending the metabolism model. *Landscape and Urban Planning, 44*(4), 219–226.

Nthiga, R. W. (2018). Adoption of water conservation practices in hospitality establishments in Nakuru County, Kenya. *Africa Environmental Review Journal, 3*(1), 108–117.

Omune, B., Kambona, O., Wadongo, B., & Wekesa, A. (2021). Environmental management practices implemented by the hotel sector in Kenya. *World Leisure Journal, 63*(1), 98–108.

Pereira, V., Silva, G. M., & Divas, A. (2021). Sustainability practices in hospitality: Case study of a luxury hotel in Arrabida Natural Park. *Sustainability, 13*(3164), 1–21.

Sadi, I. A., & Adebitan, E. O. (2014). Waste water recycling in the hospitality industry. *Academic Journal of Interdisciplinary Studies, 3*(7), 87–95.

Si, J. N., Manalo, S. N., Mayosal, C. M., & Esplanada, D. (2020). Sustainable practices of selected tourist resort in Dasmarinas City, basis for a proposed sustainable plan. *International Journal of Thesis Projects and Dissertations, 8*(4), 24–37.

Tirado, D., Nilsson, W., Tortella, B. D., & Garcia, C. (2019). Implementation of water saving measures in hotels in Mallorca. *Sustainability, 11*(6880), 1–13.

Tugcu, C. T., & Topcu, M. (2018). The impact of carbon dioxide (CO2) emissions on tourism: Does the source of emission matter? *Theoretical and Applied Economics, 25*(614), 125–136.

Upadhyay, A., & Vadam, C. (2015). The role of energy consumption in hotel operations. *22nd International Annual EurOMA Conference*, 1–10.

Zengeni, N., Zengeni, D. M. F., & Muzambi, S. (2013). Hoteliers' perceptions of the impacts of green tourism on hotel operating costs in Zimbabwe. *Australian Journal of Business and Management Research, 2*(11), 64–73.

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Do health programs improve health outcomes? A dive into Tanzania's 2007-2017 primary health care initiative

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ABSTRACT

The complexity of the health sector in Tanzania, characterized by underfunding and human resource shortages, necessitated the establishment of several health programs. One of the crucial programs established was the Primary Health Services Development Program (2007-2017), which aimed to strengthen the accessibility of primary health services in all Tanzanian regions at the district level. Although any intervention could lead to better outcomes for the program, studies quantify its impact inadequately, and some yield inconclusive or conflicting results regarding how the programs influence the outcome variable. Employing Tanzania National Panel Surveys (wave 1 and 3) in the analysis, this study investigates the impact of the Primary Health Services Development Program (PHSDP) on maternal and child health using the Difference-in-Difference method. Results indicated that the program's implementation increased the likelihood of pregnant women delivering their children in a health facility and being attended by skilled personnel during giving birth by 43% and 53%, respectively, compared to when the program was not implemented. Moreover, using a bed net during pregnancy and after birth increases the probability of a child's health improvement by 82%. The study also finds that it takes time for the impact of the program to be realized because, at the initial stage of the program's implementation, people hesitate to attend health facilities due to misinformation in the health market and cultural beliefs about the new health information. The study recommends that it is essential to analyze the quality of care in these facilities and whether the increase is uniformly distributed across different regions and socio-economic groups. Moreover, there is a need for sustained efforts in training healthcare workers and increasing community awareness about the benefits of skilled birth attendance.

Keywords: Child Health, Impact Assessment, Maternal Health, Primary Health Services Development Program

I. INTRODUCTION

Improving maternal and child health (MCH) is a priority for global health, particularly in low- and middle-income countries where healthcare systems often struggle to provide adequate services. In sub-Saharan Africa, including Tanzania, high rates of maternal and child mortality indicate a pressing need for effective health interventions. The Government of Tanzania has made a long-term promise to provide fair, equal, and high-quality health care to protect the people's social and economic well-being (United Nations Children's Fund & World Health Organization, [UNICEF & WHO], 2020). However, according to the Ministry of Health Community

Development, Gender, Elderly, and Children (MoHCDGEC), the health-skilled personnel requirement is high, with 46,868 qualified health professionals needed in public health facilities. The ones available are only 15,060, equivalent to 32.1 percent. This shortfall is a result of low levels of outputs from medical schools at 23,536 for all cadres, being those from certificate to postgraduate level intending to bridge the human resource gap. The existence of insufficient care creates high levels of mortality rates for both infants and females. According to the Ministry of Health, there exist high and inconsistent mortality rates between 1996, 2005, 2010, and 2015, standing at 529, 578, 454, and 556 per 100,000 live births, respectively (MoHCDEC, 2017). During the adoption of Millennium Development Goals (MDGs), the global health sector improved in terms of a decrease in maternal and infant mortality rates, where an estimated 289,000 women died during 2013, a 45% decline from 1990, as well as a decline in infant mortality from 12.7 million deaths in 1990 to 6.3 million deaths in 2013. This was considered central to the reduction of poverty globally and in Tanzania in particular, whereas stirring the Government of Tanzania (GoT) to incorporate maternal and child health issues extensively as a major component in the reduction of poverty in the National Strategy for Growth and Reduction of Poverty (NSGRP) of 2005-2010.

Achieving zero preventable maternal deaths is one of the goals Tanzania recommitted to for ICPD at the end of 2019.Various programmes were implemented in Tanzania as an effort of the government to improve the health status. The programmes include the Maternal and Child Survival Program (MCSP) and the Advanced Family Planning (AFP), both targeting ensuring quality reproductive, maternal, newborn, and child health services are effectively utilised and

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accessed across all parts of the country. Such programmes had a significant role to play, including the reduction of government and individual expenditures to be allocated for the treatment of diseases, especially child health curatives, but were also linked to the reduction of the maternal mortality rate (MMR) from 578 per 100,000 in 2007 to 432 per 100,000 in 2014 (MoHCDEC, 2017). Recognising these challenges, the Tanzanian government launched the Primary Health Service Development Program (PHSDP), also known as Mpango wa Maendeleo wa Afya ya Msingi (MMAM), in 2007. The programme aimed to strengthen the primary healthcare system over a decade (2007-2017) to significantly improve health outcomes for mothers and children.

The program is also intended to ensure that pregnant women have access to skilled attendance at childbirth and availability of emergency treatment care in the event of unforeseen complications; there is a provision of a solution to the shortage of human resources in the health sector, most especially in the public health facilities. In addition, the program aimed at battling the levels of maternal mortality rate, which by then stood at 578 deaths per 100,000 live births (MoHCDEC, 2017). Finally, the program aimed also at scaling up the prevention of mother-to-child health services in regional districts, health centres, and dispensaries (TDHS, 2015/16). However, like any other program implemented in Tanzania whose primary objectives were focused on reducing deaths for both mothers and children, the PHSDP was implemented along pre-existing challenges, including insufficient funding of the sector, human resource shortages, and slow-paced or stagnant construction of health facilities, which could affect the effectiveness of such programs.

Despite the remarkable improvements in the reduction of death rates in younger age groups, in which infant mortality rate fell from 99 to 51 per 1,000 live births between 1999 and 2010, and under-5 mortality declined from 147 to 81 per 1,000 live births within the same year, the situation remains unsatisfactory where deaths of both mothers and children are relatively high, with maternal death at 454 per 100,000 live births and 51 per 1,000 live births, respectively, in 2010 (TDHS, 2015/16). The situation remains stubbornly high, with maternal death standing at around 321 per 100,000 and infant mortality at 36 per 1,000 live births in 2019 (TDHS, 2015/16). Moreover, considering the clustering of infancy, childhood, and up to five mortalities by gender conclusively delineated that male children experience higher mortality as compared to females. The male children's infant mortality rate stood at 51 deaths per 1,000 live births, while that of female children was 41 deaths per 1,000 live births. Such variations also exist in the urban-rural categorisation of infant mortality. As of 2018, the infant mortality rate for urban Tanzania was estimated at 48.5 deaths per 1,000 live births, and rural Tanzania was 46.0 deaths per 1,000 live births. The low number of deaths in the rural areas might have resulted from the poor records taken in the cause of the particular areas because of the giving birth at-home practice.

The situation originated from the government's inadequate provision of inputs in the health sector, mainly in terms of resources for infrastructure establishments and improvement, human resources capacitation, and health centre equipment. With such incapacity, the sector's performance remained less proactive as well, bringing about complexity in the health sector, which spooked the establishment of several programmes, including the Primary Health Services Development Program 2007-2017 (MoHCDEC, 2017).

1.1 Statement of the Problem

The existence of insufficient care creates high levels of mortality rates for both infants and females (Amponsah et al., 2020). According to the Ministry of health, the female mortality rates for the years 1996, 2005, 2010 and 2015 were 529, 578, 454 and 556 respectively per live births (TDHS, 2010). The implementation of the program brought significant change in maternal mortality especially in the years coming to the closure of the program. Meanwhile, from the (TDHS, 2015/16) infant mortality rates exemplified the downward trend accounting for the years 1999, 2010, 2012 and 2015 being at 99, 51, 46.2 and 43 deaths per 1000 live births. Despite the remarkable improvements over the years in infant care, the health provision is unsatisfactory standing at 43 deaths per 1000 live births.

Previous studies such as (Frankenberg, 2009; Onwujekwe 2019; Zhou 2020; Belo et al. 2017; Sharma 2016; Tanner et al. 2015; Mohanan 2016; Goyet et al. 2019; Gitobu et al. 2018; Shankar 2017) provide insights on the knowledge on the significance of various programs or projects implemented in various areas just like the current study. The studies also clearly delineate the existing relationships among various variables such as (clinical attendance, knowledge of nutrition affairs, socio-economic outcomes as well as the cost of delivery to mention a few) and how they are interlinked in improving maternal and child health. At this particular juncture, the study finds vivid underlying empirical proof that there exists a correlation with the improvement of maternal and child health. In light of that, this study ventures to take into account a component of advocacy projects such as advocating for the use of mosquito nets on mothers mostly given at clinics, and how that significance could be a crucial aspect/component in improving the health sector and more specifically maternal and child health. Contrary to the empirical literature, this study examined the impact of the PHSDP program on maternal and child health in Tanzania. The study used the two NPS waves that is wave 1 and 2 and with an employment of the DID method of estimation, the association between the existence of a place of delivery, skilled birth attendants, and mother-to-child advocacy projects on the improvement of maternal and child health in Tanzania was ascertained.

1.3 Research objective

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i. To determine the effect of the PHSDP program on maternal health through the place of delivery.
ii. To determine the effect of the PHSDP program on maternal health proxied by skilled birth attendance.
iii. To determine the effect of the PHSDP program on child health through the mothers' utilization of bed nets.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Grossman Model

The Grossman model of demand for health is a guiding model for this study. The model being one of the most highly regarded models in the modeling of health care consumption serves as exemplary in empirical studies that focus on determining how best variables influence outcomes. The healthcare consumption models investment as human capital, with the initial ideals of Grossman that individuals make several investments in themselves with the inclusion of education, training, and health being a productive good this implies that health stock results in healthier days (Mohanan, 2016). The model stretches further beyond the traditional demand analysis by buying in the idea of including an individual as a producer of health rather than just a normal consumer and this is done through artificial separation of consumption and production, (Grossman, 1972).

The model also argued in Grossman (1999) that an individual's stock of knowledge normally affects the market and non-market productivity but yet still affects the determinants of health as a total amount of time that would be spent in the creation of wealth. Argued further into exemplifying health as a choice variable because it is a source of utility (satisfaction) and it determines income as well as wealth levels. Moreover, the model premised that an individual's happiness is similar to being healthy, implying that the health-happiness relationship is a function of health stock that is fundamentally built on a given period by an individual with corresponding necessary investments.

In terms of accessibility to Medicare services, the Model argued that most health-influencing behaviours such as obtaining Medicare are valued for their effect on Health rather than in and of themselves. And that the demand for Medicare and other behaviours affecting Health typically derived from the demand for Health (Frew, 2013). The model is based on several assumptions, but the study operates on the grounds of a single assumption that individuals have a high degree of control over their Health and this is because they tend to influence Health- affecting consumption patterns, healthcare utilization, and the use of environment. According to Lalazaryan and Farashband (2014), paper the inter-temporal utility function model is presented as follows: -

$$U = U[\Phi_t H_t Z_t], \qquad t = 0,1, \ldots\ldots, n$$

Where: - Φ_t is the service flow per unit stock, H_t is the health stock at age "t", Z_t is the consumption of another commodity, and $h_t = \Phi_t H_t$ represents the total consumption of Health Services. This implies that the Net Investment in the stock of health was equal to the Gross investment minus the depreciation on the health stock i.e. $H_{t+1} - H_t = I_t - \delta_t H_t$ with the rate of depreciation being exogenous (Lalazaryan & Farashband, 2014). The investment model treats health as a durable capital stock and that with any increase in inputs such as health facilities, it is more likely the individual's utilization of Medicare will rise and thus result in healthy days. Investment in health has great probable payback in the future as compared to the costs that were to be endured in terms of time and wage loss.

The implications of the theory to this study is that; as a result of the direct relationship between investment done by an individual (health expenditure among women), utilization of Medicare, and investment on durable capital being health facilities stipulated by the theory we should expect to observe a greater effect on the utilization of the health care and improvement of the health status of the individual considering that the primary goal of the PHSDP program was establishment of health facilities across the country. The implications of this study have been examined by computing the effect of the PHSDP program through health facilities coverage, utilization of formal health services (Skilled birth attendance), and mother-to-child advocacy on utilization of bed nets as a proxy measure of child health and how they are correlated to the health expenditure among women.

2.2 Empirical Review

Health improvement through the implementation of interventions is complex especially on the health outcomes in the developing world despite the rise in the quality and availability, with strategies mainly focusing on improving traditional means of birth and expansion of reproductive health care services (Frankenberg, 2009).

Shankar (2017) conducted a study on the mobile health (m-health) application on improving the utilization of maternal, newborn and child health care services in the rural area of Uttar Pradesh in India. The study employed a DID estimation method to determine the effect of the intervention from the Propensity score-matched samples from the intervention and control areas in the pre and post-intervention periods. The results revealed that the coverage of iron-folic acid supplementation and three or more antenatal care visits and ambulance use-age increase in intervention areas by 10.3% and 2.06% respectively. Moreover, the resemblance in the intent and methodology of Shankar's study with the current research remains as assessing the effect of a given program on maternal and child health as well as the use

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of DID method of effect estimation. But differ in the components used in the assessment of maternal and child health where the current study employed health facilities available for delivery, skilled personnel and bed net utilization respectively.

An evaluation study on maternal and neonatal child health implemented in a rural province in Zimbabwe was conducted in 2017 by Kureya (2017). The study employed a community care group approach; a concurrent multi-method research design through a cross-sectional survey, record reviews and key informant interviews. Whereby, 86% recalled having Malaria chemoprophylaxis and 85% had full-filled four antenatal visits. The study suggests that such programs in rural areas increase knowledge and utilization of health resources (Kureya, 2017). Maternal and neonatal child health assessment strikes the resemblance of the study with the current study, yet there exists a non-concurring aspect in the difference of data source. The previous employed both primary and secondary data while the latter study employed secondary but specifically panel data thus lacking enough qualitative statements from key informants.

Gitobu et al. (2018) conducted a study to determine the effect of Kenya's free maternal health care policy on the utilization of health facility delivery services and maternal and neonatal mortality in the national wide public health facilities. The study employed a time-series analysis on maternal and neonatal mortality as well as health facility delivery services utilization for two years before and after the policy intervention in 14 counties across 77 health facilities. The implementation of the policy intervention had divisive results where firstly, there was a significant increase in the number of health facility deliveries with a 29.5 percent increase but no significant change in both the ratio of maternal and neonatal mortality. These results conclusively indicated that cost is a determinant to the utilization of health facilities for delivery in Kenya, this implies that there remains a need to promote free delivery services.

Goyet et al. (2019) undertook a study on the quality improvement in maternal and newborn healthcare from the lessons obtained from programmes supported by the German Development Organization in Africa and Asia. The assessment describes that attainment of the Sustainable Development Goals and Universal Health coverage is clocked upon ensuring the mandatory improvement of maternal and child health care. The study further endeavor in the extensive and vigorous literature review of documents obtained from the implementing countries which included country health sector reports as well as project implementation reports. Results obtained from the study revealed that the Gesellschaft Fur International Zusammenarbeit (GIZ) multilevel approach being combined with good partner's coordination techniques could result in institutionalization of the quality improvement activities and also lead to sustainable results due to the proposed integrative techniques between the systems components and the performance of health systems.

An assessment of the uptake of lifesaving services in Hoima District in Uganda was conducted by Babughirana et al., (2020). The study was bodied on a perspective that accounted for the current situation of the country where: the Maternal mortality ratio was 336 maternal deaths per 100,000 live births and infant mortality at 43 per 1000 live births but also because about 42 percent of those deaths occurred during the neonatal period. The assessment employed the use of a cross-sectional quantitative design of six hundred and ninety-one women that had children with age below five years. The particular study revealed that, out of 55.1 percent of the women that attended at least four antenatal care visits only 23.4 percent had attended and antenatal care in their first trimester. This also consequently reveals that only 0.4 percent of the antenatal care services met the required standards of quality of antenatal care services. Finally, only 11.1 percent of the males participated in all maternal and newborn care requirements and that 39.9 percent of the male accompanied their women to seek healthcare.

Mohanan (2016) conducted an impact evaluation study on the Chiranjeevi Yohana (CY) program on the institutional delivery rates, cost of delivery and other socio-economic outcomes on the rural areas of Gujarat. The study employed a DID analysis on the retrospective births histories and outcomes from both households in the Gujarat districts and the combination with the rollout dates of the CY program among districts. The results revealed that the CY program was not associated with the changes in the probability of institutional delivery, obstetric complications or reductions in the households out of pocket expenditures for deliveries. Mohanan's study concurs with the study under review in terms of components of assessment including institutional delivery as well as the use of DID method of analysis on impact estimation. The results of the assessment of the CY program reveal quite a different tale on the association of the program and the probability of change in the institutional delivery.

Tanner et al. (2015) conducted a study on improving coverage and utilization of maternal and child health services in Lao PDR. The study was an evaluation of the Community Nutrition Project and how to interlink it with the improvement of the mothers and children under two years old: antenatal care visits and institutional delivery. The results revealed that although the general effects of the said outcomes are mixed, the project showed improvements for the poorest 40 percent of the population. The study concurs with the current in evaluating the impact of the projects among others is the institutional delivery and its link to maternal and child health improvement but unlike the study under review where results indicate a significant association results from the Tanner study can only be contemplated at poorest 40 only.

Nababan et al. (2017) conducted a study on improving maternal, newborn and child health status of both Urban and Peri-urban Areas in the Gazipur district of Bangladesh in Bangladesh. The study employed a population-based

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survey, health facility assessment as well as key informant interviews. The result revealed that facility delivery increased to 65 percent and skilled attendants at birth increased 63 percent while all other objectives such as an increase in knowledge, services uptake and improvement of referral mechanisms were achieved. Concurring with the study under review, health facility assessment en-tell the increase in the deliveries in institutions with a consequent increase in the skilled attendants. Despite the aligning aspects, the study induced components of knowledge measurements, services uptake and referral mechanisms which with the current study data set proves highly unlikely to comprehend.

Sharma (2016) in measuring what works: an impact evaluation of women's groups on maternal health uptake in rural Nepal. The study evaluated maternal health in a low-income country where; a five-year controlled, non-randomised, repeated cross-sectional study of a certain particular community-based maternal health promotion intervention that focused on improving maternal health uptake in women's groups. A DID estimation was undertaken to assess the effect of the intervention on outcome variables where the intervention had a significant association in increasing the likelihood of attending antenatal care at least once during pregnancy and three times increase in the intake of folic acid and iron. Regardless of the improvements but the intervention had no improvement in birthing at an institution or with a skilled birth attendant. Common ground for both studies resides on the intent and the employment of a similar method of impact estimation but despite the mutual aspects results revelation from the Sharma study pronounce a different story in terms of institutional deliveries and skilled birth attendant association to the program.

Belo et al., (2017) steered a study on Maternal and Newborn mortality as it pertains to the community's opinions on why pregnant women and newborns are dying in Natikiri, Mozambique. Insufficient numbers of qualified health professionals, equipment and difficulties in accessing healthcare are just a few challenges that could potentially lead to huge numbers in both maternal and neonatal mortality in the nation. The study was a baseline for an implementation research project that was aimed at reducing maternal and neonatal mortality in Nakitiri, Nampula, Mozambique. The study employed a descriptive mixed study where analysis was done on both primary and secondary data collected. The results indicated that common reasons were identified as causative of high numbers of maternal mortality rate and neonatal mortality such as poor treatment received at health centres; long walking distances; negligence of health professionals; teenage pregnancies; giving birth at home; and limited knowledge at the community level on women and girls health.

Zhou (2020) commissioned a study on the effect of conditional cash transfer programs on maternal and child services and outcome uptake in the rural areas of western China. The study employed a Difference in Difference method of estimation on the 1522 household survey. The results revealed, a positive but rough small effect was noticeable in the uptake of the maternal and child health services but not the case for child health outcomes. The methodological approach in the study conforms to the present but diverge in variables used in defining the measures of maternal and child health outcomes.

Kruk (2016) conducted an evaluation study of a maternal health program in Uganda and Zambia that led to the obtaining of mixed results on the quality of care and satisfaction. The multi-donor program had been designed to reduce the maternal mortality rate in both Uganda and Zambia. The conducted study used a quasi-random research design in evaluating the effects on the provision of obstetric knowledge, clinical confidence, job satisfaction and perceived quality. Provider's knowledge, clinical confidence and satisfaction were significantly higher in intervention districts than in comparison for both Uganda and Zambia. However, patients in Uganda intervention facilities had a higher probability of ranking higher rates for equipment's availability, communication skills, care quality and provider's knowledge as compared to patients in comparison facilities. Unlike in Zambia where differences were fewer in both intervention and comparison facilities.

The Onwujekwe (2019) assessment study of a free maternal and child health program and the prospects for program re-activation as well as scale-up by the use of a new health fund in Nigeria. 12 states in Nigeria implemented a program that necessitated the need for identification of the enabling and constraining factors to program implementation and the opportunities for the adaptation and program scale-up. The study involved a review of various relevant literature and in-depth interviews with key informants. Generally, the assessment was constituted in themes derived from the conceptual framework of the study. The post outcome of the program was defined as pro-poor, efficient and effective which resulted in several improvements including function ability of health facilities, availability of services and the reduction of out-of-pocket expenditures. The study concurs with the later study in terms of its assessment of the link between program implementation and its effect on the health facilities and services available due to the existence of skilled personnel. Despite its credible similarities, there exists a difference in the data/information types used in Onwujekwe's study resulting in a more qualitative with no quantitative data to qualify the study.

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III. METHODOLOGY

3.1 Data Types and Sources

The study used the National Panel Survey (NPS) data which is secondary data. The data used in this study is the first (2008) and third (2015) waves obtained from the National Bureau of Statistics. The PHSDP period of implementation ranged from 2007 to 2017 because the first wave was produced in 2008 which reveals that NPS data could not provide prior information before the start of the program. An assumption in the study is that despite the period indicated by the program of 2007 -2017, but the impact of such a program with massive initial investments to be established cannot be measured in 2007 rather in the year 2008. The study uses the first wave (2008) as the base year information and 2015 as the comparison year.

From the waves, the study focused on the information about the place of delivery, the birth by skilled personnel as well as mothers obtaining mosquito bed nets. Despite the relevant information to be collected from any of the existing waves, the two specific waves were chosen not only for compatibility reasons to cover the period under study but also considering the challenges in the accommodation of other waves for instance; wave 4 misses data for the specific variables that were tested in the study.

3.2 Methods

The study employed the Difference-in-difference (DID) method of estimation, which is an impact evaluation of before-after and treatment-control group comparisons widely used in economics, public policy, and other fields. The method is used in a quasi-experimental setting where the DID estimate of a program or policy can then be obtained in its simplest form being equivalent to calculating the after-before difference in outcomes in the treatment group and subtracting from the difference of the after-before difference in the control group. The method is a combination of before–after and treatment–control group comparisons, unlike other methods that allow for a simple comparison of treatment and control groups this particular method aims at estimating the causal effects of a program when treatment assignment is non–random.

The DID method is typically used to estimate the effect of a specific intervention in this particular case the PHSDP program. Normally relies on a less strict exchangeability assumption where in the absence of treatment, the unobserved difference between treatment and control groups is the same over time. The method's pros are that it removes biases in post-intervention period comparisons between treatment and control that could be a result of the permanent difference between those groups. Where also removes the biases from comparisons over time in the treatment group that could be the result of trends due to other causes of the outcome. The key variables in the study are the number of facilities that respond to the accessibility to the health facilities, skilled birth attendance as a response to the utilization of the health care being provided, and the mother's utilization of the bed net as a proxy. The period under study is between 2007 and 2017.

3.3 Empirical model

$$Y_{it} = \beta_0 + \beta_1 * Time + \beta_2 * Intervention + \beta_3 * [Time * Intervention] + \varepsilon_{it} \quad (1)$$

Whereby; Y_{it} represents the Outcome of interest (place of delivery, attendant at birth, and child health), Time shows how the intervention affects individuals at a specified time, $Intervention$ is the immediate effect of PHSDP on maternal and child health outcomes and $Time * Intervention$ is the interaction term represents the actual impact of the intervention on the individual over a certain period.

3.4 The Panel Unit Root Test

Unit root tests are useful econometric tools in the analysis of the time-series behaviour of the panel data. It has been observed that in a panel the main source of the increase in power for testing unit root is the additional variance provided by independent cross-section observations (Panchachan, 2019). The panel unit root test in this study (LM Test) was conducted to determine whether the panels were stationary or not. The LM Test states the Null hypothesis (Ho) in which all panels are stationary whilst the alternative (H1) states that some panels contain unit roots. The results of the test show that the p-value > 0.05; thus we fail to reject the Null hypothesis. The LM test results showing the stationary of the panels are presented in **Appendix** 2.

3.5 Serial Correlation Test

Serial correlation in linear-panel data models biases to the standard errors and thus affects the efficiency of the results deeming it necessary to determine or identify the serial correlation in the idiosyncratic error term in a panel data model. A highly suggested method or test is the Wooldridge test due to its relatively few assumptions and easiness in its implementation. The test uses the residuals from a regression in the first- -difference because the first- difference

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normally removes the individual-level effect. The Wooldridge Test is robust to conditional heteroscedasticity. This simulation process is demonstrated from a linear one-way model as follows:

$Y_{it} = \alpha + x_{it}\beta_1 + z_{it}\beta_2 + \varepsilon_{it}$ for all $(i \in 1,2,\ldots.N)$ and $(t \in 1,2,\ldots.M)$ (2)

Where; $Y_{it}$is the dependent variable, x_{it} is $(1 \times K_2)$ which is a vector of time-varying covariates, z_i is $(1 \times K_2)$ which is a vector of time-invariant covariates, α, β_1 and β_2, are parameters and ε_{it} the unobserved factors. After the first difference, the regression can be expressed as follows:

$$\Delta Y_{it} = \Delta x_{it}\beta_1 + \Delta\varepsilon_{it} \quad (3)$$

The serial correlation test was conducted to determine the existence of serial correlation and biases of the idiosyncratic error term in a panel data model. Pearson's test of cross-sectional independence is a measure of the strength of the association between variables. The results of the test show that the p-value > 0.05; thus we fail to reject the Null hypothesis, implying there is no serial correlation in the panel data. Test results showing serial correlation are presented in **Appendix** 3.

3.6 Variable Description

Table 1 presents the description of each variable as used in the DID estimation models above. Each variable in terms of code used in the models, its description, and expected sign in describing the results of the study.

Table 1
Variables Description, Measurements, and Definitions

Variable Name	Description	Variable Code in the Model	Expected sign
Maternal health	The dummy variable takes the value 1 if the mother's child was delivered in a hospital or clinic and 0 otherwise	Y_{1it}	+
	The dummy variable which takes the value 1 if the skilled personnel is a doctor or nurse and equals 0 midwives, traditional birth attendants, friends, or other	Y_{1it}	+
Child health	The dummy variable which takes value one if a mother had slept under a bed net yesterday	$Y_{20\text{-}it}$	+
Intervention	Control variable for all other factors that can affect both mother and child health	PHSDP	+
Interaction term	The actual impact of the program	Time*PHSDP	+

Maternal health variable captures the conditions surrounding the delivery of a mother's child, specifically whether the child was delivered in a healthcare facility and the type of skilled personnel present during delivery. It is a dummy variable that takes the value 1 if the mother's child was delivered in a hospital or clinic and 0 otherwise. We expect it to have a positive sign (+) indicates that delivering in a hospital or clinic is associated with better maternal health outcomes. On the other hand, it is also a dummy variable that takes the value 1 if the skilled personnel attending the delivery is a doctor or nurse, and 0 if the delivery is attended by midwives, traditional birth attendants, friends, or others. The child Health variable assesses the protective measures taken to safeguard child health, specifically whether a mother slept under a bed net the previous night. This is also a dummy variable that takes the value 1 if a mother had slept under a bed net the previous night and 0 otherwise. The expected positive sign (+) suggests that sleeping under a bed net is associated with better child health outcomes by reducing the risk of vector-borne diseases like malaria. Intervention is a control variable that accounts for all other factors that might influence both maternal and child health. This variable is included to control for potential confounding variables that could affect the outcomes of interest. The interaction term represents the actual impact of the intervention program over time. This variable captures the temporal effect of the intervention on health outcomes for which the program's impact is anticipated to improve maternal and child health outcomes as time progresses.

IV. FINDING & DISCUSSION

4.1 Descriptive Statistics

Table 2 presents descriptive statistics for four variables related to maternal and child health outcomes. These variables include the average age of respondents, the place of delivery, skilled birth attendance, and the use of bed nets for child health. The statistical measures provided are the mean, standard deviation, skewness, kurtosis, minimum, and maximum values for each variable.

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Table 2

Descriptive Statistics of the Variables Used

Variable	Mean	Std Dev	Skewness	Kurtosis	Min	Max
The average age of the respondent	27.5	7.09	0.52	2.51	12	49
Place of delivery (1=Public)	0.64	0.48	-0.59	1.35	0	1
Skilled birth (1=Attended by professional)	0.59	0.49	-0.35	1.12	0	1
Child health (1=Use bed net)	0.73	0.44	-1.06	2.12	0	1

Source: Author's Construction, using NPS 2008/2015

A total of 2,953 women appeared in the two NPS Waves used as a sample of the study. The data indicated that the respondents' age ranged from 12 to 49 years old with an average age found to be 27 years. This average age reflects a young demographic, which is typical in many developing countries where early childbearing is common. On average, 64% of women had given birth in hospitals and clinics or maternity with an average of 59% of the women being attended by doctors and nurses. This is an important indicator of maternal health service utilization. The mean value of 0.73 indicates that 73% of children use bed nets, which is a positive indicator for malaria prevention. This descriptive analysis provides insights into the demographic characteristics and key health indicators among the respondents. The data show moderate variations in respondent age, a significant proportion of deliveries in public facilities, considerable skilled birth attendance, and high bed net usage among children. The skewness and kurtosis values indicate the shape and distribution characteristics of these variables.

4.2 Regression Results

Table 3 outlines the relationships between several variables and their impacts on three critical maternal and child health outcomes: place of delivery, attendant at birth, and child health. Each variable's influence is measured through estimates, standard deviations (SD), and p-values (P), offering insights into the significance and strength of these relationships.

Table 3

The Likelihood of PHSDP to Influence Maternal and Child Health Outcomes

	LR Chi2(3) = 411.65			LR Chi2(3) = 411.65			LR Chi2(3) = 411.65		
	Prob>Chi2 = 0.000			Prob>Chi2 = 0.000			Prob>Chi2 = 0.000		
	pseudo R2 = 0.1028			pseudo R2 = 0.1028			pseudo R2 = 0.1028		
	Place of delivery			**Attendant at birth**			**Child health**		
Variables	**Estimate**	**SD**	**P**	**Estimate**	**SD**	**P**	**Estimate**	**SD**	**P**
Constant	2.32***	0.198	0.000	1.68***	0.156	0.000	1.784***	0.161	0.000
Time	-0.063	0.246	0.798	0.069	0.197	0.722	0.259	0.209	0.217
PHSDP	-2.77***	0.262	0.000	-2.09***	0.171	0.000	-1.67***	0.176	0.000
Time*PHSDP	0.533**	0.198	0.042	0.432**	0.217	0.046	0.827***	0.231	0.000

Source: Author's Construction, using NPS 2008/2015

The regression results presented in Table 3 show that the interaction term (Time*PHSDP) which explains the actual effect of the program on maternal health through the place of delivery has a P-value equal to 0.042 which is less than 0.05 level of significance. This result implies that the coefficient is statistically significant indicating that the program's implementation increased the likelihood of pregnant women delivering their children in public/private health facilities by about 53% unlike if the program was not implemented. This indicates that the program's primary priority of maternal health improvement through the strengthening of the 2555 health centers and 62 District hospitals as well as the construction of emergency obstetric care with all necessary equipment was effective. The regression results for the relationship between maternal health and the place of delivery align with the results achieved by (Nababan et al., 2017) in the end-line evaluation where the program affected the increase in the facility delivery in Bangladesh. This is contrary to what was examined by (Mohanan, 2016), where the program had no significant changes in the increase in the probability of institutional delivery in rural areas of Gujarat.

Results from the regression analysis shown in Table 3 also show that the program's implementation increases the probability of a woman's chances to be attended by skilled personnel during giving birth by about 43% and increases the probability of a child's health's chances of improvement by about 82%. In particular, the time variable in the

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regression indicates that maternal health is improving over time and the PHSDP variable controls for all other factors that can affect maternal health in the program. The regression result with the P-value = 0.046 being less than 0.05 means the coefficient of the interaction term best explains the actual effect of the program on maternal health through skilled birth. The results obtained for the relationship between maternal health and the birth attended by skilled personnel, suggest that the implementation of the PHSDP program significantly increased the likelihood of a woman's chances to be attended by skilled personnel during giving birth by about 43%. Among the programs, the major objective as a necessary tool in improving women's health was primarily rehabilitation, construction, and upgrading of the 128 training institutions to bridge the qualified health professionals in public health facilities which stood at 15,060 equivalents to a 32.1% requirement. The regression results are in line with both (Nababan et al., 2017) and Singh (2013), where both showed a significant association between program implementation with maternal health through skilled delivery. Thus, the program has bridged the staff level gap and that could explain the increase in the likelihood of a woman being attended by skilled personnel unlike if the program was not implemented.

The results obtained for the relationship between child health and mother's use of bed net, suggest that over time, the implementation of the PHSDP program significantly increased the likelihood of a child's health improvement by about 82% unlike if the program was not implemented. This outcome concurs with (Sharma, 2016), where a significant association between program implementation with child health through mother-to-child services. Thus, the program initiatives have in one way played a significant role in improving children's health even though data on other aspects of a child's health could help explain more. This also could help explain the increase in the likelihood of children's health as it combats the reduction of malaria-related deaths for children less than five years through bed net provision unlike if the program was not implemented.

4.3 The Impact of PHSDP on Maternal and Child Health Outcomes

Table 4 offers a snapshot of maternal and child health outcomes over ten years, focusing on three specific metrics: place of delivery, skilled birth attendance, and child health as indicated by bed net usage. The values represent changes over time of a health-related program, denoted by "Time*PHSDP. To determine the real impact of the Public Health Service Delivery Program (PHSDP) on the three outcomes (place of delivery, attendant at birth, and child health), given the regression results we calculate the impact as follows; -

$$Impact_t = coefficient\ of\ PHSDP + [coefficient\ of (Time * PHSDP) * t] \quad (4)$$

Table 4
The Impact of PHSDP Over Time

Maternal and child health outcomes	Years	Time*PHSDP
Place of delivery(1=Public/private facility, 0= Otherwise)	Initial year	-2.77
	After 5 years	-0.11
	After 10 years	2.56
Skilled birth (1=Attended by professional, 0=Otherwise)	Initial year	-2.09
	After 5 years	0.07
	After 10 years	2.23
Child health(1=Use bed net, 0=Otherwise)	Initial year	-1.67
	After 5 years	2.47
	After 10 years	6.60

Source: Author's Construction, using NPS 2008/2015

Results from Table 4 show that the initial effect of PHSDP is negative for all three outcomes (place of delivery, attendant at birth, and child health). This indicates that at the very initial stage of the implementation of the program, people hesitate to attend hospitals and other delivery facilities due to misinformation in the health market which might be a result of their cultural beliefs on the new health information. In the Trans-theoretical model of health behavior change at the initial stage of implementation of the program, people may be in the pre-contemplating or contemplating stage where they have no intention of changing their behavior or are even unaware of the program or are aware that a program exists and seriously contemplates changing the behaviour, but takes no action yet (Lalazaryan & Farashband, 2014). However, the positive interaction term suggests that the negative impact diminishes over time, and for child health and skilled birth, the effect turns positive within five years of implementation of the program, indicating substantial improvement. The results reveal that the real impact of the PHSDP on place of delivery, attendant at birth, and child health shows an initial negative effect, which becomes positive over time due to the significant interaction

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between time and PHSDP. This highlights the importance of sustained implementation and monitoring of the program to achieve long-term positive outcomes.

4.4 Discussion

These results make several important contributions to the existing literature on the evaluation of health programs, as the findings indeed show that the PHSDP has a statistically significant positive effect on maternal and child health outcomes over time. The results partly confirm and partly contradict previous studies, underlining the role of context, program design, and implementation commitment.

The initial negative impact of the PHSDP across all three outcome variables resonates with the behavioral theories highlighted in the conceptual framework, such as the Trans-theoretical model. This early-stage resistance can be attributed to deeply imbedded cultural practices and initial misinformation-a challenge similarly documented in other settings. For example, Belo et al. (2017) estimated "giving birth at home" and "limited knowledge at the community level" as some of the main drivers of poor health outcomes in Mozambique; thus, similar barriers that the PHSDP may have faced in Tanzania. That suggests that a period of low uptake following a new intervention may be a common phenomenon in contexts where traditional practices are strong, and it does underline the necessity of robust, sustained community engagement from the very outset.

Nonetheless, the successive positive and statistically significant long-term outcomes for facility-based deliveries present good evidence that these initial setbacks were overcome by PHSDP. This result is congruent with those obtained by Nababan et al. (2017) in Bangladesh, where the same program resulted in a phenomenal increase in the rate of facility deliveries. The finding also corroborates that by Gitobu et al. (2018), who reported that eliminating financial barriers through Kenya's free maternal care policy increased health facility deliveries significantly. Our results thus indicate that improving physical access-which is the necessary first step toward improving maternal health outcomes-was indeed achieved through the PHSDP strategy of constructing and rehabilitating health infrastructure.

On the contrary, our positive results are in sharp contrast to the findings from the evaluation done by Mohanan (2016) for the Chiranjeevi Yojana program in India, which reported no significant association with the probability of institutional delivery. The divergence underlines that having a program is not enough; its success is likely to depend on specific elements in the design, quality of built facilities, and effectiveness of parallel demand side interventions such as community awareness creation that might have been stronger in PHSDP.

In terms of skilled birth attendance, our 43% increase in likelihood reinforces the imperative of tackling human resource shortages, which is at the core of PHSDP goals. We find this result strongly supported by Nababan et al. (2017) and Singh (2013), who have both found significant improvements in skilled delivery following health interventions. This suggests that efforts in the program to rehabilitate training institutions and bridge the gap in staff did indeed pay off. This success story points towards a critical avenue for future research and policy: while there was an increase in numbers, the reminder by Kruk (2016) in Uganda and Zambia stresses that increased skilled attendance does not imply high-quality care. Their mixed results on patient satisfaction and perceived quality point to the fact that future efforts in Tanzania need to be placed not only on the number of health workers but also on the competencies, attitudes, and enabling environment in which they work.

For instance, the greatest effect is seen in child health proxied by bed net use, with an increase of 82% in the likelihood of improvement. This strong influence is again a finding in support of Sharma (2016), where community-based women's groups in Nepal significantly raised the prevalence of preventive behaviors such as iron and folic acid supplementation. This shows the effectiveness of the mother-to-child advocacy component of PHSDP in encouraging a specific, low-cost, high-impact preventive behavior. This success in driving the adoption of a key commodity suggests that well-designed information, education, and communication campaigns within broader health programs can yield remarkable returns in child survival, particularly against malaria.

Finally, the fact that it takes time for the benefits of this program to be gradually realized-as indicated by negative coefficients turning positive over 5 to 10 years-challenges expectations of immediate impacts. This temporal dimension is echoed in Tanner et al. (2015) in Lao PDR, where the overall impact of a nutrition project was mixed, although its benefits became clearly visible over time among the poorest 40%. It thus indicates that the real value of complex health system investments, such as PHSDP, may be underestimated in short-term evaluations. Patience and long-term funding are core requirements, given the intrinsically slow pace at which behavioral change and health system strengthening can occur.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

It was revealed that the implementation of the PHSDP program based on its 17 components of implementation in this case the health facilities availability, skilled birth attendants as well as the mother’s advocacy programs had a significant effect on the mother and child health respectively. The findings revealed that the mother's likelihood of

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giving birth in hospitals increased by 53%, with a 43% likelihood increase in skilled birth attendance and an 82% increase in the likelihood of child health improvement due to the mother's advocacy program unlike if the program was not at all implemented. The analysis demonstrates complex dynamics between the variables affecting maternal and child health outcomes. In terms of the real impact of the program, the results show that time alone has no significant impact, and PHSDP initially correlates with adverse maternal and child health outcomes (place of delivery, attendant at birth, and child health). However, over time, PHSDP's influence turns positive, suggesting that its benefits materialize gradually, underscoring the importance of sustained health interventions and possibly highlighting initial challenges in program implementation.

5.2 Recommendations

Based on the results obtained from the study, the following policy recommendations seem essential for the improvement of the health sector but in particular maternal and child health; Firstly, the Government as the main actor responsible for the improvement of the health sector should in a cooperated and most robust way improve budget allocation and disbursement of funds to the Ministry of Health for satisfactory improvement of health infrastructures in the country as well as scaling up the coverage of National Health Insurance schemes. This would enable more women to access the use of hospitals and clinics during pregnancy as well as giving birth.

Secondly, the study raises the necessity of engaging in active and most continued information dissemination in terms of health promotion programs on the necessities of the utilization of health care services provided by the health facilities. Services like a mother to child provided by the PHSDP program need more advocacy through media outlets, political arenas and Government outlets to Local authorities, this way more rural residing women can utilize such opportunities offered by these programs. Provision of knowledge on the importance of such services could be a key to the improvement of women and child's health as well as a potential tool in reducing maternal and child death most especially in rural areas.

Thirdly, the issue of skilled birth attendance is complex and more likely reliant on many factors including the existence of health facilities as well as trained health personnel but because there exists a significant shortage of health's staff across all main cadres with an inclusion of the technical staff in the social welfare services, could be confronted through the provision of internships of such cadres to areas of shortages as a temporary solution while responsible organs find a more prominent solution to the problem. This could be accomplished through improving and establishment of more training institutions pertaining to diseases that were less attended to as well as research institutes for pandemics.

Furthermore, programs like PHSDP should be designed in a dynamic mechanism to allow community involvement with outside partners in the implementation of such health programs. This avenue should provide the most sophisticated, efficient and more integrated coordination system; such organizations in the health sector have been implemented in other countries like Hungary whereby it is known as Hungarian Care Coordination Organization (CCO). Such organizations normally assume responsibility for virtually the entire spectrum of services (from primary to tertiary care) for a population signed up with primary care (family doctors) in a given geographical area and against an adjusted capitation payment.

REFERENCES

Amponsah, S., Osei, E., & Aikins, M. (2020). Process evaluation of maternal, child health and nutrition improvement project (MCHNP) in the Eastern Region of Ghana: A case study of selected districts. *BioMed Research International, 2020*, Article 1259323. https://doi.org/10.1155/2020/1259323

Babughirana, G., Gerards, S., Mokori, A., Muwema, M., Mutiiria, M., Kassaza, K., & Ekirapa-Kiracho, E. (2020). Maternal and newborn healthcare practices: Assessment of the uptake of lifesaving services in Hoima District, Uganda. *BMC Pregnancy and Childbirth, 20*(1), 686. https://doi.org/10.1186/s12884-020-03385-x

Belo, C., Pires, P., Josaphat, J., Siemens, R., Rooke, E., & Spence-Gress, C. (2017). Maternal and newborn mortality: Community opinions on why pregnant women and newborns are dying in Natikiri, Mozambique. *International Journal of Research, 4*(6), 112–119.

De La Torre, A., Nikoloski, Z., & Mossialos, E. (2018). Equity of access to maternal health interventions in Brazil and Colombia: A retrospective study. *International Journal for Equity in Health, 17*, Article 43, 34–38. https://doi.org/10.1186/s12939-018-0752-x

Frankenberg, B. S. (2009). Do women increase their use of reproductive health care when it becomes more available? Evidence from Indonesia. *Studies in Family Planning, 40*(1), 27–38.

Frew, E. (2013). The demand for health and healthcare - Grossman model. University of Birmingham.

Gitobu, C. M., Gichangi, P. B., & Mwanda, W. O. (2018). The effect of Kenya's free maternal health care policy on the utilization of health facility delivery services and maternal and neonatal mortality in public health facilities. *BMC Pregnancy and Childbirth, 18*, 77. https://doi.org/10.1186/s12884-018-1708-2

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Goyet, S., Broch-Alvarez, V., & Becker, C. (2019). Quality improvement in maternal and newborn healthcare: Lessons from programmes supported by the German development organisation in Africa and Asia. *BMJ Global Health, 4*, e001562. https://doi.org/10.1136/bmjgh-2019-001562

Grossman, M. (1972). *The demand for health: A theoretical and empirical investigation*. National Bureau of Economic Research.

Grossman, M. (1999). The human capital model of the demand for health (NBER Working Paper No. w7078). National Bureau of Economic Research. https://ssrn.com/abstract=206128

Kruk, M. E. (2016). Evaluation of a maternal health program in Uganda and Zambia finds mixed results on quality of care and satisfaction. *Health Affairs, 35*, 510–519.

Kureya, C. M. (2017). A maternal and child health programme evaluation. *International Journal of Health Sciences and Research, 7*(7), 226–235.

Lalazaryan, A., & Farashband, F. (2014). A review of models and theories of health information seeking behavior. *International Journal of Health System and Disaster Management, 2*(4), 193–203.

Ministry of Finance and Economic Affairs. (2010). *National strategy for growth and reduction of poverty (NSGRP) II ("005-2010)*. United Republic of Tanzania.

Mohanan, M. (2016). Improving maternal and child health in India: Evaluating demand and supply strategies. International Initiative for Impact Evaluation (3ie).

MoHCDGEC. (2017). *The National Health Policy*. Dar es Salaam: Ministry of Health, Community Development, Gender, Elderly and Children.

Nababan, H. Y., Islam, R., Mostari, S., Hasan, M., & Anwar, I. (2017). Improving quality of care for maternal and newborn health: A pre-post evaluation of the Safe Childbirth Checklist at a hospital in Bangladesh. *BMC Pregnancy and Childbirth, 17*(1), 402. https://doi.org/10.1186/s12884-017-1588-x

Onwujekwe, O. (2019). Assessment of a free maternal and child health program and the prospects for program re-activation and scale up using a new health fund in Nigeria. *Nigerian Journal of Clinical Practice, 22*(7), 1516–1529.

Panchachan, D. (2019). Panel unit root test. In *Econometrics in theory and practice*. Springer Singapore.

Shankar, N. B. (2017). Impact of m-health application used by community health. *Tropical Medicine and International Health, 22*(7), 895–907.

Sharma, S. (2016). Measuring what works: An impact evaluation of women's groups on maternal health uptake in rural Nepal. *PLOS ONE, 11*(5), e0155144. https://doi.org/10.1371/journal.pone.0155144

Singh, K. (2013). Impact evaluation of a quality improvement intervention on maternal and child health in Northern Ghana. *International Journal for Quality in Health Care, 5*(7), 477–487.

Tanner, J., Hayashi, R., & Li, Y. (2015). Improving coverage and utilization of maternal and child health services in Lao PDR (IEG Working Paper No. 2). World Bank Group.

TDHS. (2010). *Tanzania demographic health survey*. Dar es Salaam: National Bureau of Statistics.

TDHS. (2015/16). *Tanzania demographic and health survey and malaria indicator survey*. Dar es Salaam: National Bureau of Statistics.

United Nations Children's Fund, & World Health Organization. (2020). *Immunization coverage: Are we losing ground?* UNICEF. https://data.unicef.org/resources

Zhou, H. (2020). Conditional cash transfers, uptake of maternal and child health services, and health outcomes in western rural China. *BMC Public Health, 20,* Article 8996. https://doi.org/10.1186/s12889-020-08996-9

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Assessing impact of climate change on maize production in Tanzania: Inter-regional analysis

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ABSTRACT

Climate change is one of the major contributors to reduced agricultural production globally, and particularly in Africa, where the majority of households rely on rain-fed agriculture. Variability in rainfall, rising temperatures, and increasing atmospheric carbon dioxide levels put crops at risk. Guided by Nerlove's agricultural supply-response theory, the study conceptualized maize production as mainly influenced by climatic factors, with rainfall and temperature treated as external factors that shift the maize supply curve. A quantitative longitudinal design was adopted to assess the impact of climate change on maize production in Tanzania, with emphasis on Kongwa, Kilosa, and Mufindi. Secondary time series (1990–2020) data on annual rainfall, temperature, maize production, and cultivated area under maize were collected from the Tanzania Meteorological Authority, the National Bureau of Statistics, and the Food and Agriculture Organization for quantitative analysis using the Autoregressive Distributed Lag Error Correction Model (ARDL-ECM). The model results show that maize production is strongly affected by rainfall in the short run, with significant effects in Kongwa (0.0029; $p < 0.001$), Kilosa (0.0010; $p = 0.012$), and Mufindi (0.0010; $p < 0.001$). Although the short-run rainfall effects suggest an immediate, but not lasting, impact on maize production, the long-run rainfall effects were insignificant across districts. In Mufindi, temperature had a significant impact on maize production in the short and long run (–0.0311; $p < 0.001$), indicating that warming reduces production in cooler highlands. The error-correction terms (ECT) were significant across districts: Kongwa (–0.9946; $p < 0.001$), Kilosa (–0.9855; $p = 0.003$), and Mufindi (–0.3563; $p = 0.027$), implying that production adjusts to climatic shocks over time. An increasingly cultivated area under maize enhances resilience, but it is still climate-constrained. Rainfall variability affects Kongwa and Kilosa, which are resilient owing to a milder climate, and Mufindi, which is vulnerable to temperature stress. The study suggests agricultural crop insurance, climate-resilient infrastructure and technology, improved irrigation in Kongwa, better water management in Kilosa, and heat-tolerant varieties in Mufindi as key interventions to meet these challenges and support food security across Tanzania's agroecologies.

Keywords: ARDL-ECM, Climate Change, Inter-Regional Analysis, Maize Production, Tanzania

I. INTRODUCTION

Climate change is a global environmental threat that significantly affects agricultural productivity in several ways, including its direct impact on food production (Yuan *et al*., 2024). Its consequences are worse in areas where farmers depend on rain-fed systems for their livelihoods (Luhunga, 2017). Climate change is primarily caused by the release of greenhouse gases into the atmosphere, which leads to global warming (Gahlawat & Lakra, 2020). In Sub-Saharan Africa, climate change is evident in rising temperatures, unpredictable rainfall, floods, and droughts that disrupt crop cycles, reduce soil moisture, and lower yields (Abbass *et al*., 2022). Tanzania, where the economy and food security heavily rely on agriculture, is among the nations most vulnerable to climate change (Abebaw, 2025). The agricultural sector contributes 27% of the national gross domestic product (GDP) and employs more than 65% of the population, which makes it highly vulnerable to climate change (Rweyemamu *et al*., 2024).

Maize (Zea mays L.) is Tanzania's main staple and food-security crop, cultivated by more than 80% of smallholder farmers and occupying 45% of the total cultivated area (approximately 5.6 million hectares (Utonga & Kamwela, 2024). However, maize production strongly depends on seasonal rainfall and optimal temperature conditions, which make the crop particularly sensitive to climate variability (Abbass *et al*., 2022). Several studies have reported that erratic rainfall and rising temperatures have repeatedly disrupted maize yields, causing food deficits and income instability among rural households (Lukali *et al*., 2021; Mkonda *et al*., 2018). Luhunga (2017) further reported that rising temperatures shorten the growing season and delay seed germination, thereby affecting maize yield and production and contributing to yearly variations.

These variations in maize production are due to external climatic factors, such as rainfall and temperature fluctuations (Kisetu *et al*., 2025). High variability in maize production poses a risk to households' food access, increases

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imports, and destabilizes the economy (Bangelesa, 2021). Despite these challenges, few studies in Tanzania have analyzed the effects of climate change on maize production at the region-specific level. The existing studies, such as Joseph *et al*. (2025) are based on national-level aggregates, overlooking variations in agroecology, which further obstructs region-specific interventions.

While previous studies (Lukali *et al*., 2021; Mkonda & He, 2018) have assessed yield responses to climatic variables, this study uses maize production, following (Magwaza & Lyaro, 2024; Moshi *et al*., 2023; Rasheed & Sadozai, 2024). The effects of climate change on maize production differ significantly across Tanzania's agro-ecological zones. They are characterized by significant changes in rainfall and temperature from the semi-arid central regions to the humid highlands, resulting in location-specific production responses (Mkonda & He, 2017). The existence of this variability at the regional level is essential for understanding localized production responses. Therefore, this study assesses the impact of climate change on maize production between 1990 and 2020 by focusing on representative districts that span climatic diversity: Kongwa (semi-arid central zone, Dodoma region); Kilosa (humid Morogoro region); and Mufindi (wet cool highlands, Iringa region).

The study aligns with the Sustainable Development Goals (SDGs), particularly SDG 2 (Zero Hunger) and SDG 13 (Climate Action), which focus on resilient agriculture and adaptation to climate change. The ARDL-ECM was employed in this study to estimate the short and long-run impacts of climate on maize production. The results contribute to the literature by quantifying the effects of climate change at a local scale.

1.1 Research Objective

Assessing the impact of climate change on maize production in Tanzania from 1990-2020: inter-regional analysis.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is guided by the agricultural supply-response theory developed by Nerlove and Addison (1958). The theory extends the classical supply-and-demand theory by examining how agricultural producers adjust their output in response to shifts in external factors such as prices and climatic conditions. Similar studies in agricultural sciences, such as Mbua & Atta-aidoo (2023), Noorunnahar *et al*. (2023), and Schultze *et al*. (2024) have applied the framework. Droughts, heat stress, and unpredictable rainfall shift the supply curve for maize to the left, lowering production and potentially leading to price instability, while favorable climatic conditions shift the supply curve to the right, increasing production (Abbass *et al*., 2022). This study conceptualized climatic variables as key factors influencing maize supply. Well-distributed and reliable rainfall improves soil moisture and crop growth, increasing maize output, while rising temperatures increase evapotranspiration, cause heat stress, and reduce output. Therefore, rainfall is expected to have a positive effect, whereas rising temperature is expected to reduce maize output.

2.2 Empirical Review

Previous researchers (Akpa, 2024; Zhang *et al*., 2022; Talib *et al*., 2021) have observed that climate change is the primary determinant affecting agricultural production and yield, particularly in Sub-Saharan Africa, due to significant alterations in rainfall patterns, rising temperatures, and the occurrence of extreme weather events. In Sub-Saharan Africa, where more than 90% of cropland is rain-fed, year-to-year variability accounts for 20-40% of production variability in primary staples such as maize, sorghum, and cassava (Elias, 2025). Predicted temperature rises of 1.5 to 2 ^{0}C above pre-industrial averages are expected to decrease average cereal yields by 10-20% if no adaptive strategies are adopted (Nigatu *et al*., 2022). All the above-mentioned discoveries highlight the increasing risks faced by smallholder farmers, who depend heavily on rainfall for crop production.

According to Luhunga (2022), in Tanzania, data from 1981 to 2020 revealed a national temperature increase of about 1.0 °C and a shift toward shorter, more intense rainy seasons, with long dry spells and localized flooding becoming more frequent. Rainfall variability accounted for 45% of annual fluctuations in maize production, while rising minimum temperatures shortened the crop's growing period (Mkonda & He, 2017). The adverse effects are particularly intense in semi-arid and mid-altitude zones, where evapotranspiration often exceeds rainfall during the growth stages (Matata *et al*., 2019). Recently, droughts have reduced household maize output by 25-30% in severely affected districts (Namkunda *et al*., 2020). According to Gebre (2021), all these climatic stresses threaten not only production and yield volumes but also food affordability and nutrition.

Despite the Maize crop being crucial to Tanzania's food system, it is cultivated on approximately 5.6 million ha, about 45% of all cropland, and consumed by more than 80% of households (Utonga & Kamwela, 2024). However, average national yields remain low at 2.0-2.3 t ha^{-1}, compared with the potential yield of 5–6 t ha^{-1} under optimal conditions (Majebele *et al*., 2025; Mourice *et al*., 2015). This wide yield gap reflects challenges, including the erratic rainfall, soil degradation, and temperature stress (Rowhani *et al*., 2011). The Intergovernmental Panel on Climate

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Change [IPCC] in 2023 projected that, without adaptation, maize yields in East Africa could decline by 12–20% by 2050 under moderate emission scenarios and non-climatic factors. Climate change interacts with non-climatic factors, creating vulnerability to food security by enhancing production variability (Marzouk *et al*., 2023). Most empirical studies (Kambi *et al*., 2025; Mkonda, 2022) have identified climate change and variability as the main challenges to the agricultural sector at the national level in Tanzania. The aggregation at the national level hinders the recognition of the varied agro-ecological conditions in semi-arid, sub-humid, and highland zones, where climatic variations and adaptive capacities differ. This study examines the effects of rainfall and temperature on maize production in Kongwa, Kilosa, and Mufindi districts, using the ARDL-ECM model to quantify the long- and short-run effects of climatic variables on maize production in the three districts.

III. METHODOLOGY

3.1 Study Area

The study was conducted in three maize-producing districts of Tanzania: Kongwa, Kilosa, and Mufindi. These districts were purposively selected to present the semi-arid, sub-humid, and wet highlands, respectively. Kongwa district is located in the Dodoma Region at an elevation of roughly 1000 meters above sea level (6°00′–6°35′ S, 36°15′–36°45′ E). It experiences temperatures of 26°C to 30°C and receives unpredictable rainfall of 400–600 mm annually. Kilosa District, located in Morogoro Region (6°30′–7°15′ S, 36°30′–37°30′ E), lies within a sub-humid zone that can support both rain-fed and irrigated maize production. The area receives 1,000–1,400 mm of rainfall and experiences temperatures between 24°C and 28°C. Mufindi District, situated in Iringa Region (8°00′–8°50′ S, 35°15′–36°15′ E), lies at an elevation of 1,700–2,200 meters above sea level. Experiences cooler temperatures that range from 15°C to 20°C and receives 1,200–2,000 mm of rainfall annually.

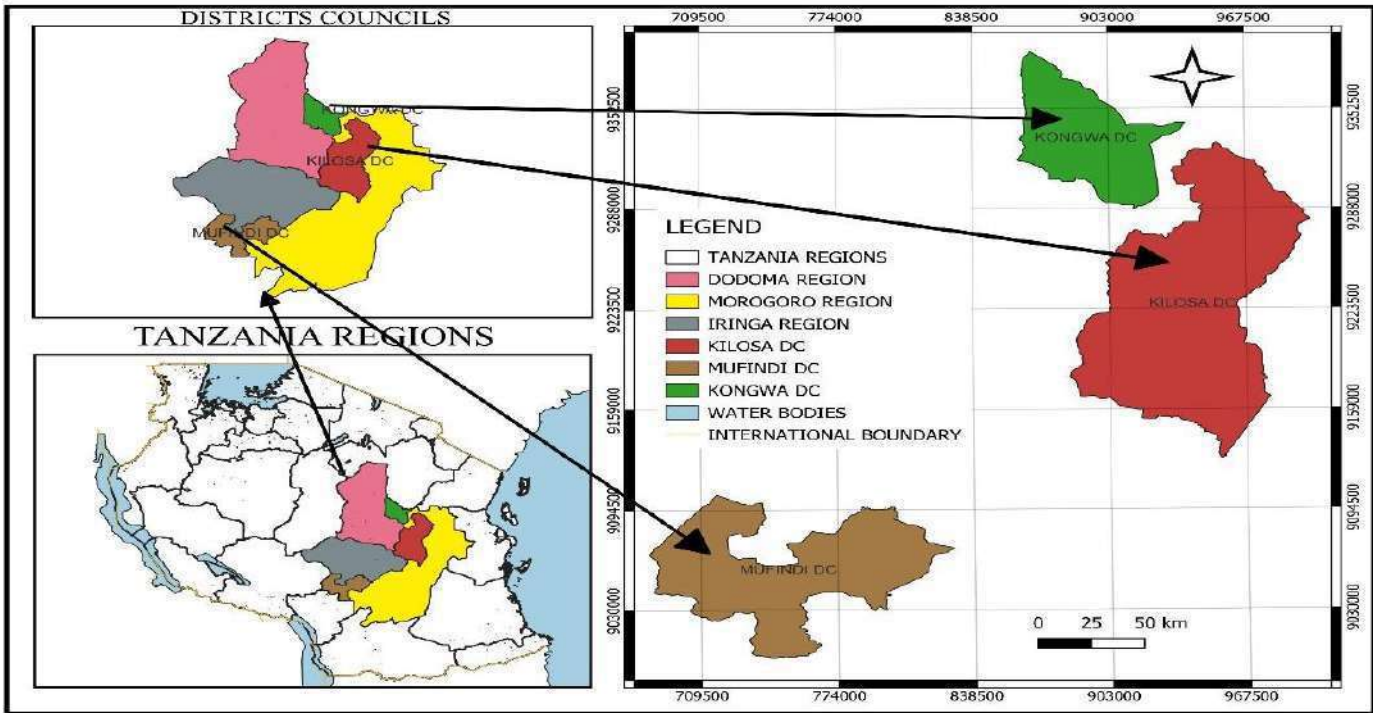

Figure 1
Map of the Study Area

3.2 Research Data and Design

Research data obtained from the Tanzania Meteorological Authority (TMA), the National Bureau of Statistics (NBS), and the Food and Agriculture Organization (FAO). The dataset includes temperature (°C), rainfall (in millimeters), cultivated area under maize (in hectares), and maize production (MT). To guarantee consistency, the data was also cross-checked. To determine how changes in climatic factors impact maize production in Kongwa, Kilosa, and Mufindi, the study used a longitudinal econometric research approach, which facilitates the the detection of temporal dynamics and causal inferences by monitoring the same participants over multiple time periods (Gangl, 2022). Purposive sampling was used to select the study region.

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3.3 Model Specification

The ARDL-ECM model was developed by Pesaran *et al*. (2001) to analyze the dynamic relationships between time series variables, specifically to estimate both short-run and long-run effects. The model used to analyze the impact of climate change on maize production in the study area was also applied to address cointegration issues. The augmented Dickey-Fuller test was used to determine whether a unit root was present, and non-stationary variables were differenced to make them stationary. The ARDL model is considered to be the appropriate econometric tool when the variables are either stationary at I (0) or I (1).

The long-run is derived by estimating the long-run coefficients from the ARDL model.

$$Y_t = \alpha + \sum_{i=1}^{p} \phi_i Y_{t-i} + \sum_{j=1}^{q} \beta_j R_{t-j} + \sum_{k=1}^{r} \gamma_k T_{t-k} + \sum_{l=1}^{s} \sigma_l A_{t-l} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: Y_t Maize production at time *t* , R_{t-j}Rainfall at the time *t-j* (lag *j*), T_{t-k}: Temperature at the time *t-k* (lag *k*), A_{t-l}: cultivated area under maize at the time $t-l$ α: Constant term, ϕ_iCoefficients for the lagged dependent variable Y_{t-i} (lags up to *p*), β_jCoefficients for the lagged rainfall R_{t-j} (lags up to *q*) , γ_k Coefficients for the lagged temperature T_{t-k} (lags up to *r*), σ_l Coefficients for the lagged cultivated area under maize (lags up to *s*), ε_tError term at time *t*.

The short-run dynamics have been assessed by deriving the error correction model (ECM) from the ARDL model, which incorporates the lagged error term.

Model specification:

$$\Delta \ln Y_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta ln(Y_{t-i}) + \sum_{j=1}^{q} \beta_2 \Delta \ln(R_{t-j}) + \sum_{k=1}^{r} \beta_3 \Delta \ln(T_{t-s}) + \sum_{l=1}^{s} \beta_4 \Delta ln(A_{t-r}) + \lambda ECT_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\

The temperature averaged 28.22°C and had a relatively low standard deviation of 0.89°C, indicating stable but high temperatures ranging from 26.70°C to 29.70°C. Such consistently high temperatures are aligned with findings from studies in semi-arid regions, where elevated temperatures exacerbate water stress (Mkonda & He, 2017).

Maize production averaged 111,583.87 MT, with a standard deviation of 20,790.80 MT, and showed moderate variation, perhaps driven by rainfall variability, as the minimum (76,800 MT) and maximum (161,800 MT) production levels showed significant year-to-year changes. This fluctuation highlighted the vulnerability of maize production to climatic variation in the semi-arid zone.

Cultivated area presented a mean of 52,391.94 ha and a standard deviation of 7,045.05 ha, fluctuating between 41,200 ha and 64,200 ha, reflecting the gradual expansion of agricultural land use, perhaps in response to population growth, which generates rising market demands, and the fact that the variability of the cultivated areas was relatively low compared with production.

Table 2

Descriptive Statistics Table for Kilosa (1990–2020)

Statistic	Rainfall (mm)	Temperature (°C)	Maize Prod (MT)	Cultivated Area (ha)
Mean	1180.32	25.55	248358.06	93045.16
Std	201.46	0.20	54296.13	17750.84
Min	792.00	25.10	144800.00	67900.00
25%	1030.00	25.40	205950.00	78450.00
50%	1189.00	25.60	254900.00	90100.00
75%	1334.50	25.75	292250.00	107350.00
Max	1502.00	26.00	342900.00	125600.00

Table 2 presents descriptive statistics for the variables reported in Kilosa, providing insights into their central tendencies and dispersion over the 30 years. The mean rainfall in Kilosa was 1,180.32 mm, with a standard deviation of 201.46 mm, indicating significant variation from 792.00 mm to 1,502.00 mm. The typical rainfall frequency of a sub-humid climate favored maize production, although variations indicated the risk of floods or drought in extreme years, as reported in sub-humid zones (Rowhani *et al*., 2011).

The temperature averaged 25.55°C, with a very low standard deviation of 0.20°C, indicating greater stability than in Kongwa. The values ranged from 25.10°C to 26.00°C. The data show low interannual temperature variation, meaning there were no significant temperature swings from year to year, though several studies, such as Luhunga (2022), projected an increase in mean annual temperature of about 1°C; this warming has not created year-to-year variation but still affects crop growth over time in Kilosa.

At 54,296.13 MT, the standard deviation was significant, suggesting that maize production was very erratic. The average production was 248,358.06 MT, with a range of 144,800 MT to 342,900 MT. These fluctuations demonstrated how sensitive maize production was to rainfall, suggesting that this region was heavily reliant on ideal weather conditions. These findings align with those of Matata *et al*. (2019), who highlighted that maize production in sub-humid districts is more tolerant of climate fluctuations than in semi-arid regions.

The cultivated area has increased substantially, ranging from 67,900 ha to 125,600 ha. According to Authority (2019), this growth is likely related to increased agricultural investment, which may have been spurred by market demand or population growth amid climate change. The descriptive statistics for Kilosa indicated a district characterized by high, variable rainfall and moderately stable temperature conditions, creating a favorable environment for maize production. However, the noticeable rainfall fluctuations suggest that, despite Kilosa's strong agricultural potential, maize farming remains vulnerable to short-term climatic shocks and irregular rainfall patterns.

Table 3

Descriptive Statistics Table for Mufindi (1990–2020)

Statistic	Rainfall (mm)	Temperature (°C)	Maize Prod (MT)	Cultivated Area (ha)
Mean	1376.58	19.52	134332.26	57341.94
Std	245.67	0.34	39876.12	14567.89
Min	980.00	18.20	112300.00	59000.00
25%	1234.00	18.50	157800.00	66500.00
50%	1420.00	18.70	189000.00	78000.00
75%	1610.00	18.90	222300.00	89500.00
Max	1865.00	19.40	267800.00	101200.00

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In Mufindi, the rainfall distribution had a mean of 1,376.58 mm and a standard deviation of 245.67 mm, as summarized in Table 3. This shows that the data, which ranged from 980.00 mm to 1865.00 mm, varied moderately. Maize production was made possible by the moist highlands' normal, intense rainfall. However, there was also variation, suggesting that it occasionally ran the risk of becoming overly wet, which is consistent with research on Tanzania's highland maize system (Mongi *et al*., 2010).

The temperature ranged from 19.40°C to 19.52°C, with a mean of 19.52°C and a low standard deviation of 0.34, indicating strong stability. This climate and moderate temperature regime were quite different from those of Kongwa, which are warmer. This difference likely led to higher maize yields, as cooler temperatures reduce heat stress during critical germination or growth phases.

Maize production averaged 134,332.26 MT with a standard deviation of 39,876.12 MT, indicating moderate fluctuation, and ranged between 112,300.00 MT and 267,800.00 MT. These variations highlighted that rainfall was the key factor in productivity, and, by extension, the sustainability of production in Mufindi depended on its regularity. The standard deviation of the cultivated area was 14,567.89 ha, a considerable value indicating high land expansion, with a range of 59,0000.00 ha to 101,200.00 ha.

4.2 Impact of Climate Change on Maize Production in Tanzania

The ARDL-ECM was employed to investigate the impact of climate change on maize production in Kongwa, Kilosa, and Mufindi from 1990 to 2020. This model examined the immediate and time-lagged effects of climate factors, specifically rainfall and temperature, on maize production across various ecological regions of the country. The model's output is presented in Table 4, which lists the coefficients and p-values, along with their 95% confidence intervals for the various variables in the study.

Table 4

ARDL-ECM Model Results for Maize Production (1990–2020)

Region	Variable	Coefficient	p-value	Type
Kongwa	Constant	-0.1740	0.2220	Long-Run
	ECT (Maize Prod_log_diff.L1)	-0.9946**	0.0000	ECM
	Rainfall (mm).L1	0.0004	0.1960	Long-Run
	Temperature (°C).L1	-0.0102	0.8756	Long-Run
	Area (ha).L1	0.0000	0.0931	Long-Run
	D.Rainfall (mm).L0	0.0029**	0.0000	Short-Run
	D.Temperature (°C).L0	0.0284	0.4461	Short-Run
	D.Area (ha).L0	0.0000	0.1523	Short-Run
Kilosa	Constant	-0.0015	0.9030	Long-Run
	ECT (Maize Prod_log_diff2.L1)	-0.9855**	0.0030	ECM
	Rainfall (mm)_diff.L1	0.0001	0.7330	Long-Run
	Temperature (°C)_diff.L1	0.0057	0.9710	Long-Run
	Area (ha)_diff.L1	0.0000	0.2022	Long-Run
	D.Rainfall (mm)_diff.L0	0.0010**	0.0120	Short-Run
	D.Temperature (°C)_diff.L0	0.0058	0.9590	Short-Run
	D.Area (ha)_diff.L0	0.0000	0.7337	Short-Run
Mufindi	Constant	0.0083	0.3530	Long-Run
	ECT (Maize Prod_log_diff.L1)	-0.3563**	0.0270	ECM
	Rainfall (mm)_diff2.L1	0.0011	0.7624	Long-Run
	Temperature (°C)_diff2.L1	-0.0311**	0.0000	Long-Run
	Area (ha)_diff2.L1	0.0000**	0.0279	Long-Run
	D.Rainfall (mm)_diff2.L0	0.0010**	0.0000	Short-Run
	D.Temperature (°C)_diff2.L0	-0.0311**	0.0000	Short-Run
	D.Area (ha)_diff2.L0	0.0000	0.8562	Short-Run

*Note: **p<0.05. Maize Prod (MT)_log_diff.L1 and _diff2.L1 are error correction terms indicating long-run adjustment.*

According to the ARDL-ECM model, rainfall also had significant short-term impacts on maize output across certain districts. An example is in Kongwa (a semi-arid region), where a positive and significant short-run effect on maize output was observed, with a coefficient of 0.0029 and a p-value of 0.000. This means that if rainfall increases, maize production increases immediately, and vice versa. The wet highlands of Mufindi also exhibited a significant short-run positive elasticity of maize production with respect to rainfall, with an elasticity of 0.0010 and a p-value of 0.000. These results agree with the work of Omokpariola *et al*. (2025), which confirmed precipitation as a dominant factor in

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determining crop yield, especially in water-deficient areas. Ultimately, the outcomes varied by region. In Kongwa, the long-run impact of rainfall on maize production was not statistically significant, indicating that any short-term effects on yield do not persist. This could suggest the absence of absorptive capacities or a lack of infrastructure to benefit from increased rainfall on a long-term basis.

There was a variation between the semi-arid Kongwa and the sub-humid Kilosa in the climate-production relationship. Kilosa also showed substantial short-run impacts of rainfall on maize production (coefficient = 0.0010, p = 0.0000), indicating an almost immediate response to rainfall changes. In contrast to Kongwa, however, the long-term effects on rainfall in Kilosa were not statistically significant (p = 0.733), indicating that although the region experiences short-term rainfall enhancement, this effect does not persist in the long run. In Mufindi, rainfall patterns did not show significant long-run effects. Instead, temperature emerged as the key long-run factor affecting maize production. The negative coefficient (–0.0311; p < 0.001) indicates that warming reduces maize output in the cooler highland areas.

The temperature effects in Kilosa were not pronounced in the short run (p = 0.959) and long run (p = 0.971), indicating that the sub-humid climate of Kilosa is temperature-friendly for maize production. The negative coefficient of error correction (-0.9855, p=0.0030) indicates a strong error-correction mechanism at work in the Kilosa agricultural system, enabling it to revert production levels to a stable equilibrium after being disturbed by climate phenomena.

The contrasting results between regions highlight the importance of agro-ecological zone-specific interventions. While Kongwa requires immediate rainfall-use strategies and Mufindi needs temperature-stress mitigation, Kilosa's moderate climate and robust error-correction mechanisms suggest that this sub-humid region could serve as a model for climate-resilient agricultural practices. These practices could be adapted to similar agro-ecological zones across Tanzania. The error-correction terms, which captured the system's return to equilibrium after perturbations, were highly significant across all regions, indicating that maize production is self-correcting in response to climate change.

4.3 ARDL–ECM Model Fit for Maize Production across Districts

The line graph in Figure 2 illustrates the actual log maize production in Kongwa District from 1990 to 2020, as estimated by the Autoregressive Distributed Lag Error Correction Model (ARDL-ECM). The actual and fitted values of the log of maize output are shown by the solid (blue) and dotted (red) lines, respectively.

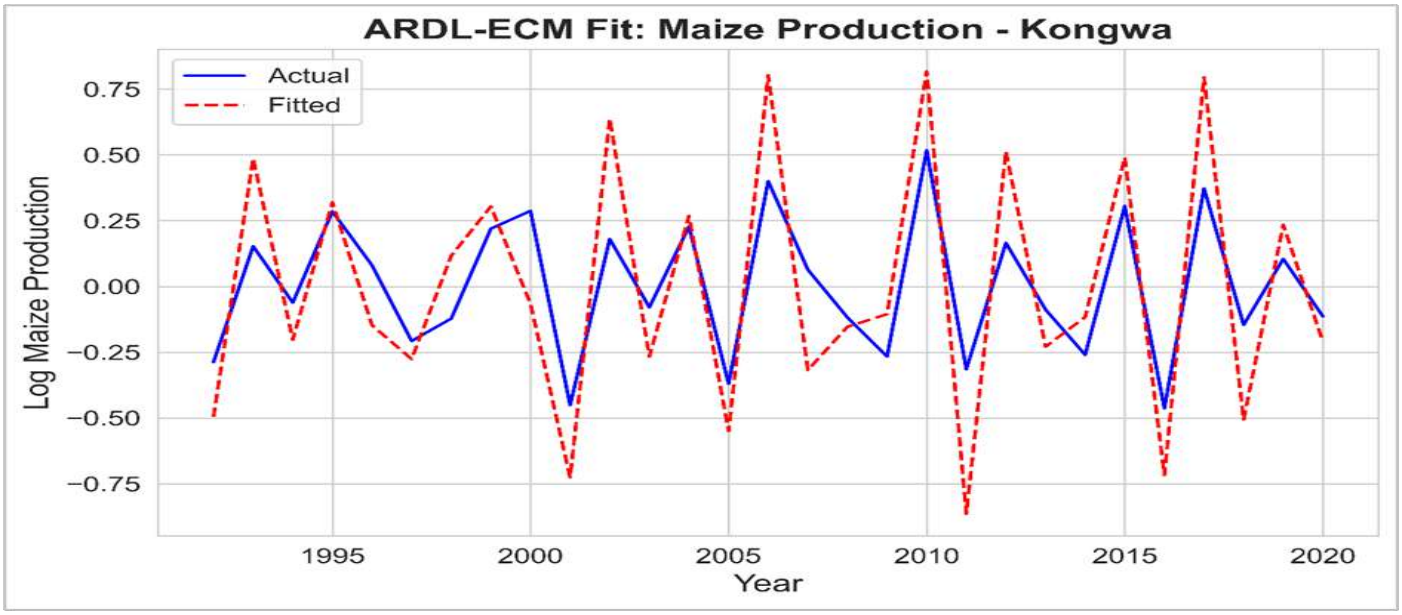

Figure 2
ARDL-ECM fit for Kongwa (1990-2020)

With the fitted line matching the observed peaks and slopes, the plot shows that the ARDL-ECM model aligns with the trend in maize production. This good fit suggests that the model accurately captures the complex relationship between maize production in the semi-arid Kongwa district and climate conditions. The close overlap between the fitted and actual lines indicates that the model accurately captures the short-term variations in maize production driven by rainfall. This confirms the findings, which indicated that only short-term rainfall (0.0029; P < 0.001) was significant, suggesting that Kongwa's maize production is highly responsive to rainfall variation. A quick adjustment to the long-run equilibrium is also shown by the substantial error-correction coefficient (-0.995). These findings align with those of Lipper *et al*. (2014), who reported that maize production in semi-arid areas in East Africa depends on seasonal rainfall variability rather than temperature changes.

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Figure 3 is the graphical depiction of the fit of the ARDL-ECM model for maize production in the sub-humid Area of Kilosa in the period 1990-2020. Such a comparison is crucial for assessing how well the model simulates the dynamics of maize production influenced by climate variables.

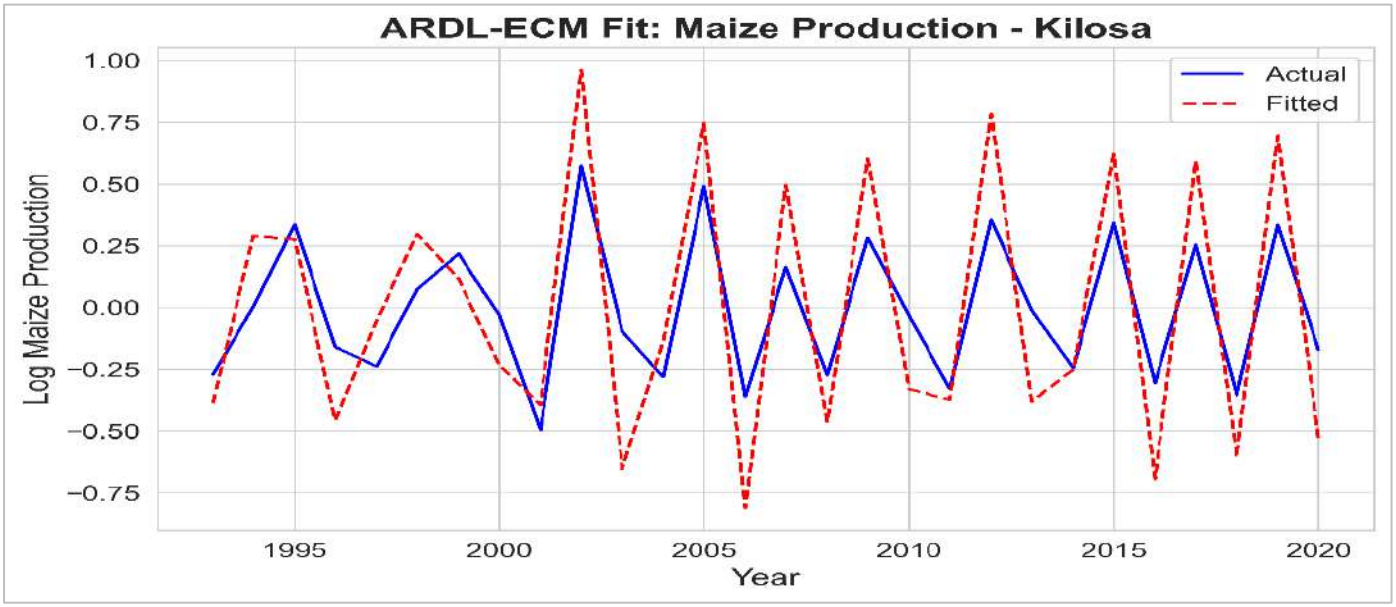

Figure 3
ARDL-ECM fit for Kilosa (1990-2020)

The line graph confirms the strong association between the observed and predicted values, with the model effectively capturing the observed variability in maize production under sub-humid conditions. This concordance suggests that the ARDL-ECM model is well-suited for capturing the impact of climate change on maize production in Kilosa. The short-run rainfall effect (0.0010; p = 0.012) observed in the ARDL-ECM is reflected visually by the model's ability to follow year-to-year production peaks and troughs. This pattern indicates that rainfall remains the dominant short-term driver.

Figure 4 illustrates the fitted value of the ARDL-ECM for log maize production in the wet highlands of Mufindi from 1990 to 2020, as shown in the time series graph. The solid blue line represents the reported log-transformed maize production values, while the red dashed line shows the model's fitted values. This visual comparison is crucial in evaluating how effectively the ARDL-ECM model captures the dynamics of maize production influenced by climatic factors.

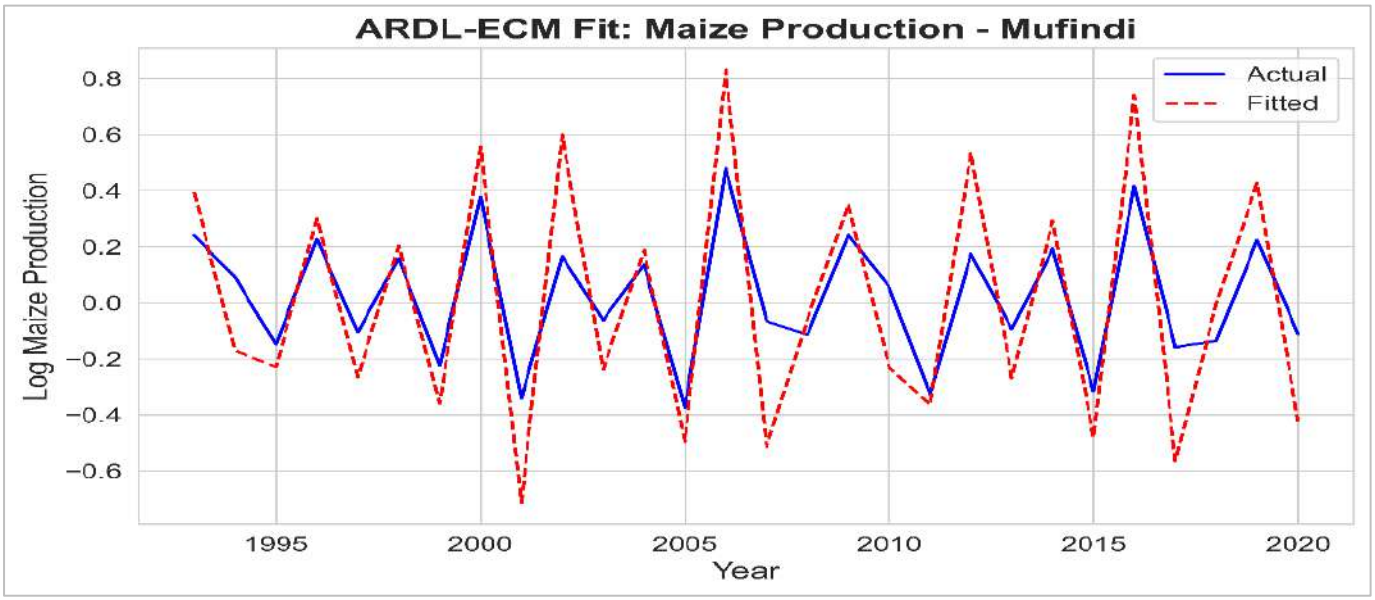

Figure 4
ARDL-ECM fit for Mufindi (1990-2020)

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Both the observed and fitted maize-production lines exhibit a gradual downward movement, confirming the significant negative influence of temperature detected in the ARDL-ECM results (−0.0311; $p < 0.001$). This indicates that warming trends have consistently reduced maize yields in the cooler highlands. Although rainfall still contributes positively in the short run, its effect is comparatively small. The slower speed of adjustment (ECT = −0.356) further suggests that production in Mufindi takes longer to recover from climatic disturbances. These results mirror those of Adhikari *et al.* (2015) and Rowhani *et al.* (2011), who reported that a rise in temperature in the East African highlands significantly depresses maize yields by shortening the growing period and intensifying heat stress.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

According to the study's findings, maize production in Kongwa, Kilosa, and Mufindi has been significantly affected by climate change. Rainfall is a key short-term driver, with a coefficient of 0.0029 ($p < 0.001$) in Kongwa, indicating immediate production responses, although long-run adaptation is limited (coefficient = 0.0004, $p = 0.196$). Kilosa's sub-humid conditions exhibit similar short-run rainfall sensitivity (0.0010, $p = 0.0120$), but with stronger error-correction mechanisms (-0.9855, $p = 0.0030$) compared to Kongwa, suggesting a better adaptive capacity in moderate climate zones. Mufindi's production decline ($p = 0.0001$) suggests that temperature stress is a factor. Comparing districts, Mufindi emerges as the most vulnerable due to long-term temperature effects (-0.0311, $p = 0.001$), while in Kongwa, rainfall has a short-run impact on maize production, with an insignificant long-run impact, stable rainfall ($p = 0.1960$), and a robust ECT adjustment. Therefore, future research should integrate non-climatic factors, such as socio-economic and technological variables, to gain a deeper understanding of how multiple factors interact to influence maize production under changing climatic conditions at the local level across different climatic zones, thereby informing more effective localized adaptation planning.

5.2 Recommendations

The study recommends implementing district-specific climate adaptation strategies based on its findings. Increasing climate-resilient infrastructure in Kongwa, especially irrigation and water harvesting systems, will help stabilize maize production despite erratic rainfall. In Kilosa, improving water management and promoting climate-smart practices like mulching and conservation tillage are essential. Farmers can be protected from climate change-related losses by introducing crop insurance schemes.

In Mufindi, where temperature stress reduces yields, it is necessary to use extension services to promote the adoption of heat- and drought-tolerant maize cultivars. Investing in drying and storage facilities and training farmers about climate-resilient farming methods can minimize losses. Implementing adaptation and mitigation strategies for climate change, including afforestation, soil conservation, and early warning systems, will boost resilience in each district. Collaboration between research institutions and local governments should be strengthened to develop site-specific adaptation models. Lastly, encouraging public and private investment in climate-smart agriculture can boost maize production and protect livelihoods from future climate shocks.

REFERENCES

Abbass, K., Qasim, M. Z., Song, H., Murshed, M., Mahmood, H., & Younis, I. (2022). A review of the global climate change impacts, adaptation, and sustainable mitigation measures. *Environmental Science and Pollution Research, 29*(28), 42539–42559. https://doi.org/10.1007/s11356-022-19718-6

Abebaw, S. E. (2025). A global review of the impacts of climate change and variability on agricultural productivity and farmers' adaptation strategies. *Food Science and Nutrition, 13*(5), 1–15. https://doi.org/10.1002/fsn3.70260

Adhikari, U., Nejadhashemi, A. P., & Woznicki, S. A. (2015). Climate change and eastern Africa: A review of impact on major crops. *Food and Energy Security, 4*(2), 110–132. https://doi.org/10.1002/fes3.61

Akpa, A. F. (2024). The effects of climate extreme events on selected food crop yields in Sub-Saharan Africa. *Heliyon, 10*(9), 1–10. https://doi.org/10.1016/j.heliyon.2024.e30796

Authority, T. M. (2019). Statement on the status of Tanzania climate in 2019. Tanzania Meteorological Authority.

Bangelesa, F. F. (2021). Impacts of climate variability and change on maize (Zea mays) production in tropical Africa [PhD thesis, Universitat Wurzburg].

Elias, G. (2025). The impacts of climate variability adaptation strategies on households' food availability: In Sodo Zuria Woreda, Wolaita Zone, Southern, Ethiopia [Master's thesis, Wolaita Sodo University].

Gahlawat, I. N., & Lakra, P. (2020). Global climate change and its effects. *Integrated Journal of Social Sciences, 7*(1), 14–23.

Licensed Under Creative Commons Attribution (CC BY-NC)

Gangl, M. (2022). Longitudinal designs and models for causal inference. In *Handbook of sociological science* (pp. 287–308). Edward Elgar Publishing.

Gebre, G. G. (2021). The impact of adopting stress-tolerant maize on maize yield, maize income, and food security in Tanzania. *Food and Energy Security, 10*, 1–20. https://doi.org/10.1002/fes3.313

Joseph, A., Mwakisisile, A. J., Sinkwembe, E. E., & Mbare, N. S. (2025). Modeling weather variability effects on maize production in Tanzania using ARIMAX. *Scientific African, 18*, e03030. https://doi.org/10.1016/j.sciaf.2025.e03030

Kambi, S. H., Mbilinyi, B. P., & Silungwe, F. R. (2025). Assessment of precipitation and temperature trends in Kilosa District, Morogoro, Tanzania. *Asian Journal of Environment & Ecology, 24*(5), 1–17. https://doi.org/10.9734/ajee/2025/v24i5691

Kisetu, E., Aneth, N., & Magubika, J. (2025). Spatiotemporal trends in maize production and seasonal variability in Tanzania. *Discover Agriculture, 3*(1), 160. https://doi.org/10.1007/s44279-025-00260-1

Liew, V. K. S. (2004). Which lag length selection criteria should we employ? *Economics Bulletin, 3*(33), 1–9.

Lipper, L., Thornton, P., Campbell, B. M., Baedeker, T., Braimoh, A., Bwalya, M., Caron, P., Cattaneo, A., Garrity, D., Henry, K., Hottle, R., Jackson, L., Jarvis, A., Kossam, F., Mann, W., McCarthy, N., Meybeck, A., Neufeldt, H., Remington, T., ... Torquebiau, E. F. (2014). Climate-smart agriculture for food security. *Nature Climate Change, 4*(12), 1068–1072. https://doi.org/10.1038/nclimate2437

Luhunga, P. M. (2017). Assessment of the impacts of climate change on maize production in the southern and western highlands sub-agroecological zones of Tanzania. *Frontiers in Environmental Science, 5*, 51. https://doi.org/10.3389/fenvs.2017.00051

Luhunga, P. M. (2022). Projection of extreme climatic events related to frequency over different regions of Tanzania. *Journal of Water and Climate Change, 13*(3), 1297–1312. https://doi.org/10.2166/wcc.2022.357

Lukali, A. A., Osima, S. E., Lou, Y., & Kai, K. H. (2021). Assessing the impacts of climate change and variability on maize (Zea mays) yield over Tanzania. *Atmospheric and Climate Sciences, 11*(3), 569–588. https://doi.org/10.4236/acs.2021.113035

Magwaza, C., & Lyaro, S. (2024). Impact of rainfall and temperature as aspects of climate change on maize production in Zimbabwe. *Journal of Water Resources, Engineering, Management & Policy, 1*(2), 1–11. https://doi.org/10.56542/wi.jwempo.v1.i2.a4.2024

Majebele, J. J., Yang, M., Mateen, M., & Tola, A. A. (2025). Mechanization and maize productivity in Tanzania's Ruvuma region: A Python-based analysis on adoption and yield impact. *Agriculture (Switzerland), 15*(13), 1–13. https://doi.org/10.3390/agriculture15131412

Marzouk, S. H., Tindwa, H. J., Massawe, B. H. J., Amuri, N. A., & Semoka, J. M. (2023). Pedological characterization and soil fertility assessment of the selected rice irrigation schemes, Tanzania. *Frontiers in Soil Science, 3*(May), 1–14. https://doi.org/10.3389/fsoil.2023.1171849

Matata, P., Bushesha, M., & Msindai, J. (2019). Assessing rainfall and temperature changes in semi-arid areas of Tanzania. *American Journal of Climate Change, 8*(2), 173–189. https://doi.org/10.4236/ajcc.2019.82010

Mbua, I. A., & Atta-aidoo, J. (2023). Acreage supply response of sugarcane out-growers in Tanzania: A vector error correction model (VECM) approach. *Cogent Food & Agriculture, 9*(1), 1–16. https://doi.org/10.1080/23311932.2023.2229575

Mkonda, M. Y. (2022). Awareness and adaptations to climate change among the rural farmers in different agro-ecological zones of Tanzania. *Management of Environmental Quality: An International Journal, 33*(6), 1502–1527. https://doi.org/10.1108/MEQ-10-2021-0241

Mkonda, M. Y., & He, X. (2017). Yields of the major food crops: Implications to food security and policy in Tanzania's semi-arid agro-ecological zone. *Sustainability (Switzerland), 9*(8), 34–39. https://doi.org/10.3390/su9081490

Mkonda, M. Y., & He, X. (2018). Climate variability and crop yields synergies in Tanzania's semiarid agroecological zone. *Ecosystem Health and Sustainability, 4*(3), 59–72. https://doi.org/10.1080/20964129.2018.1459868

Mkonda, M. Y., He, X., & Festin, E. S. (2018). Comparing smallholder farmers' perception of climate change with meteorological data: Experience from seven agroecological zones of Tanzania. *Weather, Climate, and Society, 10*(3), 435–452. https://doi.org/10.1175/WCAS-D-17-0036.1

Mongi, H., Majule, A. E., & Lyimo, J. G. (2010). Vulnerability and adaptation of rain fed agriculture to climate change and variability in semi-arid Tanzania. *African Journal of Environmental Science and Technology, 4*(6), 371–381.

Moshi, A. F., Nestory, M. Y., & Mlilile, B. B. (2023). Economic analysis of factors affecting maize production in Tanzania: Time series analysis. *Rural Planning Journal, 25*(1), 33–45.

Mourice, S. K., Tumbo, S. D., Nyambilila, A., & Rweyemamu, C. L. (2015). Modeling potential rain-fed maize productivity and yield gaps in the Wami River sub-basin, Tanzania. *Acta Agriculturae Scandinavica Section B: Soil and Plant Science, 65*(2), 132–140. https://doi.org/10.1080/09064710.2014.976252

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Namkunda, J., Agnes, N., & James, L. (2020). Assessing the impacts of climate change and variability on maize post-harvest system at Kongwa and Kondoa District in Tanzania. *Journal of Agricultural Biotechnology and Sustainable Development, 12*(1), 7–18. https://doi.org/10.5897/jabsd2019.0360

Nerlove, M., & Addison, W. (1958). Statistical estimation of long-run elasticities of supply and demand. *Journal of Farm Economics, 40*(4), 861–880.

Nigatu, Z. M., Fan, D., You, W., Melesse, A. M., Pu, L., Yang, X., Wan, X., & Jiang, Z. (2022). Crop production response to soil moisture and groundwater depletion in the Nile Basin based on multi-source data. *Science of the Total Environment, 825*, 1–55. https://doi.org/10.1016/j.scitotenv.2022.154007

Noorunnahar, M., Arefeen, F., Tamanna, F., & Haque, I. (2023). Does the supply response of maize suffer from climate change in Bangladesh? Empirical evidence using ARDL approach. *Journal of Agriculture and Food Research, 14*(March), 100667. https://doi.org/10.1016/j.jafr.2023.100667

Omokpariola, D. O., Agbanu-Kumordzi, C., Samuel, T., Kiswii, L., Moses, G. S., & Adelegan, A. M. (2025). Climate change, crop yield, and food security in Sub-Saharan Africa. *Discover Sustainability, 6*(1), 1–21. https://doi.org/10.1007/s43621-025-01580-4

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289–326. https://doi.org/10.1002/jae.616

Rasheed, M., & Sadozai, K. N. (2024). Assessing climate change impacts on maize production across agroecological zones of Balochistan. *Global Temperature Anomaly 1900 - 2021, 5*(4), 24–37. https://doi.org/10.47205/jdss.2024(5-IV)03

Rowhani, P., Lobell, D. B., Linderman, M., & Ramankutty, N. (2011). Climate variability and crop production in Tanzania. *Agricultural and Forest Meteorology, 151*(4), 449–460. https://doi.org/10.1016/j.agrformet.2010.12.002

Rweyemamu, M. R., Mruma, T., & Nkanyani, S. (2024). Tanzania agricultural policy profile. International Water Management Institute. https://cgspace.cgiar.org/items/cb5305d9-fccd-44d1-a727-7550374b5219

Schultze, M., Kankam, S., Sanfo, S., & Fürst, C. (2024). Agricultural yield responses to climate variabilities in West Africa: A food supply and demand analysis. *Land, 13*(3), 364. https://doi.org/10.3390/land13030364

Talib, M. N. A., Ahmed, M., Naseer, M. M., Slusarczyk, B., & Popp, J. (2021). The long-run impacts of temperature and rainfall on agricultural growth in Sub-Saharan Africa. *Sustainability (Switzerland), 13*(2), 1–16. https://doi.org/10.3390/su13020595

Utonga, D., & Kamwela, L. J. (2024). Towards sustainable maize farming in Tanzania: Understanding yield predictors among smallholder farmers. *Contemporary Research in Business, Management and Economics, 4*(April), 78–90. https://doi.org/10.9734/bpi/crbme/v4/3435g

Yuan, X., Li, S., Chen, J., Yu, H., Yang, T., Wang, C., Huang, S., Chen, H., & Ao, X. (2024). Impacts of global climate change on agricultural production: A comprehensive review. *Agronomy, 14*(7), 1360. https://doi.org/10.3390/agronomy14071360

Zhang, Z., Wei, J., Li, J., Jia, Y., Wang, W., Li, J., Lei, Z., & Gao, M. (2022). The impact of climate change on maize production: Empirical findings and implications for sustainable agricultural development. *Frontiers in Environmental Science, 10*(September), 1–10. https://doi.org/10.3389/fenvs.2022.954940

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Contribution of teachers' continuous improvement to enhancing pupils' academic achievement in Tanzania's primary schools

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ABSTRACT

The application of continuous improvement theory to teachers' professional development in primary schools generally contributes positively to pupils' academic achievement. This cross-sectional study examined the contribution of school-based and self-based teachers' continuous improvement to pupils' academic achievement while considering urbanisation and pupil-to-teacher ratio (PTR) as supporting contexts. The study utilised data collected through a structured questionnaire administered to 78 teachers drawn using stratified sampling from approximately 872 teachers, which were then analysed using multiple linear regression with the aid of SPSS. The study revealed that school-based teachers' continuous improvement, as well as the context, each makes a significant positive contribution to pupils' achievement. However, the continuous improvement of self-based teachers does not significantly contribute to pupils' achievement. The study recommends that policymakers place more emphasis on school-based teachers' continuous improvement, urbanisation, and a PTR of at most 40:1, rather than self-based teachers' continuous improvement.

Keywords: Pupils' Academic Achievement, Pupil-to-Teacher Ratio (PTR) Context, School-Based Teachers' Continuous Improvement (Kaizen), Self-Directed Teachers' Continuous Improvement, Urbanisation Context

I. INTRODUCTION

Tanzania has made concerted efforts to promote learner-centred approaches through its primary education Continuous Professional Development (CPD) and Teacher Continuous Professional Development (TCPD) initiatives. However, a teacher-centred approach still dominates, while pupils' academic achievement continues to improve steadily (Ishemo, 2021; United Republic of Tanzania - Ministry of Education, Science and Technology [URT-MoEST], 2025). This situation led us to question the contribution of CPD and TCPD in improving pupils' academic achievement. Teachers' continuous improvement (Kaizen) is a key Total Quality Management (TQM) factor that can help explain the reasons for this situation (Caraan & Caraan, 2023). It emphasises ongoing improvement in employees' performance in meeting customer needs and specifications effectively (Bouranta et al., 2020; Caraan & Caraan, 2023).

One of the structural education problems in developing countries, such as Tanzania, is the implementation of abrupt, revolutionary changes without providing social agents with sufficient time to adapt to and become familiar with the new curriculum program (Duran & Mertol, 2021). In fact, Kaizen was first employed formally in Japan. It was an inexpensive way to improve productivity and reduce costs within a limited timeframe, utilising extremely scarce resources to meet the government's demand for national reconstruction immediately after World War II (Kato & Smalley, 2015). Hence, a continuous improvement approach to educational structure changes is expected to be more appropriate for developing countries facing education resource constraints.

The Kaizen philosophy focuses on long-term benefits achieved through human effort. In teacher development programs, it corresponds to teachers' training, motivation, self-discipline, engagement, teamwork, and the sustainable achievement of learning outcomes (Arsyad, 2021; Bouranta et al., 2020; Imai, 2014), thereby achieving the highest pupil-learning outcomes. In the cognitive domain, the desired learning is staged in a taxonomy developed by Bloom (1956), which progresses from basic knowledge to comprehension, application, analysis, synthesis, and finally evaluation. Anderson and Krathwohl (2001) refined Bloom's taxonomy stages to action states that involve remembering, understanding, applying, analysing, evaluating, and finally creating. This study examined how the continuous improvement of teachers enhances pupil learning outcomes, as measured by improvements in the dimensions of Bloom's taxonomy.

Successful continuous improvement is supported by long-term orientation plans and a sustainable improvement culture that aims to eliminate waste in all organisational systems and processes, involving all people working together

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(Béndek, 2016; Bhuiyan & Baghel, 2005). Hence, it is crucial to formalise Kaizen in an organisation's programmes for quickly and significantly developing its community (Duran & Mertol, 2021). In fact, Kato and Smalley (2015) suggest that formal Kaizen stages in curriculum development should involve identifying areas for learning improvement, facilitating simple learning and teaching methods, helping people generate original ideas for improvement, carefully creating coordination plans, implementing the plans, and evaluating the results. However, the formal curriculum should not be taken as the sole factor for maintaining a curriculum based on Kaizen principles (Duran & Mertol, 2021), because Kaizen extends to personal, home, social, and work life, involving everyone in the workplace (Imai, 1986).

Continuous improvement can take a self-based or school-based form. Suárez-Barraza et al. (2021) hold that Kaizen can be applied at both the individual and organisational levels. However, the complexity of educational processes and the diversity of stakeholders can pose challenges (Suárez-Barraza et al., 2021). School-based teachers' continuous improvement is a pupil-centred approach that involves ongoing, collaborative, and active learning among teachers to improve pupils' achievement. Additionally, the constant improvement of school-based teachers is claimed to enhance knowledge sharing among teachers, which in turn improves pupils' academic achievement (Asmare, 2025; Lyengemekeja, 2016). However, Johnson and Johnson (2015) argue that collective agency involves individuals working together to achieve what they cannot achieve individually. This study aims to clarify the differences in the contributions of these two approaches to pupils' academic achievement, while considering their interactions with contextual supporting factors in primary schools in Tanzania.

The self-based teachers' continuous improvement, such as self-directed learning (SDL), emphasises autonomous, self-discipline, self-motivation, self-reflections and self-evaluation (Dahal & Bhat, 2023; Mihai, 2021). It is claimed to enhance personal skills and flexibility in critical thinking, problem-solving, and tool usage by exploring freely available knowledge and discovering new, more effective ways (Dahal & Bhat, 2023; Mihai, 2021; Murniati et al., 2023). The self-based teachers' continuous improvement is similar to a teacher-centred approach (Ishemo, 2021), which seeks to meet the teacher's teaching needs rather than the learner's needs, as advocated by the learner-centred approach in education.

Nevertheless, the mainly larger pupil-to-teacher ratio (PTR) and seemingly entrenched teacher-centred approach threaten learner-centred approaches and continuous improvement in Tanzania (Ishemo, 2021; URT-MoEST, 2025). In fact, the national average PTR in 2023 was 55:1, whereas the Pupil-to-Qualified-Teacher Ratio (PQTR) was 56:1 in Tanzania. Moreover, significant discrepancies exist across regions, with the PQTR ranging from 11:1 to 76:1, highlighting the need for the Teachers Service Commission to ensure the equitable deployment of teachers across regions and districts. (The URT- MoEST, 2025). The higher PTR and PQTR that require a PRT of 40:1 (URT-MoEST, 2025) can reduce the time teachers need to spend on continuous professional development programs and increase the likelihood of using a learner-centred approach to meet the learning needs of each pupil. In fact, the government's goal is to improve the pupil-to-qualified-teacher ratio in primary education from 61:1 in 2023 to 53:1 by 2030, which is still a considerable distance from the required ratio.

Furthermore, industrialisation is also one of the factors associated with the evolution of the continuous improvement philosophy. Edwards Deming is credited with introducing the concept of TQM in Japan in the late 1950s, with the focus on improving the performance of manufacturing companies such as Toyota Motor Corporation (Duran & Mertol, 2021). Additionally, the Japanese implemented successful TQM practices (Deming, 1986). The successful implementation of TQM in the manufacturing sector has also led educational institutions to adopt TQM, aiming to improve the learning process in education (Duran & Mertol, 2021; Sfakianaki, 2019). Currently, Kaizen supports more digitalised industrial processes for organisational success (Dang-Pham et al., 2022). However, many primary schools, particularly in rural areas, still lack reliable electricity, which is necessary for most ICT devices (URT-MoEST, 2025). Furthermore, schools in rural areas tend to receive less capitation funds compared to those in urban areas, as the distribution is based solely on the number of students without considering associated fixed costs (The URT-MoEST, 2025). Hence, the impact of industrialisation and the PTR context on pupil-learning outcomes was also examined.

1.1 Statement of the problem

Different studies have demonstrated that teachers' continuous improvement is a critical and successful factor in pupils' learning achievement (Asim et al., 2019; Asmare, 2025; Mohamed et al., 2024; Ochar et al., 2025). However, no study examined the contribution of school-based and self-based teachers' continuous improvement to pupils' academic achievement in primary schools in Tanzania, as covered by this study, particularly in the context of urbanisation and PTR.

1.2 Research Objectives

i. To determine the contribution of school-based teachers' continuous improvement on pupils' academic achievement in the context of urbanisation and pupil-to-teacher ratio in Tanzania.
ii. To examine the contribution of self-based continuous improvement for workers on pupils' academic achievement in the context of urbanisation and pupil-to-teacher ratio in Tanzania.

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II. LITERATURE REVIEW

2.1 Theoretical Review

The Continuous Improvement (also known as Kaizen) philosophy is a quality movement initiated by Shewhart in the 1920s, based on the Plan-Do-Check-Act (PDCA) cycle. In 1950, Edwards Deming further expounded his philosophy of TQM, as established by Zangwill and Kantor (1998). Since the theoretical framework for continuous improvement is weak (Bhuiyan & Baghel, 2005; Zangwill & Kantor, 1998), it remains primarily supported by contingency theory, learning curve theory, and TQM philosophy. The contingency theory claims that the best process for the best solution is contingent on the particular situation, such that an improvement that works well in a given organisation context or period might not work well in other contexts or periods (Netland, 2016). Social cognition theory is closely connected to self-efficacy theory and organisational learning theory, in that individuals learn by doing or acquire new knowledge and behaviours by collaborating with others (Bandura, 2001). Besides, the learning curve theory illustrates how performance (output or cost reduction) improves over time as individuals gain experience or learn from performing the input; however, it does not suggest how to reduce costs or how to achieve continuous improvement, as constant improvement does (Zangwill & Kantor, 1998). In the TQM philosophy, Deming used the term "continual improvement" (regular check and adjust), which is in harmony with the PDCA (Plan-Do-Check-Act) cycle, rather than "continuous" (non-stop) improvement without pause (Deming, 1986).

This study adopted the TQM philosophy, which describes continuous improvement as the small, ongoing, systematic development of processes brought about by the engagement of all employees, enabling them to meet or exceed customers' needs effectively (Duran & Mertol, 2021; Shanmuganathan & Sathishkumar, 2019). Hence, the contribution of continuous improvement (or kaizen) to teacher-pupil learning outcomes was examined in this study. In this case, a customer-focused continuous improvement initiative targets teachers, who are then expected to enhance pupil learning achievement through improved teaching skills.

2.2 Empirical Review

Duran and Mertol (2021) also argued that collective agency requires collective synchronisation, coordination, cooperation, as well as a collective goal resulting in collective goal-directed behaviour in which the actions of the individual agents must be directed at the same goal. Their behaviour must be coordinated in a specific way in terms of behavioural and cognitive dimensions. They conducted a qualitative study based on a document analysis to analyse different perspectives of kaizen in curriculum development between Japanese culture and Western culture. They found that in the West, perceived kaizen improvement is driven by stakeholders, depending on their respective positions and roles. In contrast, the Japanese perceive Kaizen as improvement brought about by all staff and stakeholders working in harmony together as equal, valuable partners, which gives the Japanese a competitive advantage in the global market.

The success of teachers' CPD initiatives varies across countries, depending on the context that supports them. In Rwanda, for example, CDP is successful because the government has invested in information and communication technology (ICT) systems that facilitate teachers' CPD (Nkundabakura et al., 2024). In Kenya, teachers' CDP is also successful because the government require teachers to meet established CPD points to be promoted in the teaching profession (Shayo & Sonola, 2025). Kariuki and Mbugua (2018) examined the role of teacher professional development in Kenya using a parallel mixed design, based on surveys of 197 teachers from public primary schools and 144 teachers from private primary schools. The study found that teacher participation in collaborative professional development improves their teaching skills. Additionally, Yangambi (2021) surveyed 108 teachers in the Democratic Republic of the Congo to examine the role of in-service training for primary school teachers on pupils' academic achievement in Kinshasa and found a positive association between them at a high cost.

Asim et al. (2019), who employed regression analysis to investigate the impact of teachers' improvement on pupils' academic achievement, based on data from 400 public primary schools in Tanzania, found that teachers' improvement enhances pupils' academic achievement. Even though the Tanzania government introduced the National Framework for Teacher Continuous Professional Development (TCPD) (The URT- MoEST, 2025), the CPD is not successful compared to that in Kenya and in Rwanda, possibly due to context factors such as gender, age, education level, urbanization level, school ownership or PTR which do not support pupils' academic achievement. For example, Asim et al. (2019) found that primary schools with adequate physical facilities achieve higher learning outcomes, while schools in urban areas scored about 75% on average, versus 61% of primary schools in rural areas, even after controlling for amenities such as piped water, road access, and the number of pupils.

III. METHODOLOGY

3.1 Research Design and Approach

This quantitative survey study was conducted in the Missenyi District of Kagera Region, Tanzania, where various factors, such as PTR and urbanisation level, as defined by the United Republic of Tanzania – Ministry of

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Education, Science, and Technology (URT-MoEST, 2025), are essential for the regression analysis. It employed explanatory (causal-effect) research design as recommended by Creswell (2014) because the study sought to examine the contributions, as effects, of school-based and self-based teachers' continuous improvement to pupils' academic achievement based on urbanisation and PTR context, based on regression analysis with the aid of the Statistical Package for Social Sciences (SPSS).

3.2 Sampling Strategy

The study employed stratified sampling to select a diverse group of 78 teachers from an initial pool of 872 primary school educators. This approach guaranteed that each stratum was represented through random or convenience sampling. These teachers were chosen for their extensive experience in advancing teaching practices and their ability to assess students' academic progress. Their insights are highly valuable, as they are actively involved in enhancing educational results in primary schools. The resultant sample size of 78 teachers exceeds the minimum sample size of 50 members recommended by VanVoorhis and Morgan (2007) for regression analysis.

3.3 Data Collection

The study employed a structured questionnaire to collect quantifiable data systematically aligned with the research objectives. After obtaining necessary permissions from the District Executive Director (DED), data was collected in 2024 from 78 teachers using a structured questionnaire, as outlined in Appendix I.

3.4 Data analysis

Multiple linear regression, a dependable method for analysing the relationships between one dependent variable and multiple independent variables, was used in the analysis of quantitative data with the help of SPSS software. This approach provides valuable insights into the factors that influence the results. The findings can inform future policies and interventions, thereby deepening our understanding of the educational environment.

3.5 Ethical Considerations

Besides obtaining authorisation from the DED, the study also adhered to ethical standards by prioritising honesty, integrity, and responsibility throughout all stages of the research. Central to our approach was the securement of informed consent, which upheld participant autonomy. We were committed to transparency in data reporting, including the disclosure of any conflicts of interest. Furthermore, we ensured compliance with relevant ethical guidelines and safeguarded confidentiality by anonymising the data. The rights and well-being of research participants remained at the forefront of our efforts.

IV. FINDINGS & DISCUSSION

4.1 Findings

This section presents, analyses and discusses the study findings. It begins with the demographic profile before progressing to detailed statistical findings.

4.1.1 Demographic Characteristics

The demographics helped determine a better context for pupils' academic achievement, as presented in Table 1.

Table 1

Demographic Characteristics

Demographic	Respondents' group	Total members	Percent
Gender	Male	44	56.4
	Female	34	43.6
Age	Youth age (18-35 years)	38	47.7
	Adult age (35 years and above)	40	51.3
Education	Less than bachelor	61	78.2
	At least bachelor	17	21.8
School Ownership	Public (government)	57	73.1
	Private	21	26.9
Urbanization	Rural	24	30.8
	Middle	32	42.3
	Urban	21	26.9
Total	**sample size**	**78**	**100%**

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The demographic characteristics show that 56.4% of teachers were male, while 43.6% were female. Additionally, 47.7% of teachers were youth, and 51.3% were adults. Additionally, 78.2% of all teachers had an education level of less than a bachelor's degree, while 21.8% had a bachelor's degree or higher. Furthermore, 73.1% of all teachers were from public schools, and 26.9% were from private schools. Moreover, 30.8% of all teachers are in rural areas, 42.3% in middle-urbanised regions, and 26.9% in urbanised areas.

4.1.2 Validity and Reliability of the Instruments

The validity and reliability of the instruments listed in Appendix I were evaluated before using the constructs in the regression analysis. Several studies supplied demographic data, including pupils' academic performance, and contextual information (Asim et al., 2019; Anderson & Krathwohl, 2001; Lyengemekeja, 2016; URT-MoEST, 2025). Items related to ongoing school environment improvements were then developed (Sfakianaki, 2019; Caraan & Caraan, L., 2023). Following Schindler's (2022) guidance, a management expert and an education expert reviewed the content validity of each construct, which was confirmed by both. Additionally, Cronbach's alpha values above 0.7 demonstrated the reliability of the measurement tools, as confirmed by the SPSS reliability analysis of their constructs (Lyengemekeja, 2016; Schindler, 2022).

4.1.3 Regression Analysis

Regression analysis was conducted using SPSS, with the pupils' academic achievement serving as the dependent variable. In contrast, the independent variables comprised both school-based and self-based teachers' continuous improvement and context supporting learning. The findings were presented in Table 2.

Table 2

Regression Analysis Findings

The dependent variable is pupils' achievement	Beta	Std. Error	Std Beta	t	Sig.	Collinearity	
						Tolerance	VIF
Independent variables:							
(Constant)	1.910	.298		6.413	.000		
School-based teachers' continuous improvement	.495	.091	.588	5.456	.000	.575	1.740
Self-based teachers' continuous improvement	-.134	.088	-.162	-1.516	.134	.580	1.724
School context support	.230	.042	.454	5.526	.000	.986	1.014

Note: R-Square = 0.507; Standard error of the Estimate = 0.470; F = 25.35, df = 77, Sig = .000; The determinant is significant (*) at 0.05 where p-value ≤ 0.05

The coefficient of determination (R-squared) indicates that 50.7% of the variation in the dependent variable is explained by the variation in the three independent variables. Moreover, the model does not exhibit multicollinearity problems, as the VIFs of all independent variables are less than five. Moreover, the F-value of 25.35 at df = 77 and a significance level of p = .000 implies that the regression model provides a significant fit to explain the impact of three independent variables on pupils' achievement. The context that supported the explanation of the contribution of both school-based and self-based teachers 'continuous improvement to pupils' academic achievement was a combination of urbanisation and the required PTR context. The supporting context revealed a significant contribution to pupil-learning achievement (β = .230, p-value = .000).

4.2 Discussion

4.2.1 Contribution of School-Based Teachers' Continuous Improvement

The primary objective of this study was to investigate the impact of school-based teachers' continuous improvement on pupil academic achievement in the context of urbanisation and pupil-to-teacher ratios in primary schools in Tanzania. The regression analysis revealed that under a supporting context, the school-based teachers' continuous improvement has a significant positive contribution to pupils' academic achievement at a significance level of .05 (β = .495, p-value = .000). This result is supported by different studies (Asim et al., 2019; Asmare, 2025; Mohamed et al, 2024; Ochar et al., 2025) and is similar to the positive impact of a learner-centred approach on pupil-academic achievement (Ishemo, 2021). Additionally, the findings reveal that the contribution of school-based teachers' continuous improvement to pupils' academic achievement (standardised β = .588) was greater than that of the supporting context (standardised β = .454) and that of self-based teachers' continuous improvement (standardised β = -.162). This can explain why pupils' academic achievement in Tanzania improved despite the dominance of a teacher-centred approach (Ishemo, 2021).

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4.2.2 Contribution of School-Based Teachers' Continuous Improvement

The second objective of this study was to examine the contribution of both self-based teachers' continuous improvement to pupil academic achievement in the context of urbanisation and pupil-to-teacher ratio in primary schools in Tanzania. The regression analysis revealed that under a supporting context, the self-based teachers' continuous improvement has no significant contribution to pupils' academic achievement at a significance level of .05 (β = -.134, p-value = .134). However, this insignificant contribution contradicts school-based teachers' continuous improvement and other different studies (Asim et al., 2019; Asmare, 2025; Mohamed et al, 2024; Ochar et al., 2025), most likely due to different contexts used and their failure to differentiate the contribution of school-based and self-based teachers' continuous improvement. The insignificant contribution of self-based teachers' continuous improvement is similar to a teacher-centred approach, which tends to enhance personal teachers' learning outcome (Dahal & Bhat, 2023; Mihai, 2021; Murniati et al., 2023) but can hardly contribute to pupils' academic achievement.

The study highlights the need to emphasise the continuous improvement of school-based teachers, particularly in light of increasing urbanisation, rather than relying solely on self-based teachers' continuous improvement to ensure better academic achievement for pupils. This aligns with Shayo and Sonola (2025), who demonstrated the need for a context that fosters CPD in Tanzania. It is thus crucial to ensure that the context supports school-based teachers' continuous improvement by increasing the urbanisation level while maintaining a PTR of 40:1.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

Based on study findings, it is apparent that both 'school-based teachers' continuous improvement and supporting context have a significant positive bearing on pupils' academic achievement, but not the self-based teachers' continuous improvement. The conclusion highlights the need to differentiate the contributions of school-based and self-based teachers' continuous improvement, where school-based teachers' continuous improvement has a significant contribution to pupils' academic achievement. In contrast, self-based teachers' continuous improvement has no significant contribution.

5.2 Recommendations

Hence, primary education regulators, managers, leaders, policy makers and government in Tanzania can help to improve the learning process and pupils' academic achievement in Tanzania through knowledge contributed in this study by emphasizing on formal school-based teachers' continuous improvement, enhancing urbanization level and fostering required pupils to teacher ratio (PTR) of 40:1 instead of emphasizing on self-based teachers' continuous improvements.

REFERENCES

Anderson, L. W., & Krathwohl, D. R. (2001). *A taxonomy for learning, teaching and assessing: A review of Bloom's taxonomy of educational objectives* (Complete edition). Longman.

Arsyad, A. (2021). The educational value of kaizen quality management. *Lentera Pendidikan Jurnal Ilmu Tarbiyah Dan Keguruan*, *24*(1), 131. https://doi.org/10.24252/lp.2021v24n1i13

Asim, S., Chugunovu, D., & Gera, R. (2019). Student learning outcome in Tanzania's primary schools. *World Bank Group Reports*, 31465.

Asmare, M. A. (2025). Teachers' experiences of continuous professional development: Implications for policy and practice. *Social Sciences & Humanities Open*, *11*, 101514.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, *52*(1), 1–26.

Béndek, P. (2016). *Beyond lean. A revisited framework of leadership and continuous improvement*. Springer International Publishing.

Bhuiyan, N., & Baghel, A. (2005). An overview of continuous improvement: From the past to the present. *Management Decision*, *43*(5), 761–771.

Bloom, B. S. (1956). *Taxonomy of educational objectives, handbook I: The cognitive domain*. David McKay Co. Inc.

Bouranta, N., Psomas, E., & Antony, J. (2020). Findings of quality management studies in primary and secondary education: A systematic literature review. *The TQM Journal*, *33*(3), 729–769.

Caraan, H. S., & Caraan, L. G. A. (2023). Understanding kaizen in basic educational institutions in Metro Manila, Philippines. *Review of Integrative Business and Economics Research*, *13*(2), 239–250.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative and mixed methods approaches*. Sage Publishers.

Dahal, A., & Bhat, N. (2023). Self-directed learning, its implementation, and challenges: A review. *Nepal Journal of Health Science*, *3*(1), 102–115.

Licensed Under Creative Commons Attribution (CC BY-NC)

Dang-Pham, D., Hoang, A., Vo, D., & Kautz, K. (2022). Digital kaizen: An approach to digital transformation. *Australasian Journal of Information Systems, 26*, 1–20. https://doi.org/10.3127/ajis.v26i0.3851

Deming, W. E. (1986). *Out of the crisis*. Cambridge University Press.

Duran, V., & Mertol, H. (2021). Kaizen perspective in curriculum development. *Asian Journal of Education and Training, 6*(3), 384–396.

Imai, M. (1986). *Kaizen: The key to Japan's competitive success*. Random House.

Imai, M. (2014). *Gemba kaizen: A commonsense approach to a continuous improvement strategy*. McGraw-Hill Professional.

Ishemo, R. (2021). Progress of the implementation of the learner-centred approach in Tanzania. *International Journal on Integrated Education, 4*(4), 55–72.

Johnson, D. W., & Johnson, R. T. (2015). Theoretical approaches to cooperative learning. In R. Gillies (Ed.), *Collaborative learning: Developments in research and practice* (pp. 17–46). Nova.

Kariuki, M. G., & Mbugua, Z. K. (2018). Influence of student motivation by teachers on academic performance in public secondary schools in Nyeri and Kirinyaga Counties, Kenya. *Pedagogical Research, 3*(4), 4.

Kato, I., & Smalley, A. (2015). *Toyota kaizen methods: Six steps to improvement*. Taylor & Francis Group.

Lyengemekeja, B. S. (2016). The influence of academic leadership on the intention of the university students to apply strategic innovative behaviour [PhD thesis, Dodoma University].

Mihai, O. (2021). Self-education and lifelong learning. *International E-Journal of Advances in Social Sciences, 7*(19), 142–145.

Mohamed, H., Arulpragsam, J., & Hussain, M. B. (2024). Impact of teachers' professional development programme on students' performance in secondary schools. *Journal of Education and Practice, 13*(3), 4192–4206.

Murniati, C. T., Hartono, H., & Nugroho, A. C. (2023). The challenges, supports, and strategies of self-directed learning among college students. *Journal of Education and Learning, 17*(3), 365–373.

Netland, T. (2016). Critical success factors for implementing lean production: The effect of contingencies. *International Journal of Production Research, 54*(8), 2433–2448.

Nkundabakura, P., Nsengimana, T., Uwamariya, E., Nyirahabimana, P., Nkurunziza, J. B., Mukamwambali, C., Dushimimana, J. C., Nsabayezu, E., Twahirwa, J. N., & Ndihokubwayo, K. (2024). Contribution of continuous professional development (CPD) training programme on Rwandan secondary school mathematics and science teachers' pedagogical, technological, and content knowledge. *Education and Information Technologies, 29*(4), 4969–4999.

Ochar, V. A., Mbagaya, C. V., & Odiwour, W. H. (2025). Influence of teacher professional development on students' academic achievement in secondary schools in Seme Subcounty, Kisumu County. *Journal of Research Innovation and Implications in Education, 9*(2), 1053–1059.

Schindler, C. (2022). *Business research methods*. McGraw-Hill/Irwin.

Sfakianaki, E. (2019). A measurement instrument for implementing total quality management in Greek primary and secondary education. *International Journal of Educational Management, 33*(5), 1065–1081.

Shanmuganathan, J., & Sathishkumar, A. S. (2019). A systematic approach of total quality management practices towards operational excellence with reference to auto components manufacturing companies. *International Journal of Research in Business Studies and Management, 6*(9), 9–14.

Shayo, J. H., & Sonola, V. (2025). Enhancing teachers' continuous professional development in Tanzania: Challenges, strategic interventions, and regional comparisons. *Journal of Education and Practice, 16*(7), 2222–1735.

Suárez-Barraza, M., Miguel-Dávila, J., & Morales-Contreras, M. (2021). Application of kaizen-kata methodology to improve operational problem processes: A case study in a service organization. *International Journal of Quality and Service Sciences, 13*(1), 29–44.

The United Republic of Tanzania - Ministry of Education, Science, and Technology (URT-MoEST). (2025). *Education sector development plan 2025/26–2029/30*. Government Printers.

VanVoorhis, C. R., & Morgan, B. L. (2007). Understanding the power and the rules of thumb for determining the sample size. *Tutorials in Quantitative Methods for Psychology, 3*, 43–50.

Yangambi, M. W. (2021). Teacher professional development and student achievement in a developing country. *Creative Education, 12*, 2283–2300.

Zangwill, W. I., & Kantor, P. B. (1998). Toward a theory of continuous improvement and the learning curve. *Management Science, 44*(7), 910–920.

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APPENDIX I: QUESTIONNAIRE ITEMS AND STATISTICS

A: Quality of Measurement Tool for Each Construct

The Likert scale used in the measurement tool for each construct is as follows: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Undecided (UD), 4 = Agree (A), and 5 = Strongly Agree (SA). Note also that STD =Standard deviation.

Pupils' achievement items	**Mean**	**STD**
Pupils in primary school are creative in doing things.	3.49	1.016
Pupils in primary school do well on examinations.	3.91	1.022
Pupils in primary school investigate things effectively.	3.44	1.100
Pupils in primary school remember well what they learn.	3.73	.976
Pupils in primary school can explain well what they learn.	3.71	1.008
Pupils in primary school use what they learned well.	3.90	.920
Pupils in primary school make good decisions.	3.71	.913
Pupils in primary school are enthusiastic to learn more.	4.12	.738
Mean of pupils' academic achievement.	3.75	.997
Reliability measured by Cronbach's Alpha (α) = .845		
School-based teachers' continuous improvement items	**Mean**	**STD**
Tools and services offered to teachers are constantly improving their teaching	3.36	1.044
Daily school activities constantly improve teachers' skills	3.26	1.133
In-service training helps teachers improve their teaching skills	3.22	1.276
My school leaders always help each teacher to improve skills.	3.29	1.207
My school leaders always ensure that each teacher's skills are improved.	3.71	1.129
Always, teachers use better teaching strategies that each pupil enjoys.	3.81	1.106
Teachers' collaboration here constantly improves teaching methods	3.82	1.041
Means of school-based teachers' continuous improvement	3.55	1.136
Reliability measured by Cronbach's Alpha (α) = .812.		
Self-based teachers' continuous improvement items	**Mean**	**STD**
I mainly use my effort to improve the teaching process	3.64	1.105
I always improve my teaching by listening to each pupil carefully	3.94	.972
I always value pupils and their ideas in improving my teaching	4.06	.931
Means of self-based teachers' continuous improvement	3.88	1.005
Reliability measured by Cronbach's Alpha (α) = .715.		

B: Quality of Measurement Tool for Supporting Context

The Likert scale used for urbanisation levels: 1 = rural, 2 = Middle rural, and 3 = urban. The pupil-to-teacher ratio (PRT), as inquired from school leadership for each school, was ranked from the best PRT (e.g., 20:1) to the worst PRT (e.g., 64:1).

Supporting context items	**Mean**	**STD**
Urbanisation level of the school surroundings	2.86	1.657
Rank of pupils to pupil-to-teacher ratio at the school, where 1 is the best ratio	3.00	1.162
Mean of supporting context for pupils' academic achievement	3.88	1.005
Reliability measured by Cronbach's Alpha (α) = .810.		

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Statistical analysis of the impact of e-procurement practices and technological capability on innovation and organizational performance: Evidence from Ghana

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ABSTRACT

Within the specific context of the dynamic capabilities theory, this paper examines the role of e-procurement practices and technological adequacy in innovation and organizational performance within the institutions of the public sector in Ghana. The current study used a cross-sectional design to collect empirical data in the form of organizations that use a system of e-procurement. The target population was the procurement officers and the staff whose work is directly related to procurement in the selected organizations that are in the public sector. The purposive sampling method was applied to select respondents who had relevant experience, and a sample of 122 people was obtained. A structured questionnaire was used to capture data based on the perception of respondents of e-procurement practices, technological capability, innovation, and organizational performance. Preliminary analysis was carried out with the help of descriptive statistics, and the structural equation modelling was conducted to analyze the measurement model and to determine the structural association between the variables of the study. The results have shown that technological capability is a significantly higher determinant of innovation compared to e-procurement practices, and its effects on organizational performance are rather indirect, i.e., via innovation, but not through a direct channel. E-procurement practices have a great positive influence on organizational performance, but in comparison, the effect on innovation is not so strong. These findings indicate that innovation plays a key mediating role in the performance outcomes in digitally enabled procurement settings. The research finds that enhancing technological capability is critical to promoting innovation that in itself improves performance within the government. Based on these insights, the study recommends that public sector institutions increase investment in technological infrastructure to strengthen their capability base, prioritize continuous capacity building to improve the digital competencies of procurement personnel, and integrate innovation-driven approaches into e-procurement strategies to maximize performance gains.

Keywords: E-Procurement, Innovation, Organization, Structural Equation Modelling

1. INTRODUCTION

Procurement has seen severe changes in recent years, and the lack of technological capacity was defined as one of the biggest barriers to the development of the individual organisations as well as the entire nation (Figueiredo, 2016). Modern organisations are increasingly relying on such innovations to provide cost effective solutions, customer loyalty, as well as creative strategies. The introduction and use of information technologies have an enormous effect on organisational performance, as it has triggered a transition toward sustainable e-procurement methods, rather than conventional ones, due to the increasing power of technological potential and innovations (Ibem et al., 2016). These innovations do not only make procurement processes smoother, but they also foster various environments in which solution innovation is encouraged. The procurement and acquisition management field has significantly evolved due to the technological inventions. Contemporary digital acquisition management systems are now accessible in real time to procurement data, contract requirements and supplier relations and, as such, give stakeholders the ability to oversee and control tendering processes with more efficiency.

These systems streamline administrative operations by automating them and enhance increased transparency in sourcing decisions. According to Harland et al. (2021), digitalisation has strengthened procurement resilience and flexibility and allowed organisations to quickly make changes in times of disruption, including those associated with the COVID 19 pandemic. The centralised acquisition management systems enhance the visibility of contracts and performance control through the adoption of complex analytics and data visualisation strategies. The use of predictive analytics in procurement portals is one of the ways through which organisations have been able to minimise waiting times, as well as enhance accuracy in their supply chains, especially when there are many suppliers in the supply chain. They provide a customisable dashboard that will unify procurement performance indicators, helping managers make

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contracts aligned with the organisational goals and objectives and comply with the regulatory standards and contractual obligations (Shaw et al., 2022).

In addition to realizing efficiency benefits, acquisition portals reduce operational and strategic risks across the supply chain by a significant margin. Audit trails and real time visibility help in the early detection of risks and strategic diversification of suppliers. Advances in blockchain technology and artificial intelligence also enhance the security and auditability of their procurement by ensuring the stability of their data on transactions (Kshetri & Voas, 2022). As Ahmad et al. (2019) note, Technological Capability (TC) concept implies the usage of all tools facilitating the innovation process and acquisition of theoretical and practical competence. The power of technological capability is realised both directly and indirectly but ultimately, the power has a great influence on organisational performance. The weaknesses peculiar to e-procurement in Ghana are lack of legal frameworks, opposition by users and practitioners, inability to computerize procurement processes, expensive acquisition, ineffective infrastructure, and sensitivity issues. These issues impede the potential and advantages of e-procurement systems, which form a dichotomy between the barriers to the adoption of e-procurement and the advantages that the organisations have reaped after adopting the system. The benefits include cost, sharing of information and increased transparency, which is essential to the modern organisational performance (Oteki, 2019).

Turnaround time in procurements has been a phenomenon in the Ghanaian case, which has resulted in a shortfall in monetary and time costs. Such delays highlight the importance of effective e-procurement activities to facilitate business operations and help minimize wastage. This research will fit in the existing literature by empirically exploring how e-procurement could be used to improve the performance of procurement in public sector organisations in Ghana, a place where the subject has not been extensively researched, especially in developing economies. Despite the fact that the previous studies have largely relied on the adoption of e-procurement in the private sector or in developed economies, this study provides the contextual observation of the impacts of e-procurement on procurement efficiency, transparency, and accountability within the public sector setting. The study offers evidence-based suggestions to policy makers and practitioners through quantitative analysis and primary data hence filling both the geospatial and empirical gaps in the existing literature on e-procurement and government performance.

1.1 Statement of the Problem

Existing studies have explored e-procurement, technological capabilities and organization performance through empirical observation but most of the time, it is lacking a sound theoretical context. This part is a synthesis of key viewpoints and defines the gaps that are leading to the current investigation. One of the existing opinions is that e-procurement enhances the performance of organizations and cultivates efficiency, minimising expenses, and improving transparency (Ahmad et al., 2019; Daniel & Ngugi, 2018; Oteki, 2019). Even more recent studies by Demeter et al. (2025) prove that supplier-group stability produces a quantifiable effect on procurement performance in the realm of the public sector, thus, proving the topicality of the institutional and capability-based models. However, this line of research is prone to viewing e-procurement as a technical intervention project and not as an integration of larger organizational capacity being blind to how such technologies inter-relate with underlying resources and competencies. Conversely, the theory of dynamic capabilities argues that performance gains are a result of the ability of an organisation to be flexible and make internal capabilities realign to fit the requirements of the environment (Teece et al., 1997).

In this view, technological capability is not merely a tool, an asset of strategy that enables innovation and agility (Wu et al., 2020; Lestari & Ardianti, 2019). In spite of the fact that a number of studies document the fact that technological capability increases performance (Otiso, 2017; Melián et al., 2020), they often do not consider the mediating role of innovation. As a result, there is a theoretical gap; is it that better performance occurs since organisations have advanced technologies or is better performance as a result of the fact that the better technologies bring about an innovativeness which in turn leads to better performance? Our paper interacts directly with this question by developing and testing a mediation model whereby the technological capability and e-procurement practices mediate the consequences of innovation on the performance of organisations. The strategy is a response to the academic demands to move beyond the descriptive accounts and shift to theory formation by incorporating the explanatory mechanisms (Sandberg & Alvesson, 2021; Rouse et al., 2025). The study was placed in the under-researched setting of the public sector procurement in developing nations thus providing a theoretical understanding of how dynamic capabilities should work in the face of institutional limitations. This contribution is a continuation and addition to existing discussions about the scalability and adaptability of the theories of supply chain management in different settings (Cornelissen et al., 2024; Pflueger et al., 2024).

1.2 Research Objective

The objective of this study is to investigate the impact of e-procurement practices and technological capability on both Innovation and Organizational Performance.

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II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Dynamic Capabilities Theory

Dynamic Capabilities Theory (Teece et al., 1997) provides a theoretical framework through which it is possible to understand how organisations change and strategically use internal resources in order to gain competitive advantage. The theory highlights the value of technological capability as a competitive tool contributing to organisational agility and innovation (Wu et al., 2020; Lestari & Ardianti, 2019). Reconstrueing technological capability as more than an instrumental tool in technical capability, the theory can be seen to play a crucial role in helping firms re-arrange resources and react appropriately to environmental changes.

2.1.2 Innovation-Mediation Framework

Recent theoretical developments support the mediation between the technological capability and organisational performance by innovation. This opinion spotlights that technological ability is the greatest influence on performance outcomes, but indirectly through the increase in innovation capacity in organisations (Sandberg & Alvesson, 2021; Rouse et al., 2025). The framework poses a more sophisticated question about the way in which digital and technological resources can be converted into direct organisational benefits by means of emergent innovative processes.

2.2 Empirical Review

Numerous empirical studies report the beneficial effects of e-procurement to organisational performance, cost management, and transparency (Ahmad et al., 2019; Daniel & Ngugi, 2018; Oteki, 2019). These researches affirm that e-procurement activities simplify procurement processes and promote accountability in both the government and the business world in general. As shown by Melin-Alzola et al. (2020) and Wu et al. (2020), an organisation that has a greater technological endowment exhibits a greater innovation performance, which further develops greater organisational performance. This claim is supported by the research by Runtuk et al. (2025) that highlights the more significant effect of technological capability on the innovation over the e-procurement in the organisations of the government. The operational efficiencies brought by e-procurement have a relatively low effect on performance of organisations in comparison with a mediated effect of technological capability through innovation (Demeter et al., 2025; Otiso, 2017). Such persistent issues as infrastructural constraints, the unwillingness to use technology, and inadequate supportive legislation are also difficult to overcome in the context of developing countries, including Ghana (Oteki, 2019; Kshetri & Voas, 2022). However, the combination of blockchain and AI technologies has already initiated the improvement of procurement security and audit to open opportunities to surpass these barriers (Shaw et al., 2022).

Improved literature on e- procurement and technological capabilities notwithstanding, there exists a vast disparity on the mediating role of innovation on the relationship between innovation and organisational performance especially in the institution of the public sector in developing countries. Most studies that are carried out before largely concentrate on the private sector or view e-procurement as an independent technical treatment. This gap has been filled in the present paper through empirical modelling and testing innovation as a mediator, therefore, supplying more theoretical and contextual understanding that can be considered relevant in the context of digital transformation of public procurement systems in resource-constrained settings.

III. METHODOLOGY

3.1 Research Design

The current study used a cross-sectional design to collect empirical data in the form of organizations that use a system of e-procurement. This methodological decision was considered to be suitable as it allows gathering the data at a single period in time among those participants who are actively working with e-procurement systems in the Ghanaian state-run organizations. By extension, the design makes it easy to appraise efficiently the interrelations between e-procurement practices, technological capability, innovation and organizational performance. Furthermore, it in line with the requirements of Structural Equation Modeling which requires that the data must be quantitative and has to accumulate over a specified period.

3.2 Target Population and Sample Size Determination

The target population included the procurement officers and personnel who are directly engaged in procurement-related processes in the Ghanaian institutions in the public sector. They were chosen based on their experience in the area of operations in e-procurement systems such that the information that would be obtained would be both pertinent and meaningful. It was to this effect that the sample size was settled on 122 respondents as a result of a pragmatic evaluation of accessibility and willingness of the respondents to take part in the study. The sample size

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meets the lower limit of the confidence threshold of latent-variable analysis in Structural Equation Modeling, thus permitting a strong estimation of model parameters.

$$n_0 = \frac{z^2 p(1-p)}{e^2}$$

Where:

Z = for 95 percent confidence, $p = 0.5$, $e = 0.05$

$$n_0 = \frac{(1.96)^2 \times 0.5 \times (1-0.5)}{(0.05)^2}$$

n_0 =384.16

$$N = \frac{\left(\frac{n}{n_0}\right) - 1}{n_0 - 1}$$

$$N = \frac{\left(\frac{122}{384.16}\right) - 1}{384.16 - 1}$$

$$N = \frac{2.14967213}{383.16}$$

N≈178.31

3.3 Sampling Method

Purposive sampling was used in the study to choose participants who worked as procurement officers or other employees directly engaged in procurement operations in Ghanaian public sector organizations. We chose this strategy to ensure that only participants in the study possessed relevant knowledge and expertise in e-procurement systems. A list of public sector organisations was provided by the Public Procurement Authority (PPA) and the administrative contacts were used to find procurement personnel working in each organisation. Since respondents were selected based on their positions this meant that the information was collected on individuals who were actively involved in the e-procurement processes. Out of the available 122 respondents were the ones chosen based on accessibility and their wish to take part hence portrayed the objectives of the study.

3.4 Data Collection Instruments and Procedures

Data collection was done in a structured questionnaire that was used to measure e-procurement practices, technological capability, innovation, and organisational performance. The questionnaire used a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) in order to portray views and opinions of the respondents. This scale made the response easy and made it possible to conduct a detailed analysis of the degree of agreement. The questionnaire was sent through electronic means in order to have high response rate.

3.5 Data Analysis Technique

The method of data analysis involved an initial descriptive analysis, which involved some summary of data using percentages. In the main analysis, Structural Equation Modelling (SEM) was used and such software as R were used. The measurement model under review was to establish that the variables measured reflected the constructs. The hypothesis relationship of e-procurement practice, technological ability, innovation, and organisational performance was then tested using the structural model. Lastly, the comparative fit index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Educational Approval (RMSEA), and Standardised Root Mean Square Residual were considered as important indices in determining the adequacy of the model to facilitate the strength of the model.

3.6 Model Description

Structural Equation Modeling (SEM) frequently utilizes moderation and mediation analysis to elucidate the relationships. The incorporation of moderation and mediation in Structural Equation Modelling (SEM) is common, and it is used to explain the relationship between variables. In mediation analysis, one tries to establish whether the relationship between an Independent Variable (IV) and a Dependent Variable (DV) is mediated, or moderated, by a third variable, the Mediator (M). The path model typically has three variables which are the Independent Variable (IV), the mediator and the Dependent Variable (DV). The moderation analysis is used to examine how the interrelationship between the independent variable (X) and the dependent variable (Y) is altered by the level of a third variable, referred to as the moderator (Z). The moderator variable (Z) interacts with the independent variable (X) in influencing the dependent variable (Y). In some cases, both the moderation and mediation effects can be combined into one SEM framework. Through this model, it is possible to establish the impact of a third variable on the effect of the mediator.

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Mediation path:

$$M = \alpha_0 + \alpha_1 X + \varepsilon M \quad (1)$$

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \varepsilon Y \quad (2)$$

Moderation Path:

$$Y = \beta_0 + \beta_1 X + \beta_2 M + \beta_3 Z + \beta_4 (X \times Z) + \varepsilon Y \quad (3)$$

Where β_4 represents the interaction effect, testing if the relationship between X and Y or M and Y is moderated by Z.

3.7 Ethical Considerations

The research was conducted in conformity to ethical standards of research in order to protect the integrity and rights of the participants. There was an informed consent, where the participants were adequately informed about the purpose of the study, their rights and confidentiality of their responses. All the data gathered were treated with many secrets and were only used in research. The responses were voluntary and the participants were allowed to withdraw any time with no repercussions. These measures were aimed at fostering the creation of an ethical research atmosphere and promoting open and honest involvement.

IV. FINDINGS & DISCUSSION

4.1 Findings

Table 1 presented selected demographic characteristics of the respondents. These include gender, job experience and level of education.

Table 1

Demographic Characteristics of Respondents

Category	Frequency	Percent
Gender		
Male	75	61.5%
Female	47	38.5%
Job Experience		
1-5 years	46	37.7%
6-10 years	44	36.1%
11-15 years	20	16.4%
16-20 years	8	6.6%
21 and above	4	3.3%
Level of Education		
Diploma/HND	15	12.3%
BSc	62	50.8%
Postgraduate	45	36.9%
Total	122	100.0%

The result in Table 1 indicates that the majority of respondents (61.5%) are male, while few (38.5%) are female. Majority of the respondents (37.7%) have 1-5 years job experience, with few (3.3%) possessing 21 years and above work experience. Regarding education level, the majority of respondents (50.8%) hold a BSc degree, while few (12.3%) have a diploma or HND.

Table 2

Comparison of Fit Indices between the User Model and the Baseline Model

Fit Index	User Model	Baseline Model	Robust User Model
Comparative Fit Index (CFI)	0.984	0.985	–
Tucker-Lewis Index (TLI)	0.958	0.959	–
Robust Comparative Fit Index (CFI)	–	–	0.998
Robust Tucker-Lewis Index (TLI)	–	–	–

The Comparative Fit Index (CFI = 0.984–0.985) and the Tucker-Lewis Index (TLI = 0.958–0.959) both reveal that the model fits the data perfectly. Both scores are higher than the standard 0.95, which means the model fits perfectly. The robust CFI (0.998) and robust TLI (0.973) numbers indicate that the model works very well, even when non-

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normality or other changes are taken into account. The results indicate that the user model performs better than the baseline model and explains most of the variation in the data.

Table 3

Loglikelihood and Information Criteria

	Value 1	**Value 2**
Loglikelihood User Model (H0)	-2828.269	-2828.269
Scaling Correction Factor (MLR) for H0	1.628	—
Loglikelihood Unrestricted Model (H1)	-2461.691	-2461.691
Scaling Correction Factor (MLR) for H1	1.261	—
Akaike Information Criterion (AIC)	5762.537	5762.537
Bayesian Information Criterion (BIC)	5911.15	5911.15
Sample size Adjusted BIC (SABIC)	5743.575	5743.575

Log-likelihood values indicate how well the model accounts for the data. The user model (H_0) has a loglikelihood of -2828.269; the unrestricted model (H_1) has a loglikelihood of -2461.691, suggesting that the unrestricted model (which includes more freely determined parameters) better fits the data. Particularly under the Maximum Likelihood Robust (MLR) estimate approach, which considers non-normality and heteroskedasticity in the data, the scaling correction factors (1.628 for H_0 and 1.261 for H_1) compensate for departures from normality.

Table 4

Root Mean Square Error of Approximation (RMSEA)

Statistic	**Value 1**	**Value 2**
RMSEA	0.027	0.012
P value for H_0: RMSEA $\leq$ 0.050	0	0
P value for H_0: RMSEA $\geq$ 0.080	0	0

Root Mean Square Error of Approximation (RMSEA) of 0.027, and 0.012 are also indicative of good model fit since these values are much less than the generally accepted standard of -0.05 as an adequate model fit. The p -values of H 0: RMSEA = 0.050 =0.000, which means that the null hypothesis of close fit is statistically acceptable. In addition, p-values on H 0 RMSEA =0.080 or more are 0.000, which supports the lack of evidence on the inappropriateness of fit.

Table 5

Measurement Model: Latent Variables and Indicator Loadings

Latent Variable	**Indicator**	**Estimate**	**Std. Err**	**z value**	**P value**	**Std. lv**
E Procurement	EP1	1	—	—	—	0.619
	EP2	1.115	0.122	9.169	0	0.69
	EP3	1.064	0.122	8.723	0	0.658
	EP4	1.289	0.156	8.274	0	0.798
	EP5	1.235	0.147	8.377	0	0.765
	EP6	1.134	0.142	7.996	0	0.702
	EP7	0.991	0.157	6.297	0	0.613
Technological Capability	TC1	1	—	—	—	0.78
	TC2	1.101	0.086	12.761	0	0.859
	TC3	1.08	0.107	10.063	0	0.842
	TC4	0.889	0.127	7.013	0	0.693
Innovation	I1	1	—	—	—	0.827
	I2	0.858	0.082	10.458	0	0.71
	I3	0.763	0.092	8.277	0	0.631
	I4	0.964	0.054	17.691	0	0.797
Organizational Performance	OP1	1	—	—	—	0.716
	OP2	0.997	0.073	13.656	0	0.714
	OP3	0.734	0.1	7.346	0	0.526
	OP4	0.969	0.148	6.527	0	0.694
	OP5	0.867	0.225	3.86	0	0.621
	OP6	0.733	0.198	3.703	0	0.525
	OP7	0.902	0.144	6.271	0	0.646
	OP8	0.949	0.222	4.266	0	0.68

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Table 5 shows the estimates of the factor loading, standard error, z-, p-, and standardised loading (Std.lv) of the latent factors of the model. The factor loadings (p -values= 0.000) of all indicator (EP1 to EP7) in the E-Procurement latent variable are strong, where the standardised loading ranges between 0.613 and 0.798, and this means that these items are related closely to the latent variable. EP4 is the most standardised loading (0.798), indicating that it is the most effective indicator of the factor of E-Procurement. On the other hand, EP7 is least related with the latent variable (0.613), although it is significant. All indicators (TC1 to TC4) of the technological capability latent variable are statistically significant (p -values = 0.000). The standardised loadings fall between 0.693 and 0.859, with TC2 (0.859) having the greatest relationship with technological capacity. The correlation with TC4 is the least strong 0.693, but it still shows a moderate correlation with the hidden variable. Indicators have strong factor loadings in the innovation latent variable with standardised loadings ranging between 0.631 and 0.797. The greatest standardised loading is to I4 (0.797), which means that it is the most important measure of innovation, but I3 (0.631) has the weakest though significant relationship with the latent variable. The standardised loadings of the indicators of organisational performance (OP1 to OP8) are between 0.525 and 0.716 indicating a moderate fit to the organisational performance factor. The highest loading is of OP1 (0.716), and lowest of OP3 (0.526), but they are all statistically significant.

Table 6

Regression Results

Dependent Variable	Predictor	Estimate	Std. Err	z value	P value	Std. lv
Organizational Performance	E_Prcrmnt (c1)	0.508	0.193	2.631	0.009	0.439
	Tchnlgc_C (c2)	0.129	0.156	0.825	0.41	0.14
	Intrctn_T (c3)	-0.033	0.04	-0.821	0.412	-0.046
Innovation	E_Prcrmnt (a1)	0.222	0.128	1.734	0.083	0.166
	Tchnlgc_C (a2)	0.8	0.12	6.666	0	0.754
Organizational Performance	Innovation (b1)	0.191	0.145	1.318	0.188	0.22

The regression results show the links between the latent variables. With a standardized estimate of 0.439 (p = 0.009), e-procurement (c1) significantly improves organizational performance by implying that enhancements in e-procurement are linked to greater organizational performance. With little standardized estimates of 0.140 and -0.046, technological capability (c2) and interaction technology (c3) do not much forecast organizational performance (p = 0.410 and p = 0.412, respectively). While technological capability (a2) strongly predicts innovation with a highly significant positive effect (p = 0.000) and a standardized estimate of 0.754, e-procurement (a1) has a marginally significant positive effect (p = 0.083) with a standardized estimate of 0.166. With a low standardized estimate of 0.220, innovation (b1) does not much forecast organizational performance (p = 0.188). The findings suggest that e-procurement and technical capability are major factors affecting organizational success, with technological capability being especially important for innovation.

Table 7

Covariances

Variable 1	Variable 2	Estimate	Std. Err	z value	P value	Std. lv	Std. all
E Procurement	Technological Capability	0.325	0.094	3.446	0.001	0.674	0.674

The relationship between E-Procurement and Technological Capability is 0.325, with a standardized estimate of 0.674, indicating a strong positive link between these two factors. The z-value of 3.446 and the p-value of 0.001 indicate that this covariance is statistically significant, implying that an increase in E-Procurement correlates with an increase in Technological Capability.

Table 7

Variances

Variable	Estimate	Std.Err	z-value	P-value	Std.lv	Std.all
EP1	0.461	0.085	5.397	0	0.461	0.546
EP2	0.278	0.067	4.126	0	0.278	0.368
EP3	0.169	0.041	4.097	0	0.169	0.28
EP4	0.266	0.047	5.696	0	0.266	0.295
EP5	0.31	0.066	4.714	0	0.31	0.347
EP6	0.335	0.075	4.474	0	0.335	0.405
EP7	0.309	0.067	4.592	0	0.309	0.451
TC1	0.347	0.091	3.836	0	0.347	0.364

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TC2	0.236	0.076	3.117	0.002	0.236	0.242
TC3	0.155	0.045	3.434	0.001	0.155	0.179
TC4	0.346	0.086	4.02	0	0.346	0.419
I1	0.144	0.034	4.211	0	0.144	0.173
I2	0.225	0.065	3.481	0	0.225	0.309
I3	0.227	0.062	3.659	0	0.227	0.363
I4	0.332	0.077	4.319	0	0.332	0.343
OP1	0.746	0.166	4.491	0	0.746	0.592
OP2	0.62	0.175	3.548	0	0.62	0.549
OP3	0.411	0.101	4.047	0	0.411	0.598
OP4	0.454	0.104	4.356	0	0.454	0.485
OP5	0.343	0.11	3.107	0.002	0.343	0.471
OP6	0.294	0.065	4.509	0	0.294	0.516
OP7	0.653	0.101	6.459	0	0.653	0.61
OP8	0.305	0.084	3.626	0	0.305	0.398
E-Procurement	0.383	0.113	3.379	0.001	1	1
Tchnlgcl-Cpblt	0.608	0.145	4.181	0	1	1
Innovation	0.16	0.056	2.841	0.005	0.235	0.235
Orgnztnl_Prfrm	0.24	0.084	2.867	0.004	0.468	0.468

Table 7 shows the differences for the indicators of the hidden variables, all of which are statistically significant (p-values < 0.005), indicating strong connections between the indicators and their related hidden variables. The variances for E-Procurement (EP1 to EP7) range from 0.169 for EP3 to 0.461 for EP1, while the normalized variances span from 0.280 to 0.546. This indicates that EP1 exhibits the greatest volatility, hence contributing most substantially to the variation in the E-Procurement latent variable, whereas EP3 contributes the least, albeit still significantly. The indicators for technological capability (TC1 to TC4) exhibit considerable variances, with TC4 presenting the highest standardized variance of 0.419 and TC3 the lowest at 0.179, signifying a marginally weaker yet still significant contribution to the technological capability component.

In the context of innovation, the variances for indicators I1 to I4 are all statistically significant, with I4 exhibiting the largest standardized variance (0.343) and I1 the lowest (0.173), indicating that I4 is the most impactful in expressing the innovation latent variable. The organizational performance indicators (OP1 to OP8) exhibit notable differences, with OP1 displaying the highest standardized variance (0.592) and OP8 the lowest (0.398). The differences in the hidden factors are significant, with E-Procurement and Technological Capability showing variances of 0.383 and 0.608, respectively, both having normalized variances of 1.000, which means they are very important in the model.

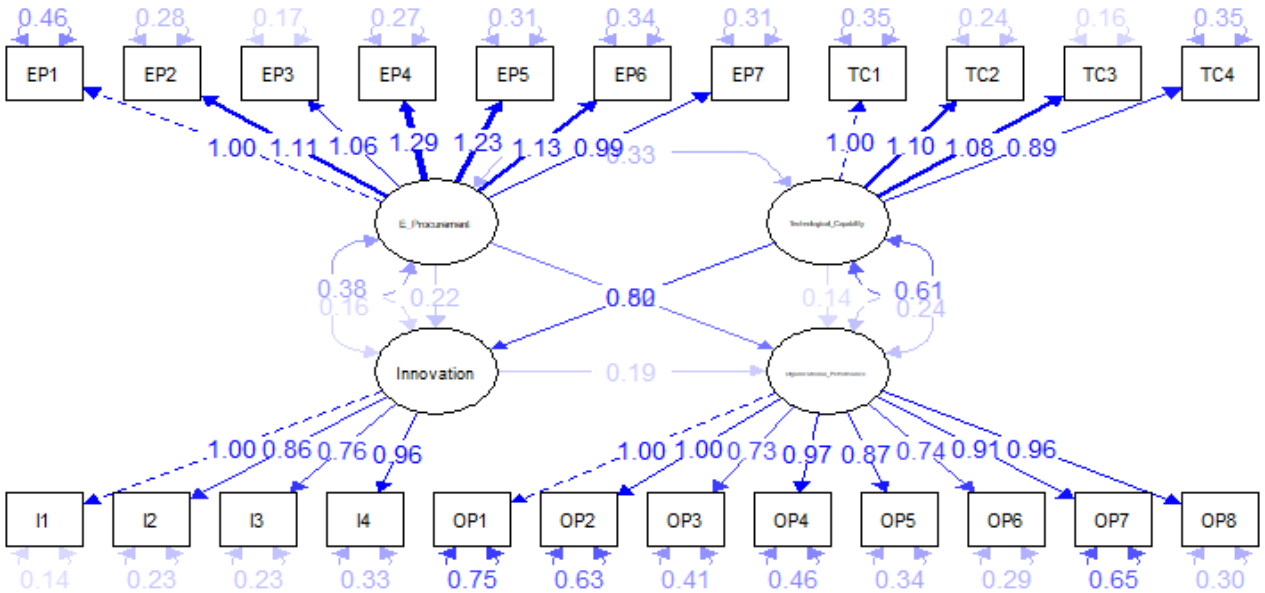

Figure 1

Structural Equation Model (SEM) Showing the Interrelations between E-Procurement Practices, Technological Capability, Innovation, and Organizational Performance

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Figure 1 represents the Structural Equation Model (SEM) which is a graphical representation of delineations of the interrelations between e-procurement practices, technological capability, innovation, and organizational performance using both latent constructs and observed indicators. The path coefficients indicate that technological capability (0.61) has stronger impact on innovation than e-procurement practices (0.38), which means that companies with better technological capabilities are more likely to develop innovative activity. All these coefficients, also indicate that technological capability (0.61) has more significant influence on innovation, when compared to e-procurement practices (0.38) and this implies that firms with high levels of technological capability are better placed to foster innovation. The direct effect of technological capability on organizational performance is small (0.14), which means that innovation plays a major mediating role in its effect on performance. Moreover, the model proves that innovation has the strongest direct effect on the organizational performance (0.80) which underlines its central role in improving the business outcomes. Most of the variables observed are associated with high factor loading indicating strong reliability in the measurement of the underlying constructs. The implication of this observation is that e-procurement is more likely to increase the operational efficiencies compared to the innovation and performance improvements made upon advances in technology.

4.2 Discussion

The results support the main ideas expressed in the literature that remain, especially the special role of technological capability in driving innovation and organizational performance. The importance of technological and IT capabilities to enhance organizational success, particularly when combined with the procurement and innovation processes, was highlighted in the prior studies. Studies by Lestari and Ardianti (2019), Wu et al. (2020), and Melián-Alzola et al. (2020) highlight that being able to capitalize on the use of technology is important to become more agile and perform better. This suggestion is also confirmed in the current study, which shows that the technological capability (0.61) is more influential in innovation than e-procurement practices (0.38). This is in line with the claims in the literature that the integration of technology is indispensable in enhancing the performance of procurements and the general agility of the organization at large. In both the literature and this study, technology has been depicted as a pivotal force of success, especially in enhancing operational effectiveness, supply-chain, and competitiveness in various industries. However, this research paper provides a more nuanced approach by showing that the direct effect of technological capability on the performance of organizations is quite low (0.14) and is mostly mediated by innovation.

This observation differs with the general statements in the literature, where the impact of technological integration is often described as having a direct positive impact on performance in different industries, such as NGOs, textiles, and SMBs. To give an example, Daniel and Ngugi (2018), and Oteki (2019) suggest that e-procurements practices are conducive to performance because of efficiency, cost-reduction, and service delivery. These current path coefficient values have highlighted the fact that although e-procurement practices are regarded as a source of innovation, their performance implications are not as strong as technological capabilities, hence e-procurement though it is enhancing organizational performance through operational improvements, is not as effective as technological changes in directly influencing organizational performance. This study comes to the conclusion that the e-procurement practices and technological capability are helpful in the innovation, but the technological capability plays a more dominant role.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This work provides three important contributions to the literature on supply-chain and procurement: Mediated Role of Innovation: We do not follow the traditional assumption that technological capability has a direct positive influence on organizational performance by showing that it is rather an indirect influence that happens via innovation. This observation builds on the Dynamic Capabilities Theory by bringing in innovation as an essential mediating variable. Theory Extension in Context: This research expands the scope of the Dynamic Capabilities Theory by applying it, not only to organisations in the private or developed-country settings, but also to the context of a developing country, specifically the public-sector organisations. This institutional in terms of geography contextualization enhances the theoretical discussion on the functioning of capabilities within an environment of resource and regulatory constraints.

E-procurement as an Enabler: Instead of viewing e-procurement as a mere technical instrument, our results place it as a component of a more general organisational resource that engages with technological resources to determine the results of innovation. This reconceptualisation welcomes more integrated perspective of the role played by digital tools in development of dynamic capability. We argue that the study is a solid basis of future research on the theoretical process by which digital transformation takes place in procurement systems because recent empirical research has raised the issue of foregrounding theory as the foundation of empirical studies.

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5.2 Recommendations

Stakeholders should prioritize building dynamic capabilities that facilitate continuous sensing and seizing of opportunities, especially by fostering innovation through investments in technological infrastructure and organizational routines. Promote a culture that nurtures entrepreneurship and iterative learning within public organizations to strengthen their capacity for transformation and resilience in the face of crises and resource constraints. It is recommended that policy makers should come up with policies that enable the public-sector agencies to develop their routines of sensing, shaping and connecting-focal components of dynamic capabilities. Policy makers must come up with structures that can motivate innovations activities and digital transformation programs in the governmental institutions, thus creating path breaking innovations and resilience in the government.

REFERENCES

Ahmad, N., Mad Lazim, H., Shamsuddin, A., Wahab, E., & Abu Seman, N. A. (2019). The relationship between technological capability and manufacturing performance. *International Journal of Supply Chain Management, 8*(2), 930–938.

Cornelissen, J. P., Durand, R., Fiss, P. C., Lammers, J. C., & Vaara, E. (2024). Putting theory front and center in supply chain management. *Journal of Supply Chain Management, 60*(2), 3–12. https://doi.org/10.1111/jscm.12328

Daniel, M., & Ngugi, D. K. P. (2018). Influence of e-procurement on performance of commercial state corporations in Kenya. *International Journal of Social Sciences Management and Entrepreneurship, 1*(1), 26–38.

Demeter, G., Delina, R., Urminsky, J., & Zajarosova, M. (2025). Assessing the impact of supplier group stability on public procurement performance in Slovakia: A causal forest analysis of collusion signals. *IEEE Access, 13*, 41607–41624. https://doi.org/10.1109/ACCESS.2025.3547688

Figueiredo, P. N. (2016). Evolution of the short-fiber technological trajectory in Brazil's pulp and paper industry: The role of firm-level innovative capability-building and indigenous institutions. *Forest Policy and Economics, 64*, 1–14. https://doi.org/10.1016/j.forpol.2015.12.008

Harland, C., Knight, L., & Zheng, J. (2021). Digital procurement and supply management: Pandemic learnings and future directions. *Journal of Purchasing and Supply Management, 27*(3), 100701. https://doi.org/10.1016/j.pursup.2021.100701

Ibem, E. O., Aduwo, E. B., Tunji-Olayeni, P., Ayo-Vaughan, E. A., & Uwakonye, U. O. (2016). Factors influencing e-procurement adoption in the Nigerian building industry. *Construction Economics and Building, 16*(4), 54–67. https://doi.org/10.5130/AJCEB.v16i4.4984

Kshetri, N., & Voas, J. (2022). Blockchain-enabled procurement systems: Architecture, applications, and future directions. *IEEE IT Professional, 24*(2), 68–75. https://doi.org/10.1109/MITP.2022.3146393

Lestari, E. R., & Ardianti, F. L. (2019). Technological capability and business success: The mediating role of innovation. In *IOP Conference Series: Earth and Environmental Science* (Vol. 250, p. 012039). IOP Publishing. https://doi.org/10.1088/1755-1315/250/1/012039

Melián-Alzola, L., Fernández-Monroy, M., & Hidalgo-Peñate, M. (2020). Information technology capability and organisational agility: A study in the Canary Islands hotel industry. *Tourism Management Perspectives, 33*, 100606. https://doi.org/10.1016/j.tmp.2019.100606

Oteki, E. B. (2019). Influence of electronic procurement practices on supply chain performance of sugar processing firms in Kenya (Doctoral dissertation, Jomo Kenyatta University of Agriculture and Technology, College of Human Resource Development).

Otiso, K. N. (2017). Assessing the effect of technological capabilities on firm performance: Case study of Nzoia Sugar Company. *European Journal of Management and Marketing Studies, 2*(2), 191–208.

Pflueger, D., Anupindi, R., Bell, J. E., & Bode, C. (2024). Theorizing supply chains: Using theory as camera and engine. *Journal of Purchasing and Supply Management, 30*(1), 100910. https://doi.org/10.1016/j.pursup.2024.100910

Rouse, E., Wry, T., & Aldrich, H. (2025). A roadmap to relevance: How to make a theoretical contribution. *Academy of Management Journal, 68*(2), 257–266. https://doi.org/10.5465/amj.2025.4002

Runtuk, J. K., Christanto, S., & Ng, P. K. (2025). Optimizing supplier selection: A comparative study of fuzzy VIKOR and fuzzy MOORA for performance-based decision making. *IEEE Access, 13*, 8456–8468.

Sandberg, J., & Alvesson, M. (2021). Meanings of theory: Clarifying theory through typification. *Journal of Management Studies, 58*(2), 487–516. https://doi.org/10.1111/joms.12587

Shaw, N., Caldera, H. T. S., & Greer, D. (2022). Real-time procurement analytics and their impact on supply chain resilience. *International Journal of Operations & Production Management, 42*(5), 651–674. https://doi.org/10.1108/IJOPM-03-2022-0157

Licensed Under Creative Commons Attribution (CC BY-NC)

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Wu, Y., Gu, F., Ji, Y., Guo, J., & Fan, Y. (2020). Technological capability, eco-innovation performance, and cooperative R&D strategy in new energy vehicle industry: Evidence from listed companies in China. *Journal of Cleaner Production*, *261*, 121157. https://doi.org/10.1016/j.jclepro.2020.121157

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Making sense of ability grouping: Understanding the educational rationale and psychological effects of ability grouping in Uganda's secondary schools

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ABSTRACT

The study aimed at exploring the rationale for and psychological effects of ability grouping in secondary schools. It was anchored mainly on the reference group theory. Following a qualitative approach and an explorative and phenomenological design, the study was conducted among 14 participants, that is, head teachers and students who were selected using purposive sampling. Data were analysed using themes and subthemes; hence, thematic analysis. Findings from interviews and focus group discussions reveal that schools adopt ability grouping practices for purposes related to enabling customised instruction, enhancing peer learning, optimising academic potential, improving learning outcomes and managing classrooms. The psychological effects of ability grouping emerged as those related to students' self-esteem, confidence, motivation, engagement, identity, stigma and anxiety. In conclusion, ability grouping must be carefully planned and implemented to avoid its negative effects on learners. It is therefore recommended that schools and stakeholders involved in ability grouping take into account the psychological effects of the practice and adopt strategies that enhance support and self-esteem, reduce stigma, train teachers and consider parents' views and feelings about the practice. Schools must practise flexible grouping, continuous assessment, training and ongoing teacher professional development and monitoring, and equitable distribution of materials and resources.

Keywords: Ability Grouping, Educational Rationale, Psychological Effects, Secondary Schools

I. INTRODUCTION

The educational practice of dividing learners into distinct groups, based on perceived achievement and ability, both within classes (Nomi, 2009; Wilkinson et al., 2016) and between classes (Kususanto et al., 2010; Tan & Dimmock, 2022), either at class or subject level (Wang et al., 2021), has become a trending and widely-practiced strategy, in not only elementary but also high schools in Uganda and beyond. Goals of effective teaching and learning have witnessed student grouping in comparison to mixing them, which has been the norm in recent years. The rationale behind ability grouping as an ability practice is to tailor all forms of instruction to meet the individual learner's unique learning needs, in order to enable them achieve growth and improvement of academic achievement and performance. These end goals are targeted towards both group and individual academic growth. The determination of grouping is primarily based on displayed potential or performance in past assessments. In most scenarios and circumstances, ability groups are usually of small and manageable sizes. The practice can be purposive (Wang et al., 2021) and based on academic achievement (Steenberg et al., 2016) but it must be noted that it has effects of separation and/or polarisation (OECD, 2016) yet it does not guarantee improved grades among students (Slavin, 1990). It further deepens academic disparities and differences, and promotes injustice and inequality (Boaler et al., 2000). What is often underscored is the role of teachers or teacher practices within ability grouping (DeBoer et al., 2010).Therefore, in all forms of ability grouping, teacher support must be appreciated as it is critical in defining how best ability grouping can shape learning and identifying to who the practice might be detrimental.

The original rationale behind the practice of ability grouping was to assist instructors to offer support to learners under their custodianship based on their cognitive differences (Okello, 2019). It is presumed that learners in

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homogeneous rather than heterogeneous groups benefit from tailored instruction targeting their individual learning needs and aptitudes (Nusser & Gehrer, 2020; Good et al., 1984) hence appropriate assistance and support. As much as the rationale is positive, its potential effects on learners within and beyond the classroom and academic boundaries cannot be ignored (Ambreen, 2017; Marks, 2014). Ability grouping is aimed at reducing heterogeneity. Many countries, both in the developed and developing world, practice ability grouping in their schools, where high performers are assigned to higher tracks (Wang et al., 2021) and who stand a high chance of joining university (De Boer et al., 2010).

Ability grouping comes in two basic forms, that is, within-class and between-class grouping. The former, as argued by Macintyre and Ireson (2002) is a method of grouping students that targets a reduction in heterogeneity and enables attainment through the avoidance of emotional and social shortfalls of streaming (Gregory, 1984). The latter on the other hand, that is between class grouping, is the method or ability practice where different classes within the same school are assigned to different streams or tracks (Tan & Dimmock, 2022) for all the diverse subjects (Chmielewski, et al., 2013). Other terms used to mean and describe ability grouping include cognitive based classroom streaming (Okello, 2019), tracking (George, 1988, 1993; Oakes, 1983), homogenous grouping (Esposito, 1973; Heltemes, 2008; McGaughy, 1930), streaming (Mansor et al., 2016) and differentiated instruction (Kotob & Abadi, 2019; Tieso, 2003).

The study was informed mainly by the reference group theory by Hyman (1942) which has its roots and foundations in the social sciences. According to Hyman, students placed in diverse ability groups are influenced by norms and behaviours of that particular group, which in turn affects their learning and academic performance. The students are expected to adopt values and attitudes of the groups where they have been placed, which leads to both appetitive and non-appetitive outcomes on both self-concept and achievement. Hence, the study sought to explore the rationale for and effects of ability grouping, in order to unearth the best practices, if the positive outcomes are to be realised.

1.1 Statement of the Problem

Ability grouping has become a widely used instructional practice with an end goal of facilitating teacher effectiveness and learner academic achievement. In the Ugandan context, the actual and evidence-based rationale is still under explored. Morestill, studies focusing on its psychological effects on learners remain scanty. Hence an existent knowledge gap on its rationale and psychological effects. Whereas ability grouping may have positive objectives behind them, its aversive effects on learners cannot be ignored and these effects come in diverse forms such as those on students' psychological well-being in the areas of self-esteem, self-efficacy (Hendricks, 2009), motivation (Saleh et al., 2007), engagement (Kurian, 2019) and possible school dropout (Van Houtee & Demanet, 2016), self-concept (Adeloduni, 2021; Belfi et al., 2012), attitudes towards studying (Vogl & Preckel, 2014) and emotional growth if not well intentioned during planning and initiation, and well-regulated during implementation. The effects of ability grouping are not only academic but also psychological and social in nature. If these key aspects of ability grouping go on without inquiry such as this research, schools may continue to implement the practice using strategies that negatively affect learners unintentionally. Therefore, this study aims at investigating the educational rationale and psychological effects of ability grouping on secondary school learners in Uganda in order to inform instructional decisions that support learners and learning in general.

1.2 Research Objectives

i. To investigate the rationale for ability grouping in Uganda's secondary schools.
ii. To explore the psychological effects of ability grouping on secondary school learners.

1.3 Research Questions

i. What is the rationale for ability grouping in Uganda's secondary schools?
ii. What are the psychological effects of ability grouping on secondary school learners?

II. LITERATURE REVIEW

2.1 Theoretical Review

Theoretically, the study was informed by theories such as the reference group (Halliman et al., 2003; Hyman, 1942; Ireson & Hallam, 1999; Richer, 1976), social cultural (Tzuriel, 2021; Verenikina, 2003; Vygotsky, 1981), social learning (Bandura & Walters, 1977), cognitive development (Huitt & Hummel, 2003; Piaget, 1990) and self-determination theories (Bourgeois & Boberg, 2016; Deci & Ryan, 2012). Collectively, these theories advocate for mixed ability grouping practices such as scaffolding (Do & Carey, 2016; Hunter, 2007) against homogeneous practices that limit student interactions and collaborations (Hallinan et al., 2003; Jones & Gerig, 1994; Saleh et al., 2007), through which they can learn from each other. On the other hand, ability grouping helps in tailoring and aligning teaching to learners' levels of development (Hallinan et al., 2003). As an ability practice, ability grouping affects learner motivation

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both positively and negatively (Chessor, 2014; Williams, 1972) and this is dependent upon the effects on learners' level of academic competence.

2.2 Empirical Review

Ability grouping has been practiced in schools for several reasons, such as, to achieve individualised instruction (Slavin, 1990). It is meant to differentiate the subject curriculum and make it easier, and the student to adapt to the strategies of teaching in order to meet both individual and group needs (Jordan, 1965; Slavin, 1990). Also, ability grouping targets resolving challenges related to low attention span (Felmlee & Eder, 1983), idleness and cognitive laziness that are associated with heterogeneous groups that include students of all diverse cognitive potential. Because heterogeneous groups make learners develop a false sense of superiority due to lack of challenges, the reverse is true under homogeneous grouping (Fiedler et al., 2002). The other rationale is aimed at promoting healthy competition among slow learners (Hwang, 2013). In mixed groups, the gifted students are overwhelmed by being subjected to the role of stimulating the average and slow learners, but this is resolved under ability grouping where they are given the instructional attention they deserve (Felmlee & Eder, 1983). Ability grouping is also aimed at enabling friendships and interpersonal relationships to happen only outside the classroom environment (Kutnick et al., 2005).

In terms of effects, ability grouping has both academic and non-academic outcomes. Academically, the ability practice has both positive and negative outcomes and is more beneficial to the gifted students when they receive tailored instruction in separate tracks (Kulik & Kulik, 1984) specifically in secondary schools, while its effects are detrimental on moderate and low performing students. Therefore, ability groups benefit high ability students at the expense of their low-ability counter-parts, and hence, this shortfall must be illuminated (Gamoran et al., 1995). The achievements are in terms of student participation especially among honours' students. Among secondary school students, ability grouping affects academic achievement (Slavin, 1990) and learning (Halliman, 2000) because ideally, the practice is expected to maximise achievement among learners as a goal, and again, this benefits the students who are assigned to higher ability tracks, because they stand to benefit from instruction that is of high quality. However, lower track students receive the opposite.

It is also noted that ability grouping has instructional and institutional effects since teaching is differentiated between the existent groups and affects content coverage. The institutional effects have a lot to do with resource allocation (Betts & Shkolnik, 2000). This also has effects on student motivation as they are driven to study harder in order to maintain or attain high status tracks. However, the effect of ability grouping on academic achievement has not been found to be statistically significant (Goldberg, 1966). High ability students continue to perform better while low ability students' performance continues to worsen (Betts & Shkolnik, 2000). Academic self-efficacy too as a cross cutting attribute between academics and psychological self-concept, has been affected by ability grouping (Cheung & Rudowicz, 2003). Psychologically, ability grouping has caused dynamics in students' self-concept at different degrees (Ireson et al., 2001).

This also affects learners' self-esteem and ultimately influences their attitude towards school work and school in general (Gamoran & Berends, 1987). Still on self-concept and self-esteem, more researchers continue to assert that these psychological aspects are affected by ability practices such as homogeneous grouping (Gross & Smith, 2021; Kususanto et al., 2010; Maurer, 2020). Another psychological attribute affected by ability grouping is student motivation (Chessor, 2014) and socialisation and social relationship (Okello, 2019; Vogl & Preckel, 2014) because it affects how learners across the different tracks interact partly due to self-inflicted and social stigma that emanates from ability grouping (Baker, 2018; Ireson & Hallam, 2001; McManus, 2010). It is because of these effects that the researchers set out to investigate the rationale for and the lived effects, as bases for the formulation of the best practices that can assist educators reap the intended benefits of ability grouping as an ability practice.

III. METHODOLOGY

In this study, we utilised a qualitative and an exploratory (Stevens & Wrenn, 2013) phenomenological (Bliss, 2016; Englander, 2016) approach and design respectively, to investigate the rationale and effects of ability grouping in secondary schools in Uganda. The design was preferred because of its ability to enable the researcher to submit detailed and defendable explanations of the phenomenon under investigation (Klenke, 2016). The target population were school administrators for the rationale for ability grouping and students for the effects of the practice. The sample size was 14, that is, two school administrators (A1 and A2) and 12 students (S1-S12). Data were collected using both interviews (Alshenqeeti, 2014) for the administrators and focus group discussions for the students. The administrators and students were selected purposively as policy makers and implementers, and recipients respectively. In the same vein, administrators and students from schools where ability grouping is not practiced were excluded from the study (Ahmad & Wilkins, 2025). Data was recorded with a phone recorder, transcribed, and themes generated. The same themes guided the thematic content analysis (Humble & Mozelius, 2022; Neuendorf, 2018). Data analysis and discussion were conducted concurrently.

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IV. FINDINGS & DISCUSSION

4.1 Rationale for Ability Grouping

According to the school administrators who were subjected to in-depth interviews, the justifications and rationale for the implementation of ability grouping turned out to be academic and educational in nature as described under the following themes.

4.1.1 Customising Instruction

From the interviews, it emerged that schools practice ability grouping in order to reap the benefits of tailored instruction, targeting the unique and individual learning needs of the learners placed in the homogenous groups. This customisation revolves around teaching strategies, content knowledge and pace, as one head teacher expressed,

> *You see, as much as many parents don't like this practice, us the ones that set learning goals for our learners know very well that if each student, in their own individual academic potential, is to benefit from teaching, they need to be placed with students of similar capacity so that the teacher knows how much effort, which method and at what speed he or she is to teach when teaching a specific class. This is the main reason why we divide these students into these learning units, so the goal is positive, with no negative outcomes in mind* (Participant A1, female)

This was also re-echoed by a school administrator from another school who argued that customised instruction as a goal of ability grouping is aimed at helping students have their unique academic needs catered for,

> *We aim at teachers making an effort to match their teaching and instruction to the learners' level of aptitude and understanding, and also hope that these same teachers practice a teaching pace that is relative whereby we expect them to teach faster the students in upper streams and slower to the mediocre and low achievement students. The problem is not the practice itself since the goals are pro-students but the way it is implemented and if the goals are adhered to all through the learners' educational and academic journey* (Participant A2, male).

Therefore, at the forefront of ability grouping as an ability practice in secondary schools, school administrators have genuine goals to offer learners instruction that is tailored to their level of understanding, application and memorisation of content knowledge taught to them, for the end goal of achieving to the best of their ability in their stratified groups. These findings concur with those conducted by Slavin (1990) whose systematic reviews tackle and discuss differentiated instruction as a goal of ability grouping, and Park and Datnow (2017) who confirm that ability grouping is geared towards differentiated instruction and its benefits. In the same vein, Fogarty (2004) further confirm the tailored instruction goals of ability grouping.

4.1.2 Improving Learning Outcomes

Secondly, it was argued, by the school administrators that one major rationale behind ability grouping in schools is to enable improvement in grades at whatever level and in whichever stream, as one asserted,

> *We must appreciate that at the end of the day, every learner should be growing and improving in their academic grades and if this is to be achieved, then ability grouping comes in handy. The weak, average and high achievers are expected to benefit from ability grouping through the improvement of their grades, which is the ultimate expected outcome at the end of the academic calendar. When learners are placed together with their academic peers, it is hoped that they learn faster and improve on their previous performance* (Participant A2, male).

When asked to elaborate on how this hope for improved performance outcomes is possible, the same head teacher argued,

> *This hope and trajectory comes in several ways, we as administrators and school owners project that because of ability grouping, instruction and teaching will be aligned with students' knowledge and skills' standing, teaching will be paced, support will be offered to students based on their needs, engagement will be enhanced and peer teaching and learning will be enabled. Truthfully, if the implementation of ability grouping is done properly, the learning environment and subsequent learning outcomes will be more responsive and the academic growth of the learners will happen, without a doubt* (Participant A2, male).

This argument is suggestive of a positive rationale but this is stringent upon good practices of ability grouping because the reverse could have the potential of deepening and widening of the learning outcome and achievement gaps if students in high performance tracks or streams receive more attention than their counterparts in the low achieving streams. These studies concur with those done by Hallinan et al. (2003) and Kiss (2017) who relate ability grouping goals to academic achievement and academic performance as intended outcomes of the practice.

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4.1.3 Maximising Potential

From the interviews with school administrators, it also emerged that one other goal of ability grouping is to enable learners of different academic aptitudes be able to maximise their academic ability, as one argued,

> *When we embark on ability grouping between classes, we hope to enable learners maximise their academic abilities and potentials by providing scenarios for enrichment and improvement, maximise how time available for each group is efficiently utilised, motivate learners, improve their self-esteem, offer individualised support for students that are slow, and offer those in higher streams challenges that align with their ability without delaying their progress unnecessarily, through providing them with academic challenges that are group-appropriate* (Participant A1, female).

This was also submitted by the second school administrator who argued,

> *What this practice does is treat each student according to their category, which is hard to achieve if they are bundled up together in one stream. The week students will receive attention and be saved from unnecessary and stressful competition from their more clever classmates.* (Participant A2, male).

This is in agreement with previous studies conducted by Hallinan et al. (2003) who emphasise learning potential maximisation as a goal of ability grouping in schools. Ireson and Hallam (2009) also view ability grouping as a push towards the desire by schools and practitioners to achieve the highest possible level of attainment among students

4.1.4 Reinforcing Peer Learning

It emerged too that ability grouping in schools is geared towards creating and enhancing peer collaborations among learners in academic tasks, as one school administrator asserted,

> *The comfort and safe feeling students feel when grouped according to their different abilities is what we aim at. When they are mixed up, the weak students may not feel confident enough to collaborate and become active participants in the learning process. But we always hope that when they are separated, then this fear will be arrested. It is hoped that this may be achieved through ways that only ability grouping can offer, for example, enabling participation through questions, classmates tutoring their counterparts, joint problem or task-solving, explanation of concepts that can easily be grasped, and facilitating collaborative learning through discussions.* (A1, female).

Hence, the goal is peer learning through collaboration, common goals' sharing, understanding, leadership and participation. Such sentiments in favour of ability grouping are also in line with studies conducted by Hallinan et al. (2003) who assert that students are hoped to find and work within academic peer groups, while Degeng (2017) asserts that this intended benefit of ability grouping aims at achieving collaborative learning. Also, Mills and Durden (1992) refers to this goal as co-operative learning while Agrawal et al. (2017) refer to this rationale as peer learning.

4.1.5 Enabling Classroom Management

Last but not least, the school administrators pointed out classroom management as one of the rationales of ability grouping, as one asserted,

> *Because similar students are placed in one stream, they will be easy to plan for and manage*. (A2, male).

This was further elaborated upon by the other administrator who had a more detailed argument for classroom management as a goal of ability grouping,

> *Teachers can, with ease, plan prospective lessons that are geared towards each student category's needs. Additionally, they can pay attention to the learners' individual learning needs and existent changes within groups. Academic and behavioural changes can easily be monitored and forwarded to administration, and time is effectively put to use since learners in specific groups learn at a relatively similar speed.* (A1, female).

These reasons match those presented by Tan and Dimmock (2022) who argue that ability grouping is aimed at resolving challenges associated with classroom management and control, while Tieso (2003) relates this rationale with classroom management of student behaviour. Last but not least, Blachford and Russel (2019), in their study on class size, grouping practices and classroom management highlight the importance of the practice on the attribute.

Therefore, in summary, from the submission from school administrators, who are the primary advocators for ability practices such as ability grouping, the arguments for the practice range from the desire to customise instruction to encouraging peer learning, maximising learner potential, enabling classroom management and, last but not least, improving learning outcomes.

4.2 Psychological Effects of Ability Grouping

According to the students that are subjected to ability grouping, the practice affects them both positively and negatively psychologically. Firstly, the positive psychological effects include ***increase in confidence*** especially among students placed in the upper tracks as one respondent confessed,

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> *Ever since I was assigned to senior three north, I feel proud of myself for having achieved this placement. When I was in stream east last year in senior two. I did not feel confident enough to even interact with those that were in the north stream. I now know I am capable of excelling and what gives me confidence is seeing myself in the same stream as the brightest of them all. I can now walk on the school compound with my head high, and I am not ashamed of declaring which stream I belong to* (S2, Upper, male).

However, the reverse was reported from students in the lower track, that ability grouping has negatively affected their confidence, as one student admitted,

> *Hmmm, I don't like this at all at all. Because of ability grouping, I feel inadequate and incapable of ever passing. I feel inadequate.* (S11, Lower, male).

These submissions point to the realisation that irrespective of whether the effects are positive or negative, ability grouping affects students' confidence, self-esteem and academic self-efficacy. These findings are in agreement with those conducted by Gross and Smith (2021) who link ability grouping with students' self-esteem, Maurer (2020) whose study links ability grouping with both self-esteem and confidence, Hendricks (2009) whose study's focus is on the relationship between the ability practice and self-efficacy, and last but not least, Francis et al. (2017) whose focus is on self-confidence and how it is affected by ability grouping.

Secondly, it was also revealed, through the students' focus group discussions, that ability grouping affects *student engagement*, depending on where they are placed. The learners placed in low-performing tracks reported fear to participate in on-going learning activities due to factors related to diminished confidence levels as one male respondent asserted,

> *When I was put in the weakest stream, something happened to my willingness to participate in class. I find it hard to ask questions, I find it hard to answer questions, because already, I feel inadequate hence my questions might be meaningless, and my answers might be weak. So I just keep quiet rather than expose my academic weakness* (S12, Lower, male).

Therefore, academic engagement is one of the attributes affected by ability grouping through increased and decreased participation among upper and lower track students respectively, hence, engagement and disengagement among learners. However, a student in an upper stream expressed the reverse, as she argued,

> *I now, and have always been an active participant in lessons because by virtue of the fact that I am always in the upper streams, I am confident enough to ask teachers questions and respond when teachers and fellow students ask questions, and others get to learn from me. Sometimes I also get to learn from my classmates' answers. So, I am an active student in most classroom activities* (S3, Upper, female).

These findings concur with similar studies conducted by Hallinan et al. (2003) whose study focuses the relationship between ability grouping and academic involvement. On the other hand, according to Jean (2016), ability grouping leads to the development of student engagement in Mathematics. Furthermore, Pinsonneault (2015)'s study focuses on how the ability practice indeed has a relationship with how students participate in the learning process. Also, instructional grouping in English classes promotes academic engagement (Brooks & Thurstone, 2010).

Thirdly, ability grouping has been credited for affecting students' ***peer identity***. Students subjected to the ability practice have argued that the practice has made them develop a sense of belonging in circumstances where they are grouped with fellow students of the same academic achievement potential, as one asserted,

> *When I am put with students that have the same academic performance, I feel like I fit in and belong. I don't have to feel inferior or superior, since we are all equal* (S8, Lower, female).

Therefore, the ability practice can be credited for impacting on learners' identity among peers. This is in line with findings in research inquiries done by McManus (2010) whose study focuses on how ability practice in middle and lower classes affects social identity and peer relationships among learners. Peer identity is also presented as a psychological outcome of ability grouping (McGillicuddy & Devine, 2020) specifically in Mathematics classes (Solomon, 2007), as these psycho-social effects affect academic progress, achievement and performance.

Fourthly, ability grouping has been blamed for causing effects related to ***stigma***. This is a negative effect, which affects not only students but parents too, who are placed and have children placed in the middle and lower streams, as one student confirmed,

> *I have seen my classmates develop a feeling of being judged as weak academically due to this type of classroom streaming. We get labelled as weak and this also affects our parents. My mother keeps saying she gets ashamed to mention the name of my stream, so when she is asked, she whispers so that other parents do not hear and get to know that her son is in a class for weak students. Even when others do not make you feel it, it is as if my stream name is written on my forehead (*S10, Lower, male).

Hence, the resultant stigma out of ability grouping is both social and self-inflicted, that is, psychological in nature. The relationship between ability grouping and stigma has been unmasked by researches done by Ireson and Hallam (2009) who assert that students in lower groups become stigmatised. On the other hand, McGillicuddy and Devine (2020) stress that stigma as a result of shame about being in the lower groups especially in primary schools is

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inevitable. Also, Oakes (1983) argues that stigma out of ability grouping is a result of labels such as "retarded or academically disabled" that are a direct result of ability grouping among weaker students.

Psychologically too, ability grouping affects *motivation*. This is two-way. Students in upper streams may develop false confidence and consequently lose the drive to work harder because of the psychological comfort they acquire due to their placement, as one respondent argued,

> *I have seen very bright students lose morale for working harder because of the satisfaction they get from their placement (*S4, Upper, male).

This, though in a different form, was also echoed by a student from a lower stream,

> *It is a personal choice. Due to type of grouping, you can choose to become more determined to work harder so as to achieve a better stream in future, or the morale can die further due to the lower stream placement. So, as much as bad circumstances such as ability grouping can be disadvantageous and demotivating, myself in such scenarios, I get motivated to do what it takes to ensure that the next year, I get promoted to a stream of higher status. I am that determined* (S9, Lower, female)

The link between ability grouping and motivation has also been investigated by Chessor (2014) whose focus is the effect of ability grouping and motivation among gifted students. These are the category found in the upper streams. Other authors that have researched on the link between the two attributes are Ireson and Hallam (2009) whose focus is specifically on intrinsic motivation. Also, Williams (1972) who interested himself in unearthing if or not ability grouping affects student motivation and drive. Saleh et al. (2007) on the other hand, relates within class ability grouping with learner motivation. In conclusion, from this research and those in the past, it is undeniable that ability grouping has effects on motivation among learners.

Last but not least among the psychological effects of ability grouping, it emerged that the practice is responsible for the emergence of *pressure and anxiety*, irrespective of the stream category, as all the students get anxious about failure to attain higher stream membership. Those in higher streams experience intense pressure to keep within their streams while those in lower streams dedicate all their energy towards promotion to higher streams, as one student asserted,

> *ehhh the pressure is so high, we can't relax at all. Everything becomes geared towards getting to or maintaining higher streams* (S5, Male, Upper).

This was also affirmed by another student who retorted,

> *We are always anxious about which stream we will be posted to. This rules our lives at school and the feeling is not good* (S9, Female, Lower).

The argument that ability grouping leads to anxiety is also supported by studies done by Okello (2019) as far as general anxiety is concerned. However, another more specific anxiety that is a consequence of ability grouping is test anxiety (Chueng & Rudowicz, 2003; Vogelaar et al., 2017).

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Based on the findings, ability grouping is practiced in schools for reasons that revolve around the need to customise teaching, improve pedagogical outcomes, encourage student to student learning, manage and control the classroom or teaching and learning setting and optimise students' academic potential. Psychologically, ability grouping affects learners' self-esteem, academic self-efficacy, confidence, engagement and identity. Other psychological experiences attributed to ability grouping include stigma, motivation and anxiety among students. Some of these effects affect parents too. Therefore, whatever best practices are to be introduced must address these effects, for ability grouping to reap the goals for which it is adopted and implemented.

5.2 Recommendation

We therefore recommend best practices to protect students from the negative effects of ability grouping. These practices may include assessing and evaluating the grouping system regularly so that adjustments can be made based on how students grow and improve. The determinants for placement must be communicated transparently to include academic performance through assessment and teachers' views and input. It would also serve students well if the all groups are accorded relevant support in order to avoid stigmatisation. No group should receive preferential attention and treatment over another. At whatever level or group, students must maintain academic expectations that are high and receive competent and well trained teachers, learning aids and opportunities. Assessment must be continuous and formative in nature to follow up on students' progress and move them to different streams where and when necessary. Teachers must also be monitored to ascertain if they are committed to the original rationale of ability grouping through their pedagogical strategies and participate in activities that enhance professional growth and collaboration. Instructional strategies must be diversified to include both teacher-centred and student-centred teaching styles.

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For ability grouping to be effective, grouping should be a short term and temporary measure, hence a tool for achieving growth and excellence, rather than differentiating learners. Interaction between students in different groups should be reinforced, for example during practical academic activities, in order to promote social interaction across the groups. Psychological effects of ability grouping should be monitored, for example the ones this study unearthed, like, motivation, self-esteem and engagement. Since it emerged that the practice affects both students and parents, the two stakeholders must be involved in grouping criteria and decisions through clear and effective communication of its rationale. The end goal of ability grouping should be academic growth, not generating high and low labels based on ability on students. There is need for educational guidance and counselling of both students and parents to enable them cope with the ever present dynamics within ability grouping.

REFERENCES

Adelodun, G. A. (2021). Mentorship and ability grouping as barometers of socio-cognitive well-being among high ability students in Ibadan, Nigeria. *International Journal of Arts and Social Sciences Education, 6*(1), 1–9.

Adeniran, A. O., & Tayo-Ladega, O. (2024). Critical analysis of phenomenological research design in a qualitative research method. *Management Analytics and Social Insights, 1*(2), 186–196. https://orcid.org/0000-0002-6870-1212

Agrawal, R., Nandanwar, S., & Murty, M. N. (2017). Grouping students for maximizing learning from peers. *International Educational Data Mining Society.*

Ahmad, M., & Wilkins, S. (2025). Purposive sampling in qualitative research: A framework for the entire journey. *Quality & Quantity, 59*(2), 1461–1479. https://doi.org/10.1007/s11135-024-02022-5

Alshenqeeti, H. (2014). Interviewing as a data collection method: A critical review. *English Linguistics Research, 3*(1), 39–45. http://dx.doi.org/10.5430/elr.v3n1p39

Ambreen, S. (2017). Analysing the nature of pupils' interactions in different fixed and mixed ability groups in the primary classroom (Doctoral dissertation, University of Leeds).

Baker, N. (2018). Grouping students by ability: Is there a difference in academic achievement? (Master's dissertation, University of Victoria).

Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1, pp. 141–154). Englewood Cliffs, NJ: Prentice Hall.

Belfi, B., Goos, M., De Fraine, B., & Van Damme, J. (2012). The effect of class composition by gender and ability on secondary school students' school well-being and academic self-concept: A literature review. *Educational Research Review, 7*(1), 62–74. https://doi.org/10.1016/j.edurev.2011.09.002

Betts, J. R., & Shkolnik, J. L. (2000). The effects of ability grouping on student achievement and resource allocation in secondary schools. *Economics of Education Review, 19*(1), 1–15. https://doi.org/10.1016/S0272-7757(98)00044-2

Blatchford, P., & Russell, A. (2019). Class size, grouping practices and classroom management. *International Journal of Educational Research, 96*, 154–163. https://doi.org/10.1016/j.ijer.2018.09.004

Bliss, L. A. (2016). Phenomenological research: Inquiry to understand the meanings of people's experiences. *International Journal of Adult Vocational Education and Technology, 7*(3), 14–26.

Boaler, J., Wiliam, D., & Brown, M. (2000). Students' experiences of ability grouping-disaffection, polarisation and the construction of failure. *British Educational Research Journal, 26*(5), 631–648. https://doi.org/10.1080/713651583

Bourgeois, S. J., & Boberg, J. E. (2016). High-achieving, cognitively disengaged middle level mathematics students: A self-determination theory perspective. *RMLE Online, 39*(9), 1–18. https://doi.org/10.1080/19404476.2016.1236230

Brooks, K., & Thurston, L. P. (2010). English language learner academic engagement and instructional grouping configurations. *American Secondary Education, 39*(1), 45–60.

Chessor, D. (2014). The impact of grouping gifted students on motivation. *The European Journal of Social & Behavioural Sciences, 8*(1), 107–123.

Cheung, C. K., & Rudowicz, E. (2003). Academic outcomes of ability grouping among junior high school students in Hong Kong. *The Journal of Educational Research, 96*(4), 241–254. https://doi.org/10.1080/00220670309598813

Chmielewski, A. K., Dumont, H., & Trautwein, U. (2013). Tracking effects depend on tracking type: An international comparison of students' mathematics self-concept. *American Educational Research Journal, 50*(5), 925–957. https://doi.org/10.3102/0002831213489843

De Boer, H., Bosker, R. J., & van der Werf, M. P. (2010). Sustainability of teacher expectation bias effects on long-term student performance. *Journal of Educational Psychology, 102*(1), 168–179. https://doi.org/10.1037/a0017289

Licensed Under Creative Commons Attribution (CC BY-NC)

Deci, E. L., & Ryan, R. M. (2012). Self-determination theory. In *Handbook of theories of social psychology* (Vol. 1, pp. 416–436).

Degeng, I. N. S. (2017). Effect of ability grouping in reciprocal teaching technique of collaborative learning on individual achievements and social skills. *International Journal of Evaluation and Research in Education, 6*(3), 216–220.

Do, T., & Carey, M. (2016). Ability grouping and scaffolded learning with large classes: Vietnamese students' attitudes to learning approaches. *English Australia Journal, 32*(1), 22–49. https://org/doi/10.3316/informit.424494795429909

Englander, M. (2016). The phenomenological method in qualitative psychology and psychiatry. *International Journal of Qualitative Studies on Health and Well-being, 11*(1), 30682. https://doi.org/10.3402/qhw.v11.30682

Esposito, D. (1973). Homogeneous and heterogeneous ability grouping: Principal findings and implications for evaluating and designing more effective educational environments. *Review of Educational Research, 43*(2), 163–179. https://doi.org/10.3102/00346543043002163

Felmlee, D., & Eder, D. (1983). Contextual effects in the classroom: The impact of ability groups on student attention. *Sociology of Education, 56*(2), 77–87. https://doi.org/10.2307/2112656

Fiedler, E. D., Lange, R. E., & Winebrenner, S. (2002). In search of reality: Unraveling the myths about tracking, ability grouping, and the gifted. *Roeper Review, 24*(3), 108–111. https://doi.org/10.1080/02783190209554142

Fogarty, E. (2004). Tailoring instructional groups: Alterations to fit differentiated reading curriculum. Retrieved from The National Research Center on the Gifted and Talented: http://www.gifted.uconn.edu/nrcgt/newsletter/summer04/sumer043.html

Francis, B., Connolly, P., Archer, L., Hodgen, J., Mazenod, A., Pepper, D., ... & Travers, M. C. (2017). Attainment grouping as self-fulfilling prophesy? A mixed methods exploration of self-confidence and set level among Year 7 students. *International Journal of Educational Research, 86*(8), 96–108. https://doi.org/10.1016/j.ijer.2017.09.001

Gamoran, A., & Berends, M. (1987). The effects of stratification in secondary school: Synthesis of survey and ethnographic research. *Review of Educational Research, 57*, 415–435.

Gamoran, A., Nystrand, M., Berends, M., & LePore, P. C. (1995). An organizational analysis of the effects of ability grouping. *American Educational Research Journal, 32*(4), 687–715. https://doi.org/10.3102/00028312032004687

George, P. S. (1988). Tracking and ability grouping. *Middle School Journal, 20*(1), 21–28. https://doi.org/10.1080/00940771.1988.11494975

George, P. S. (1993). Tracking and ability grouping in the middle school: Ten tentative truths. *Middle School Journal, 24*(4), 17–24. https://doi.org/10.1080/00940771.1993.11495369

Goldberg, M. L. (1966). *The effects of ability grouping*. New York: Teachers College Press.

Good, T. L., Marshall, S., Peterson, P., Wilkinson, L. C., & Hallinan, M. (1984). Do students learn more in heterogeneous or homogeneous groups? New York: Harper & Row.

Gregory, R. P. (1984). Streaming, setting and mixed ability grouping in primary and secondary schools: Some research findings. *Educational Studies, 10*(3), 209–226. https://doi.org/10.1080/0305569840100302

Gross, M. U., & Smith, S. R. (2021). Put them together and see how they learn! Ability grouping and acceleration effects on the self-esteem of academically gifted high school students. In *Handbook of giftedness and talent development in the Asia-Pacific* (pp. 377–403). Singapore: Springer Singapore.

Hallinan, M. T. (2000). Ability group effects on high school learning outcomes. Paper presented at the 95th annual meeting of the American Sociological Association, Washington, DC.

Hallinan, M. T., Bottoms, E., Pallas, A. M., & Palla, A. M. (2003). Ability grouping and student learning. *Brookings Papers on Education Policy, 5*(6), 95–140.

Heltemes, L. (2009). Social and academic advantages and disadvantages of within-class heterogeneous and homogeneous ability grouping, Mathematical and Computing Sciences Masters. Paper 93.

Hendricks, K. B. (2009). The impact of ability-grouping on the achievement, self-efficacy, and classroom perceptions of gifted elementary students (Doctoral dissertation, Walden University).

Huitt, W., & Hummel, J. (2003). Piaget's theory of cognitive development. *Educational Psychology Interactive, 3*(2), 1–5.

Humble, N., & Mozelius, P. (2022, May). Content analysis or thematic analysis: Similarities, differences and applications in qualitative research. In *European Conference on Research Methodology for Business and Management Studies* (Vol. 21, No. 1, pp. 76–81).

Hunter, R. (2007). Scaffolding small group interactions. *Mathematics: Essential Research, Essential Practice, 2*, 430–439.

Licensed Under Creative Commons Attribution (CC BY-NC)

Hwang, Y. J. (2013). Effects of ability grouping on middle school students' affective outcomes. In *Korean Education in Changing Economic and Demographic Contexts* (pp. 127–149). Singapore: Springer Singapore. https://doi.org/10.1007/978-981-4451-27-7_8

Hyman, H. H. (1942). The psychology of status. *Archives of Psychology, 269*, 5–91. Reprint in H. Hyman & E. Singer (Eds.), Readings in reference group theory and research (pp. 147–165). New York: Free Press, London: Collier-Macmillan Limited.

Ireson, J., & Hallam, S. (1999). Raising standards: Is ability grouping the answer? *Oxford Review of Education, 25*(3), 343–358. https://doi.org/10.1080/030549899104026

Ireson, J., & Hallam, S. (2009). Academic self-concepts in adolescence: Relations with achievement and ability grouping in schools. *Learning and Instruction, 19*(3), 201–213. https://doi.org/10.1016/j.learninstruc.2008.04.001

Ireson, J., Hallam, S., & Plewis, I. (2001). Ability grouping in secondary schools: Effects on pupils' self-concepts. *British Journal of Educational Psychology, 71*(2), 315–326. https://doi.org/10.1348/000709901158541

Jean, M. (2016). Can you "work your way up?" Ability grouping and the development of academic engagement (Doctoral dissertation, The University of Chicago).

Jones, M. G., & Gerig, T. M. (1994). Ability grouping and classroom interactions. *The Journal of Classroom Interaction, 29*(2), 27–34.

Jordan, J. W. (1965). Ability grouping: The pros and cons. *Faculty Research Edition of the Savannah State College Bulletin, 19*(2), 32–49.

Kiss, D. (2017). A model about the impact of ability grouping on student achievement. *The BE Journal of Economic Analysis & Policy, 17*(3), 20170036. https://doi.org/10.1515/bejeap-2017-0036

Klenke, K. (2016). Qualitative research as method. In *Qualitative Research in the Study of Leadership* (pp. 31–55). Emerald Group Publishing Limited. https://doi.org/10.1108/978-1-78560-651-920152003

Kotob, M. M., & Abadi, M. A. (2019). The influence of differentiated instruction on academic achievement of students in mixed ability classrooms. *International Linguistics Research, 2*(2), 8. https://doi.org/10.30560/ilr.v2n2p8

Kulik, C. L. C., & Kulik, J. A. (1984). Effects of ability grouping on elementary school pupils: A meta-analysis. Paper presented at the Annual Meeting of the American Psychological Association, Toronto, Ontario, Canada.

Kurian, J. (2019). Differences in student engagement and coping among ability groups (Doctoral dissertation, Goa University).

Kususanto, P., Ismail, H. N., & Jamil, H. (2010). Students' self-esteem and their perception of teacher behavior: A study of between-class ability grouping. *Electronic Journal of Research in Educational Psychology, 8*(2), 707–724.

Kutnick, P., Sebba, J., Blatchford, P., Galton, M., Thorp, J., MacIntyre, H., & Berdondini, L. (2005). The effects of pupil grouping: Literature review. Nottingham: DfES Publications.

Macintyre, H., & Ireson, J. (2002). Within-class ability grouping: Placement of pupils in groups and self-concept. *British Educational Research Journal, 28*(2), 249–263. https://doi.org/10.1080/01411920120122176

Mansor, A. N., Maniam, P. P., Hunt, M. C., & Nor, M. Y. M. (2016). Benefits and disadvantages of streaming practices to accommodate students by ability. *Creative Education, 7*(17), 2547. https://doi.org/10.3102/00346543043002163

Marks, R. (2014). The dinosaur in the classroom: What we stand to lose through ability-grouping in the primary school. In *FORUM* (Vol. 56, No. 1, pp. 45–54). Lawrence and Wishart.

Maurer, K. W. (2020). The effects of homogeneous ability grouping on low-level students' self-esteem, confidence, and motivation in reading (Doctoral dissertation).

McGaughy, J. R. (1930). Homogeneous grouping of pupils. *Childhood Education, 6*(7), 291–296. https://doi.org/10.1080/00094056.1930.10725227

McGillicuddy, D., & Devine, D. (2020). 'You feel ashamed that you are not in the higher group'—Children's psychosocial response to ability grouping in primary school. *British Educational Research Journal, 46*(3), 553–573. https://doi.org/10.1002/berj.3595

McManus, J. E. (2010). Social identity and ability grouping in a secondary school (Doctoral dissertation, Institute of Education, University of London). https://discovery.ucl.ac.uk/id/eprint/10019937

Mills, C. J., & Durden, W. G. (1992). Cooperative learning and ability grouping: An issue of choice. *Gifted Child Quarterly, 36*(1), 11–16. https://doi.org/10.1177/001698629203600103

Monday, T. U. (2020). Impacts of interview as research instrument of data collection in social sciences. *Journal of Digital Art & Humanities, 1*(1), 15–24. https://doi.org/10.33847/2712-8148.1.1_2

Neuendorf, K. A. (2018). Content analysis and thematic analysis. In *Advanced Research Methods for Applied Psychology* (pp. 211–223). Routledge.

Nomi, T. (2009). The effects of within-class ability grouping on academic achievement in early elementary years. *Journal of Research on Educational Effectiveness, 3*(1), 56–92. https://doi.org/10.1080/19345740903277601

Nusser, L., & Gehrer, K. (2020). Addressing heterogeneity in secondary education: Who benefits from differentiated instruction in German classes? *International Journal of Inclusive Education, 29*(12), 1–18.

Licensed Under Creative Commons Attribution (CC BY-NC)

Oakes, J. (1983). Tracking and ability grouping in American schools: Some constitutional questions. *Teachers College Record, 84*(4), 801–819. https://doi.org/10.1177/016146818308400409

Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.

OECD. (2016). Selecting and grouping students. In *PISA 2015 Results (Volume II): Policies and Practices for Successful Schools*. Paris, France: OECD Publishing. https://doi.org/10.1787/9789264267510-9-en

Okello, I. O. (2019). Cognitive based classroom streaming, self-esteem, and peer relationship among secondary school students in Lira District (Doctoral dissertation, Makerere University).

Park, V., & Datnow, A. (2017). Ability grouping and differentiated instruction in an era of data-driven decision making. *American Journal of Education, 123*(2), 281-306.

Piaget, J. (1990). *The child's conception of the world*. New York: Littlefield Adams.

Pinsonneault, C. A. (2015). Implementing math ability grouping to improve engagement of academically advanced students: An action research study (Doctoral dissertation, Capella University).

Richer, S. (1976). Reference-group theory and ability grouping: A convergence of sociological theory and educational research. *Sociology of Education, 49*(1), 65–71. https://doi.org/10.2307/2112394

Saleh, M., Lazonder, A. W., & de Jong, T. (2007). Structuring collaboration in mixed-ability groups to promote verbal interaction, learning, and motivation of average-ability students. *Contemporary Educational Psychology, 32*(3), 314–331. https://doi.org/10.1016/j.cedpsych.2006.05.001

Slavin, R. E. (1990). Achievement effects of ability grouping in secondary schools: A best-evidence synthesis. *Review of Educational Research, 60*(3), 471–499. https://doi.org/10.3102/00346543060003471

Solomon, Y. (2007). Experiencing mathematics classes: Ability grouping, gender and the selective development of participative identities. *International Journal of Educational Research, 46*(1–2), 8–19. https://doi.org/10.1016/j.ijer.2007.07.002

Stevens, L., & Wrenn, C. (2013). Exploratory (qualitative) research. In *Concise Encyclopedia of Church and Religious Organization Marketing* (p. 53).

Tan, C. Y., & Dimmock, C. (2022). The relationships among between-class ability grouping, teaching practices, and mathematics achievement: A large-scale empirical analysis. *Educational Studies, 48*(4), 471–489.

Tieso, C. L. (2003). Ability grouping is not just tracking anymore. *Roeper Review, 26*(1), 29–36.

Tzuriel, D. (2021). The socio-cultural theory of Vygotsky. In *Mediated Learning and Cognitive Modifiability* (pp. 53–66). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-75692-5_3

Van Houtte, M., & Demanet, J. (2016). Teachers' beliefs about students, and the intention of students to drop out of secondary education in Flanders. *Teaching and Teacher Education, 54*, 117–127.

Verenikina, I. M. (2003). Vygotsky's socio-cultural theory and the zone of proximal development. In H. M. Hasan, I. M. Verenikina, & E. L. Gould (Eds.), *Expanding the Horizon. Information Systems and Activity Theory* (pp. 4–14). Wollongong: University of Wollongong Press.

Vogelaar, B., Bakker, M., Elliott, J. G., & Resing, W. C. (2017). Dynamic testing and test anxiety amongst gifted and average-ability children. *British Journal of Educational Psychology, 87*(1), 75–89. https://doi.org/10.1111/bjep.12136

Vogl, K., & Preckel, F. (2014). Full-time ability grouping of gifted students: Impacts on social self-concept and school-related attitudes. *Gifted Child Quarterly, 58*(1), 51–68. https://doi.org/10.1177/0016986213513795

Vygotsky, L. S. (1981). The genesis of higher mental functions. In J. V. Wertsch (Ed.), *The concept of activity in Soviet psychology* (pp. 144–188). Sharpe.

Wang, H., King, R. B., & McInerney, D. M. (2021). Ability grouping and student performance: A longitudinal investigation of teacher support as a mediator and moderator. *Research Papers in Education, 38*(2), 121–142. https://doi.org/10.1080/02671522.2021.1961293

Wilkinson, S., Penney, D., & Allin, L. (2016). Setting and within-class ability grouping: A survey of practices in physical education. *European Physical Education Review, 22*(3), 336–354. https://doi.org/10.1177/1356336X15610784

Williams, M. H. (1972). Does grouping affect motivation? *The Elementary School Journal, 73*(3), 130–137.

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Influence of training resources on non-physician anaesthetists trained at Kenya Medical Training Colleges in western Kenya

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ABSTRACT

The severe shortage of health workers in sub-Saharan Africa is projected to worsen beyond 2030 due to rapid population growth, limiting access to safe, timely, and affordable surgical care. Anaesthesia services are particularly affected, with only about two anaesthesiologists per 100,000 people, leading to surgical delays and restricted access. This study assessed the influence of training resources on non-physician anaesthetists trained at Kenya Medical Training colleges in western Kenya. The study utilized the theory of labour shortage. The study utilized a descriptive survey design where stratified random sampling was used to classify Kenya Medical Training College (KMTC) and three campuses. Purposive sampling was used to select the samples with the required information. Proportionate sampling was employed to select a sample size within the samples that would reflect the numerical strength of the samples selected, and finally, a simple random sampling technique was used to accord each member a chance of being selected, and each choice would be independent of any other choice. The target population for the study was 200 students, 25 hospital administrators, and 25 lecturers. The study used the Yamane method to arrive at a sample size of 143 students, 24 hospital administrators, and 28 lecturers. Correspondingly, a pilot study was carried out, and feedback obtained was used to correct research instruments that were afterwards used to collect data in the field. Data was collected through validated questionnaires for students and interviews from lecturers. Descriptive and inferential analysis was utilized to analyze data both qualitatively and quantitatively. The results show that lecturing was the most common delivery method (100%), followed by skills labs (97%) and self-directed learning (92%). All respondents had been trained in the core Non-Physician Anaesthesia Providers (NPAP) curriculum content, which was considered highly relevant to their roles; 97% reported comprehensive topic coverage, and 83% found the depth adequate for practice. Respondents who rated training methods as highly effective had an 88% reduction in the odds of low employability and were three times more likely to report high job satisfaction. Consistent use of multiple delivery methods was associated with a 95% lower likelihood of low employability. Readily available expert guidance reduced the odds of low employability by a factor of 13. Conversely, unaffordable training costs doubled the likelihood of low employability, while exposure to out-dated or irrelevant resources tripled it. The findings of this study will provide evidence-based insights that can guide the enhancement of training programs, promote competency development, and improve the overall quality of anaesthesia services across the region. The study recommends that KMTCs should invest in establishing and maintaining well-equipped simulation laboratories across all campuses offering anaesthesia training.

Keywords: Anaesthetist, Employability, Learning, Non-Physian, Satisfaction, Simulation-Based Education, Training Resources

I. INTRODUCTION

Anesthesia is an important part of surgical treatment, and therefore anesthesia training must adhere to high quality standards to guarantee patient safety (Gelb et al., 2019). Training programs involve organized activities for increasing the technical skills of employees to enable them to do jobs efficiently (Ozkeser, 2019). Moreover, training creates opportunities for students and/or employees to gain work familiarity making them efficient once deployed (Ozkeser, 2019). This study will investigate the educational experiences of non-physician anesthesia students revealing the advantages and challenges of the training programs at higher learning institutions. Non physician anesthesia student training is an indispensable part of medical education. The increasing variety of healthcare treatments around the globe has prompted the rise in demand for surgeries. The World Health Organization (WHO) reported in 2015 that 2.8 million surgery procedures were conducted worldwide each year, with 5.7 million extra operations required to address the planet's fundamental surgical requirements (David et al., 2018).

Globally, the scarcity of well-trained Anaesthesiologists has been a serious healthcare concern for the developed and developing nations. The WHO has claimed that this scarcity has resulted in a significant gap in surgical

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and anaesthetic care in developing nations (Biccard & Green-Thompson, 2018). These nations have high budget deficits that limit the resources available for education particularly medical training. The ratio is estimated to be one anesthesiologist for 100,000 patients in contrast to one anesthesiologist for 25,000 persons in developed nations (Biccard & Green-Thompson, 2018). This scenario calls for effective training methods to maximize efficiency in healthcare service delivery despite the harsh realities. An evolving medical technological environment, scarcity of qualified trainers and resource inadequacies remain top challenges of anaesthesia education globally (Buléon et al., 2021). The fast advancement of healthcare technology calls for regular curriculum reviews and modifications (Buléon et al., 2021). Varying training standards across the globe has limited the effectiveness of Anaesthesiologists labour mobility further deepening the gap in healthcare (Morriss et al., 2018). This is since training standards employed in one region may be particularly suited for that region's unique circumstances (Buléon et al., 2021). Moreover, this reflects the resource gaps in the global society that impact clinical exposure levels affecting differences in anaesthetics care around the world. In many developing nations, there is a scarcity of trained anaesthesia lecturers (Morriss et al., 2018). As a result, anaesthesia practitioners may lack the necessary training to deliver safe anaesthesia care.

The African continent is severely understaffed with regards to aesthetic care. It is estimated that there are about 2 anaesthesiologist's for 100,000 people in Africa, resulting into high delays for surgeries and limited access to secure surgical care for maternal and paediatric care (Morriss et al., 2018). The standard of anaesthesia training in the continent is a serious issue reflected in the high rate of anaesthesia-related fatalities. Notably, it is believed that improved training might save 1 in 150 fatalities connected to anaesthesia (World Health Organization [WHO], 2019). High population growth in Africa further increases the demand for aesthetic care. This reality has stretched the medical capacities of many countries in the content. The training of non-physician anaesthesia students in Africa has specific challenges that influence the state of medical training on the region. Inadequate resources have seen a restriction on the access to simulation centers and contemporary medical technology undermining training curriculum (Gray et al., 2022). The growing demand for healthcare reaffirms the significance of examining the factors that influence the training of post-basic anaesthesia students in African universities and colleges. Furthermore, concerns such as regional differences in educational standards and the need for specialized measures to address distinct cultural and environmental factors highlight the importance of a localized research. Patient safety in Kenya is seriously threatened by a scarcity of anaesthesia practitioners and inadequate anaesthesia training (Lilaonitkul et al., 2020). Resource constraints are a serious barrier, with insufficient access to cutting-edge technology and simulation facilities impeding practical training (Lilaonitkul et al., 2020). Moreover, insufficient training facilities have seen the healthcare sector in the country fail to meet the demand for aesthetic care. A scarcity of experienced anaesthesia trainers who are further strained by massive workloads is a serious concern for the training program (Lilaonitkul et al., 2020).

1.1 Statement of the Problem

The provision of safe anaesthesia services in Kenya remains a major challenge due to the limited number of qualified physician anaesthetists. To bridge this gap, Kenya Medical Training Colleges (KMTCs) have established training programs for non-physician anaesthetists (NPAs) to support surgical and emergency care, particularly in county and sub-county hospitals (Ministry of Health [MOH], 2023). The success of these training programs depends largely on the adequacy and quality of training resources, including instructional materials, simulation laboratories, clinical equipment, and access to experienced faculty and clinical mentors (World Health Organization [WHO], 2020). Despite the critical role of NPAs in improving access to anaesthesia services, there have been persistent concerns regarding the adequacy of training resources in KMTCs, especially in Western Kenya (KMTC Annual Report, 2022). Some training campuses continue to face shortages of essential teaching aids, limited exposure to modern anaesthetic equipment, inadequate simulation laboratories, and insufficient opportunities for hands-on clinical experience. These deficiencies may hinder the acquisition of essential competencies, technical skills, and professional confidence among trainees (Zhao et al., 2022). Consequently, the quality of anaesthesia care provided by graduates may be compromised, posing potential risks to patient safety and overall healthcare outcomes (Mutua & Nyoni, 2022). There is limited empirical evidence assessing how the availability and utilization of training resources affect the quality of training outcomes among non-physician anaesthetist trainees in KMTCs (MOH, 2023; WHO, 2022). Without such evidence, it becomes difficult for policymakers and educational administrators to make informed decisions regarding investment in training infrastructure, curriculum improvement, and resource allocation. Therefore, this study seeks to investigate the influence of training resources on non-physician anaesthetists trained at Kenya Medical Training colleges in western Kenya.

1.2 Research Objectives

To assess the influence of training resources on NPAs trained at KMTC in Western Kenya on employability.

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1.3 Research Question

What training resources influence employability of non-physician anaesthetists trained at KMTCs in Western Kenya?

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Theory of Labour Shortage

The Theory of Labour Shortage, as proposed by Veneri (1999), provides a framework for understanding the imbalance between the demand for and supply of skilled labor within specific occupational groups or sectors. According to Veneri, labor shortages arise not merely from an absolute lack of workers, but from a mismatch between the skills possessed by the workforce and those demanded by employers. This concept shifts the focus from quantity to quality, emphasizing the importance of aligning training and education systems with the evolving requirements of the labor market. Veneri (1999) argued that persistent labor shortages often occur when training institutions and labor policies fail to adapt to technological changes, demographic shifts, or economic restructuring. For instance, industries experiencing rapid innovation tend to demand new competencies that traditional training systems may not provide. Consequently, even in the presence of high unemployment, employers report difficulties filling vacancies a phenomenon termed structural labor shortage. This theoretical view highlights that shortages are frequently skill-specific rather than universal, reflecting inefficiencies in workforce development and human capital planning. The theory also draws attention to the time lag between education and employment outcomes.

Veneri observed that educational institutions operate on relatively long cycles of curriculum revision and program delivery, whereas labor market demands can change quickly. This lag creates a temporary disequilibrium where the skills of graduates do not match current employer expectations. Thus, labor shortages can be mitigated by improving feedback mechanisms between employers, training providers, and policymakers to ensure continuous alignment of curricula with market needs. Subsequent studies have expanded on Veneri's framework to examine sectoral and regional variations in labor shortages. For example, research by Barnow et al. (2000) and Cappelli (2015) supports Veneri's argument that shortages often reflect institutional rigidities and information asymmetries, rather than a true scarcity of workers. Similarly, in the healthcare and education sectors, scholars have noted that shortages often stem from limited training resources, poor working conditions, and inadequate retention strategies rather than insufficient labor supply (Zurn & Dumont, 2008; Marć et al., 2019). These findings reinforce Veneri's view that policy interventions must target both training adequacy and labor market incentives. In recent years, the theory has gained renewed relevance amid global technological transformation and post-pandemic workforce disruptions. Studies applying Veneri's model to contemporary labor markets emphasize that addressing shortages requires not only expanding training capacity but also enhancing employability skills, promoting lifelong l earning, and ensuring flexibility in occupational mobility (World Economic Forum, 2020; ILO, 2022). The persistence of skill mismatches across sectors such as healthcare, information technology, and technical trades suggests that the core insights of Veneri's theory remain central to current debates on workforce development and education policy. The Theory of Labour Shortage is especially useful in this research for creating the conceptual framework. This theory tackles the widespread problem of a labour shortage in the healthcare industry, which is a problem that is continuously seen around the world.

2.2. Empirical Review

According to human capital hub training effectiveness refers to the impact that a training intervention has as measured by the achievement of the goals set before the training intervention. Training effectiveness largely depends on how the training is designed, delivered and implemented (Kreismann & Talaulicar, 2020).

. The other key facet of training and its effectiveness depends on the transfer of what has been learnt to the job. This specifically speaks to whether the individual who has attended the training is doing the job better after the training and whether the trainee has more knowledge after the training than before (Kreismann & Talaulicar, 2020).

The training delivery models should be flexible to meet various learning preferences and achieve comprehensive positive outcomes efficiently. In NPA training, traditional lecture-based methodologies give an understanding of information and theoretical ideas. The addition of lectures with simulated scenarios, hands-on practice, and interactive case studies, on the other hand, can accommodate to different learning styles and promote engaged learning (Bajwa et al., 2022). Widening instruction techniques in NPA training has regularly been shown in studies to be beneficial. Research conducted at KMTC in Eldoret, Kenya examined the efficacy of conventional lecture-based instruction with an integrated method that involved simulation and personal practice (Tibi et al., 2022). The results demonstrated that the integrated method greatly increased student academic performance, demonstrating the need of mixing varied training modalities to boost participation and educational outcomes (Tibi et al., 2022).

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The academic programme is a primary factor that can impact effectiveness of medical training particularly on non-physician anaesthetists. An effective curriculum should provide a clear and thorough framework for information acquisition and skill development, influencing the entire training experience and, ultimately, NPA performance. This includes well defined objectives, logical material arrangement, and suitable difficulty attention (Schleiff et al., 2021). This approach guarantees that NPA students are introduced to fundamental principles and abilities before progressing to more complicated concepts and expertise (Schleiff et al., 2021). It also encourages the progressive development of competence, allowing the students to get a thorough grasp of anaesthesia concepts and techniques before utilizing them in clinical practice.

The term resources refer not only to teaching methods and materials but also the time available for instruction and the knowledge and skills of teachers acquired through training and experience (Kibwana et al. 2018),). Teaching and learning Resources (TLR) comprises basically three components: material resources, physical facilities and human resources (Mutua & Nyoni, 2022). Studies done in the past about availability of TLR in education reveal that TLR are not always available in schools. This inadequacy of TLR has been of serious concern to educators (Kibwana et al. 2018),). Learning is a complex activity that involves interplay of students' motivation, physical facilities, teaching resources, and skills of teaching and curriculum demands (Thuranira et al., 2022). Availability of TLR therefore enhances the effectiveness of schools as they are the basic resources that bring about good academic performance in the students (Thuranira et al., 2022). The necessary resources that should be available for teaching and learning include material resources, human resource such as teachers and support staff and, physical facilities such as laboratories, libraries and classrooms.

Practical sessions allow a real-life situation for NPA students to practice their expertise and test their capabilities. These sessions help students to build confidence, fine-tune their skills, and handle possible issues before they meet them in actual medical circumstances (Svellingen et al., 2021). Research has proven that these sessions are fundamental in the professional development of NPA practitioners. For instance, a study investigated the efficacy of practical sessions during training for a NPA program in KMTC Kisumu, Kenya (Umutesi et al., 2019). The results revealed that students engaged in practical sessions honed actual expertise skills more proficiently than those exposed only to classroom learning (Umutesi et al., 2019).

This study looks at the influence of training delivery techniques on non-physician anaesthetists (NPAs). Classical lecture-based techniques are crucial for theoretical comprehension, recognizing the requirement for flexibility to suit varied learning preferences. Studies, on the other hand, constantly argue for a hybrid strategy that includes simulated scenarios, personal practice, and interactive case studies. The study intends to provide insights on improving training approaches for NPAs worldwide

Research has repeatedly shown that well-structured curricula have a beneficial effect on NPA training results. For instance, one study examined the efficacy of a competency-based curriculum at KMTC in Kisumu, Kenya (Umutesi et al., 2019). The efficacy of a competency-based curriculum at KMTC in Kisumu, Kenya, was examined in research. Comparing the results to the prior curriculum, the results showed significantly higher levels of student information retention, clinical skill competency, and self-reported confidence (Umutesi et al., 2019). This study emphasizes how crucial a systematic approach is to maximizing the results of NPA training.

Content structuring within a programme is critical for optimal learning. A well-structured curriculum begins with fundamental principles and subsequently builds on with more complicated subjects. This method guarantees that students understand the fundamentals before going into more complex parts of anaesthesia treatment (Livingston et al., 2022). Additionally, the difficulty gradient within a curriculum is critical in molding NPA training (Nevenglosky et al., 2019). A progressive escalation in the perceived degree of difficulty helps students to gain competency at every level before progressing to increasingly difficult assignments (Nevenglosky et al., 2019). This gradual approach builds confidence while reducing the danger of overloading students with complicated topics before they are ready for them.

III. METHODOLOGY

The study was conducted at selected KMTC campuses located in Western Kenya. This region comprises of thirteen counties that include Kisumu, Homabay, Nyamira, Migori, Kisii, Siaya, Vihiga, Kericho, Busia, Eldoret, Bomet, Bungoma and Kakamega. The study employed mixed method research, that is; a combination of descriptive research and correlational research approaches being used simultaneously. Descriptive survey design was used in making careful in-depth observations of a subject or phenomenon of interest. The study target population was 255 consisting of lecturers/clinical instructors, campus/hospital administrators and qualified NPAP graduates in the various counties in Kenya who completed their training between 2020-2023 at campuses in Kisumu, Kisii or Eldoret. The inclusion criteria were the lecturers/instructors and NPAP graduates in the various counties in Kenya who completed their training between the year 2020-2023 while the exclusion criteria were NPAP graduates in the various counties in Kenya who completed their training before 2020 and after 2023. Purposive sampling was used to select the samples

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with the required information. Proportionate sampling was employed to select a sample size within the samples that would reflect the numerical strength of the samples selected and finally simple random sampling technique was used to accord each member a chance of being selected and each choice would be independent of any other choice. In determining the study sample, the researcher was guided by Yamane's formula (Umar & Wachiko, 2021).). On the basis of the formula, the researcher arrived at a sample size of 143 NPA providers, 28 lecturers/instructors and 24 hospital administrators.

Data collection tools involved the use validated questionnaires, for NPA providers and interviews for lecturers/instructors and hospital administrators. The researcher incorporated triangulation in the data collection process in order to enhance verification and validation of the collected data. Triangulation is the use of multiple data collection techniques. This multi-faceted approach of data collection gave the researcher an opportunity to corroborate the collected data thus improving on the reliability of the study findings. The data collection instruments were subjected to a validation process. This process included seeking expert opinions from the study supervisors on the appropriateness of items included in the questionnaires. Feedback given by these experts helped in the improvement of the data collection instruments. A pilot study was conducted at Kakamega County Referral hospital capturing NPAs working in the hospital. Cronbach's alpha was used to analyze the reliability measures of the study instruments. Students' questionnaire had a reliability value of 0.783 showing that these instruments were reliable as indicated by Orodho (2014). To avoid plagiarism, all sources cited in the study were acknowledged.

Ethical considerations were also taken into account during data collection process. Permission to conduct the study in the region was sought from Ethics and Research Committee of MMUST and KMTC involved. During the data collection procession, the respondents were assured of the confidentiality of their identities. To ensure this was done, participants were requested not to write their names anywhere on the research instruments. This was necessary because it constituted an explicit willingness of the participants to voluntarily participate in the study. Data was analysed in line with the study objective with the aid of the Statistical Package for Social Sciences (SPSS) Version 27 computer software.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

A total of 143 monkey questionnaires were issued to NPAs and 52 interviews was conducted to hospital administrators and lecturers. A total of 143 (100%) questionnaires were filed and returned back from NPAs. Of these 3 (2%) of the questionnaires returned from NPAs were dropped out of the tally for having significant gaps in response for variable items. Therefore 140 (98%) questionnaires from NPAs were used in the study for analysis. According to Saunders *et al.* (2006) argument that 30 to 50% response rate is acceptably sufficient for statistical generalization.

4.2 Demographic Distribution

From the results in Table 1, the majority 69.3% of NPAs are male while female anaesthetists account for only 30.7%**.** This gender disparity may reflect the broader trend in Kenya where male dominance persists in technical and high-risk clinical fields, including anaesthesia. According to Spence (1973) gender disparity in technical and clinical cadres are well documented in many health systems. Explanations include social norms, differential access to training opportunities, and perceived occupational risks or working conditions that dissuade women from entering certain specialties (see gender and health workforce reviews). From a human-capital and signalling perspective, gender differences may reflect historical pipelines into clinical officer and technical programs. The results also show that 55% are aged between 31–40 years, followed by 21–30 years at 29.3%. This age pattern shows that the NPA workforce is relatively young and mid-career, reflecting KMTC's success in training anaesthetists who are quickly absorbed into the labor market. According Asamani et al. (2025), a relatively young to mid-career demographic is consistent with labour market literature suggesting that young professionals often adopt these roles first, while mid-career individuals balance experience and readiness. Also, Kenya's health labour market is seeing growing numbers of health workers entering practice in their 20s–30s due to expanded training capacity.

The analysis also shows that 75% of NPAs hold a Higher Diploma, the standard qualification offered by KMTC for anaesthesia training. Only 20% possess Bachelor's academic qualifications. From the results, all respondents were qualified to train at Kenya medical training college and therefore in a position to provide reliable information about the study at hand. On the other hand, the results shows that 67.2% NPAs graduated between 2020 and 2021 corresponding to a period of heightened healthcare demand due to COVID-19.The high number of 2020–2021 graduates reflects increased recruitment and training efforts during the pandemic to strengthen critical care capacity. The decreasing trend from 2022–2023 at 24.3% and 8.6% respectively may be attributed to reduced training intake or delayed enrollment cycles after the pandemic.

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Furthermore, results shows that majority of NPAs at 69.3% are employed in the private sector, while only 30.7% work in public institutions**.** This skew distribution suggests that private healthcare facilities and mission hospitals are the leading employers of KMTC-trained NPAs while the lower absorption in the public sector may reflect limited recruitment positions, budget constraints, or slow bureaucratic processes in county health systems. On the number of years before employment, the results shows that a significant majority 65% secured employment within 2–5 years of completing training, while a smaller group 25.7% were absorbed in less than 2 years**.** Only 9.3% took over 5 years to get employment. This distribution indicates moderate employability of KMTC-trained NPAs—most graduates eventually find work but often after a lag period, possibly due to limited job openings or regional mismatches. The delay also suggests the need for structured internship programs or partnerships within the healthcare institutions to facilitate smoother transition from training to practice. Early employment of within 2 years was likely facilitated by the COVID-19 pandemic's surge in demand for anaesthetic care professionals.

Table 1

Demographic Characteristics of Non-Physician Anaesthetists

Responses		**Frequency**	**Percent**
Gender	Male	97	69.3
	Female	43	30.7
	Total	**140**	**100.0**
Age	21-30	41	29.3
	31-40	77	55.0
	41-50	22	15.7
	Total	**140**	**100.0**
Education	Diploma	7	5.0
	Higher Diploma	105	75.0
	Bachelors	25	17.9
	Masters	3	2.1
	Total	**140**	**100.0**
Year of completion of NPA	2020	53	37.9
	2021	41	29.3
	2022	34	24.3
	2023	12	8.6
	Total	**140**	**100.0**
Currently employed	Public sector	43	30.7
	Private sector	97	69.3
	Total	**140**	**100.0**
Number of years before employment	Less than 2 years	36	25.7
	2-5 years	91	65.0
	more than 5 years	13	9.3
	Total	**140**	**100.0**

4.3 Analysis of Likert Scale

4.3.1 Likert Scale on Training Resources

The results in Table 2 examined the influence of training resources on the quality of training of non-physician anaesthetists (NPAs) in Kenya Medical Training Colleges (KMTCs) in Western Kenya. The findings revealed a composite mean score of 2.81 (SD = 1.179), suggesting that while some respondents agreed that training resources were adequate; there was notable variability across the campuses. Specifically, the study showed that textbooks were moderately available (M = 2.29), training was perceived as less affordable (M = 3.65), clinical equipment was often insufficient (M = 3.30), simulation labs were somewhat adequate (M = 2.18), access to expert guidance was inconsistent (M = 3.01), and training resources were fairly up to date (M = 2.43). The uneven access to teaching materials such as textbooks mirrors findings by Kibwana et al. (2018) and Edgcombe et al (2019), who observed that limited availability of learning resources in Kenyan health training institutions leads to disparities in learning experiences and competencies among students. According to the World Health Organization (2022), the standardization of learning materials across campuses is critical in achieving competency-based education and improving healthcare outcomes. Affordability challenges reported by the respondents align with studies by Johnston et al, (2020) and WHO (2020), which found that financial constraints limit enrolment and continuity in health workforce training programs. Cost barriers have been linked to student attrition, limited access to clinical placements, and

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reduced motivation among trainees. Hence, the findings highlight the need for KMTCs and the Ministry of Health to enhance bursaries, scholarships, and subsidy mechanisms to support trainee retention and equity. The inadequacy of clinical equipment noted in this study corroborates observations by Kibwana et al. (2018), who emphasized that limited access to anaesthesia machines and monitoring equipment impedes hands-on practice and skill acquisition.

Similarly, Mwasi and Orwa (2023) noted that practical deficiencies compromise clinical competence and confidence of graduates, which may eventually affect patient safety and quality of care. Although respondents rated simulation labs relatively positively (M = 2.18), the variability suggests unequal access and use across campuses. This finding is consistent with global literature indicating that simulation-based education (SBE) enhances skill acquisition and performance among anaesthesia trainees, particularly in low-resource settings (Robinson et al., 2024; WHO, 2022). However, the sustainability of SBE depends on faculty training, technical support, and regular curriculum integration. The near-neutral responses regarding access to expert guidance (M = 3.01) indicate inconsistent mentorship and supervision. Evidence from Kim *et a*l (2024), and WHO (2020) demonstrates that structured mentorship and clinical supervision are critical components of effective training, facilitating the transfer of simulation gains to real-world practice. Strengthening mentorship frameworks and continuous professional development for clinical instructors is therefore essential. Overall, the composite mean (2.81) reflects partial adequacy of training resources, implying significant heterogeneity among KMTC campuses. These results echo WHO (2022) and KMTC (2022) findings that disparities in resources contribute to unequal competency outcomes. Ensuring equitable distribution of training infrastructure and materials is thus imperative for producing competent NPAs capable of delivering safe anaesthesia care nationwide. The findings of this study emphasize the need for a multi-level strategy encompassing investment in essential equipment, enhancement of simulation-based training, provision of financial support, and strengthening of mentorship frameworks. These interventions align with Kenya's Health Workforce Strategic Plan (MOH, 2023), which underscores competency-based education and equitable access to training resources as cornerstones for healthcare quality improvement.

Table 2

Likert Scale on Training Resources

Methods	SA	A	N	D	SD	Mean	Std
Textbooks are available and adequate in terms of copies	44 31.4%	53 37.9%	1 0.7%	42 30%	-	2.29	1.202
The cost of training is adequately affordable	5 3.6%	29 20.7%	3 2.1%	76 54.3%	27 19.3%	3.65	1.118
Clinical equipment are readily accessible and sufficient	20 14.3%	27 19.3%	3 2.1%	71 50.7%	19 13.6%	3.30	1.318
Simulation labs adequately support training needs	36 25.7%	76 54.3%	2 1.4%	19 13.6%	7 5.0%	2.18	1.114
Access to expert guidance readily available and sufficient	17 12.1%	41 29.3%	5 3.6%	77 55%	-	3.01	1.157
Training resources, such as textbooks, clinical equipment, and simulation labs are up-to-date and relevant to the needs of non-physician anaesthetists	21 15%	82 58.6%	5 3.6%	20 14.3%	12 8.6%	2.43	1.164
Composite Mean and Std						**2.81**	**1.179**

4.3.2 Likert Scale on Job Satisfaction

Table 3 presents the responses on job satisfaction among non-physician anaesthetists trained at Kenya Medical Training Colleges (KMTCs) in Western Kenya. The composite mean score was 2.96 (SD = 1.071), suggesting that respondents were generally neutral but leaned slightly toward agreement that they were satisfied with their jobs. The highest mean was recorded for 'The workplace offers a very supportive environment for non-physician anaesthetists' (M = 3.57, SD = 0.907), indicating disagreement that their workplace environments are supportive. Similarly, the statement 'There is high recognition and appreciation for non-physician anaesthetists in the workplace' also had a relatively high mean (M = 3.29, SD = 1.055), reflecting dissatisfaction regarding recognition. On the other hand, respondents moderately agreed that 'There are many opportunities for professional development' (M = 2.39, SD = 1.057) and 'My salary highly influences my job satisfaction levels' (M = 2.61, SD = 1.210). The statement 'The work–life balance as a non-physician anaesthetist is very satisfying' yielded a mean of 2.71 (SD = 1.196), suggesting modest satisfaction, while 'I am highly satisfied with my current job' recorded M = 2.69 (SD = 1.046). Overall, the results indicate that although non-physician anaesthetists experience moderate satisfaction with certain aspects of their work, there are persistent concerns related to recognition, remuneration, and workplace support.

The findings of this study indicate that job satisfaction among non-physician anaesthetists remains moderate, characterized by mixed perceptions across dimensions such as remuneration, work–life balance, and professional

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recognition. This aligns with recent studies showing that health professionals in resource-constrained environments often experience only moderate levels of job satisfaction (Johnston et al., 2020). The moderate satisfaction regarding salary reflects on-going disparities in remuneration across the Kenyan health sector. According to the Ministry of Health (MOH, 2023), non-physician cadres such as anaesthetists frequently report pay inequities compared to other specialized health professionals. Similar findings by Edgcombe et al (2019) and Kibwana et al. (2018) highlight that financial incentives and compensation remain critical determinants of motivation and retention among anaesthesia providers. Regarding work–life balance, respondents indicated only modest satisfaction. This is consistent with studies showing that anaesthesia work schedules, often characterized by long hours and emergency call duties, reduce personal time and increase stress levels (Abdiwahab, (2024); WHO, 2022). Enhancing staffing levels and workload distribution has been recommended as a strategy to improve job satisfaction and reduce burnout among anaesthesia personnel. In terms of professional development opportunities, the relatively low mean (2.39) suggests that KMTC graduates perceive a fair number of growth opportunities within their field. This is encouraging and resonates with reports by the Kenya Medical Training College (2022), which identified increasing postgraduate and continuous professional development (CPD) opportunities as a strength of its programs. However, the literature cautions that without adequate mentorship and structured career progression, CPD alone may not translate into long-term retention (Kim et al., 2024). Conversely, recognition and appreciation recorded one of the least favourable responses, with a mean of 3.29. This mirrors findings by Mwasi and Orwa (2023), who found that lack of institutional recognition, contributes to professional dissatisfaction and attrition among non-physician clinicians. Recognition, as emphasized by Herzberg's two-factor theory, is a major motivator influencing job commitment and performance. Finally, the unsupportive workplace environment (M = 3.57) underscores systemic challenges such as inadequate equipment, high workload, and limited administrative backing. These conditions, as noted by Kibwana et al. (2018) and WHO (2022), can diminish morale, compromise service delivery, and hinder staff retention in public health institutions. Overall, the composite mean of 2.96 reveals a need for targeted interventions to enhance job satisfaction among non-physician anaesthetists. Strategies such as fair remuneration, improved working conditions, recognition mechanisms, and supportive supervision frameworks are essential to strengthen motivation, performance, and workforce stability.

Table 3

Likert Scale on Job Satisfaction

Job satisfaction	SA	A	N	D	SD	Mean	Std
I am highly satisfied with your current job as a non-physician anaesthetist?	9 6.4%	78 55.7%	1 0.7%	52 37.1%	-	2.69	1.046
My salary highly influence my job satisfaction levels as a non-physician anaesthetist	23 16.4%	63 45%	8 5.7%	38 27.1%	8 5.7%	2.61	1.210
The work-life balance as a non-physician anaesthetist very satisfying	17 12.1%	65 46.4%	10 7.1%	38 27.1%	10 7.1%	2.71	1.196
There are many opportunities for professional development in the non-physician anaesthetist sector	24 17.1%	74 52.9%	5 3.6%	37 26.4%	-	2.39	1.057
There is high recognition and appreciation for non-physician anaesthetists in the workplace	8 5.7%	37 26.4%	4 2.9%	89 63.6%	2 1.4%	3.29	1.055
Workplace offers a very supportive environment for non-physician anaesthetists?	7 5%	19 13.6%	1 0.7%	113 80.7%	-	3.57	0.907
Composite Mean and Std						**2.96**	**1.071**

To answer the research question on what training resources influence employability of non-physician anaesthetists trained at KMTCs in Western Kenya? The researcher carried out chi-square analysis to determine the associations' between training resources and employability of non-physician anaesthesia and the one that influences the most. The Chi-square analysis in Table 4 revealed that two training resources i.e. simulation laboratories ($p = 0.011$) and access to expert guidance ($p = 0.023$) had statistically significant associations with employability of non-physician anaesthetists. The other factors, including textbooks, affordability of training, and adequacy of clinical equipment, did not show significant relationships ($p > 0.05$). These findings suggest that practical, skill-based training environments and mentorship or expert guidance are stronger predictors of employability outcomes than the mere availability of theoretical learning materials or affordability of training programs.

The results highlight the critical role of experiential learning components namely simulation-based training and expert mentorship in improving the employability of non-physician anaesthetists. The significant influence of simulation laboratories aligns with research indicating that simulation-based education (SBE) enhances clinical competence, confidence, and readiness for professional practice, especially in low- and middle-income country (LMIC) contexts (Robinson et al., 2024; WHO, 2022). Simulation enables trainees to practice high-risk, low-

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frequency procedures safely, thereby bridging the gap between classroom learning and clinical realities (Zhao et al., 2022). Similarly, the significant association between access to expert guidance and employability underscores the value of mentorship and clinical supervision in professional skill development. According to Kim et al (2024), structured mentorship facilitates clinical reasoning, improves decision-making, and fosters professional identity formation among healthcare trainees. In the anaesthesia field, guidance from experienced practitioners is particularly vital given the technical and ethical demands of patient management (Kibwana et al., 2022). Conversely, the non-significant associations for textbook availability ($p = 0.769$) and affordability of training ($p = 0.858$) suggest that while these factors contribute to general learning conditions, they may not directly influence employability outcomes. This finding supports earlier studies indicating that employability in health professions is more strongly shaped by practical skill acquisition and clinical exposure than by traditional classroom resources (Ranabhat et al., 2024). Although clinical equipment availability did not reach statistical significance ($p = 0.370$), the descriptive data and prior research (Kibwana et al., 2018; WHO, 2020) indicate that inadequate equipment can still hinder the quality of practical training and preparedness for employment. Therefore, while equipment adequacy may not have shown a strong statistical relationship in this dataset, it remains a critical component of quality training infrastructure. Overall, these findings confirm that hands-on training environments and sustained mentorship are key determinants of employability for non-physician anaesthetists. Institutions should therefore invest in simulation-based education, ensure continuous access to skilled instructors, and strengthen partnerships with clinical training hospitals to enhance competency-based training outcomes.

Table 4

Chi-Square Analysis on Training Resources

Resources	Chi-square value	df	p-value
Textbooks are available and adequate in terms of copies	1.135	4	0.769
The cost of training is adequately affordable	1.320	4	0.858
Clinical equipment are readily accessible and sufficient	4.275	4	0.370
Simulation labs adequately support training needs	2.137	4	0.011
Access to expert guidance readily available and sufficient	2.806	4	0.023
Training resources, such as textbooks, clinical equipment, and simulation labs are up-to-date and relevant to the needs of non-physician anaesthetists	3.113	4	0.539

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study aimed to assess the influence of training resources on the employability of non-physician anaesthetists (NPAs) trained at Kenya Medical Training Colleges (KMTCs) in Western Kenya. The findings revealed that while several training resources contribute to the overall learning environment, simulation laboratories and access to expert guidance had a statistically significant influence on employability outcomes. This underscores the importance of practical, hands-on learning experiences and mentorship in preparing NPAs for the dynamic and demanding nature of anaesthesia practice. The results further showed that although textbooks, affordability of training, and adequacy of clinical equipment were viewed as important components of the training process, they did not directly predict employability. This suggests that theoretical knowledge and resource availability alone are insufficient to produce work-ready graduates. Instead, the acquisition of clinical competence through simulation-based learning, continuous mentorship, and exposure to real-world clinical environments, are the most critical determinants of employability. Overall, the study concludes that effective training of non-physician anaesthetists requires a competency-based approach supported by adequate infrastructure, mentorship, and simulation facilities. Strengthening these components will enhance the employability, confidence, and professional readiness of graduates, thereby contributing to improved anaesthesia service delivery in Kenya's healthcare system.

5.2 Recommendation

Based on the findings and conclusions of the study, the following recommendations are made: KMTCs should invest in establishing and maintaining well-equipped simulation laboratories across all campuses offering anaesthesia training. Simulation-based education should be integrated throughout the curriculum to improve clinical reasoning, technical proficiency, and decision-making and regular mentorship programs and clinical supervision frameworks should be institutionalized. Partnerships with experienced anaesthetists and teaching hospitals should be reinforced to ensure continuous guidance and skill transfer to trainees.

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REFERENCES

Abdiwahab, O. I. (2024). *Prevalence and factors associated with burnout among anaesthesia providers in Kenya* (Doctoral dissertation, University of Nairobi).

Asamani, J. A., Kwesiga, B., Okoroafor, S. C., Chagina, E., Gondi, J., Gura, Z., Motiri, F., Jumba, N., Ogumbo, T., Mutungi, N., Muleshe, S., Suraw, Y., Gitungo, H., Gatimbu, K., Wanyee, M., Oyoko, A., Nyakundi, A., Kaboro, S., Njogu, M. W., Monyoncho, M., … Wamae, A. (2025). Modelling the health labour market outlook in Kenya: Supply, needs and investment requirements for health workers, 2021-2035. *PLOS global public health*, *5*(1), e0003966. https://doi.org/10.1371/journal.pgph.0003966

Bajwa, S. S., Mehdiratta, L., & Kurdi, M. (2022). In pursuit of excellence in anaesthesia education: Vision, challenges and opportunities. *Indian Journal of Anaesthesia*, *66*(1), 3. https://doi.org/10.4103/ija.ija_43_22

Barnow, B. S., Trutko, J., & Piatak, J. S. (2000). *Labor shortages: Definition, causes, consequences, and cures*. The Urban Institute.

Biccard, B. M., & Green-Thompson, L. (2018). Socially accountable anesthesia: Matching human resources with community need for safe care. *Anaesthesia*, *73*(3), 271–274. https://doi.org/10.1111/anae.14161

Buléon, C., Eng, R., Rudolph, J. W., & Minehart, R. D. (2021). First steps towards international competency goals for residency training: A qualitative comparison of 3 regional standards in anesthesiology. *BMC Medical Education*, *21*(1), 565–569. https://doi.org/10.1186/s12909-021-03007-w

Cappelli, P. (2015). Skill gaps, skill shortages, and skill mismatches: Evidence and arguments for the United States. *ILR Review*, *68*(2), 251–290. https://doi.org/10.1177/0019793914564961

David, G. D., Guest, G. D., Tangi, V., Shrime, M. G., & Meara, J. G. (2018). Global surgery system strengthening. *Anesthesia & Analgesia*, *126*(4), 1329–1339. https://doi.org/10.1213/ane.0000000000002771

Edgcombe, H., Baxter, L. S., Kudsk-Iversen, S., Thwaites, V., & Bulamba, F. (2019). Training non-physician anaesthetists in sub-Saharan Africa: A qualitative investigation of providers' perspectives. *BMJ Open*, *9*(3), e026218.

Gelb, A., Law, T., Lipnick, M., Joshi, M., & Rath, G. (2019). The path to safe and accessible anaesthesia care. *Indian Journal of Anaesthesia*, *63*(12), 965. https://doi.org/10.4103/ija.ija_756_19

Gray, R., Cronjé, L., Kalipa, M., Lee, C., & Evans, F. (2022). Paediatric anaesthesia care in Africa: Challenges and opportunities. *Southern African Journal of Anaesthesia and Analgesia*, *28*(1), 4–6. https://doi.org/10.36303/sajaa.2022.28.1.2767

International Labour Organization. (2022). *World employment and social outlook: Trends 2022*. ILO.

Johnston, K., Guingona, M., Elsanousi, S., Mbokazi, J., Labarda, C., Cristobal, F. L., Upadhyay, S., Othman, A. B., Woolley, T., Acharya, B., Hogenbirk, J. C., Ketheesan, S., Craig, J. C., Neusy, A. J., & Larkins, S. (2020). Training a fit-for-purpose rural health workforce for Low- and Middle-Income Countries (LMICs): How do drivers and enablers of rural practice intention differ between learners from LMICs and high income countries?. *Frontiers in Public Health*, *8*, 582464. https://doi.org/10.3389/fpubh.2020.582464

Kenya Medical Training College. (2022). *Annual training and resource utilization report*. Nairobi: KMTC Press.

Kibwana, S., Yigzaw, M., Molla, Y., van Roosmalen, J., & Stekelenburg, J. (2018). Job satisfaction among anesthetists in Ethiopia: A national cross-sectional study. *The International Journal of Health Planning and Management*, *33*(4), e960–e970.

Kim, D. T., Applewhite, M. K., & Shelton, W. (2024). Professional identity formation in medical education: Some virtue-based insights. *Teaching and Learning in Medicine*, *36*(3), 399–409.

Kreismann, D., & Talaulicar, T. (2020). Business ethics training in human resource development: A literature review. *Human Resource Development Review, 20*(1), 153448432098353. https://doi.org/10.1177/1534484320983533

Lilaonitkul, M., Mishra, S., Pritchard, N., Andhoga, J., Olang', P., Kibet, E. B., Walker, I. A., Hart, J., & Byrne-Davis, L. (2020). Mixed methods analysis of factors influencing change in clinical behaviors of non-physician anesthetists in Kenya following obstetric anaesthesia training. *Anaesthesia, 75*(10), 1331–1339. https://doi.org/10.1111/anae.15091

Livingston, P., Nyirigira, G., & Mossenson, A. (2022). Anesthesia curriculum design for the global setting. *Update in Anaesthesia*, *36*, 54–59.

Marć, M., Bartosiewicz, A., Burzyńska, J., Chmiel, Z., & Januszewicz, P. (2019). A nursing shortage: Can we expect a global crisis? *International Nursing Review*, *66*(1), 9–16. https://doi.org/10.1111/inr.12473

Ministry of Health. (2023). *Health workforce report: Human resources for health in Kenya*. Nairobi: Government Printer.

Morriss, W. W., Ottaway, A., Milenovic, M., Gore-Booth, J., Haylock-Loor, C., Onajin-Obembe, B., Barreiro, G., & Mellin-Olsen, J. (2018). A global anesthesia training framework. *Anesthesia & Analgesia*, *128*(2), 383–387.

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Mutua, M. M., & Nyoni, C. (2022). Standards for undergraduate nursing e-learning programmes in low resource settings: A feasibility study. SSRN. https://doi.org/10.2139/ssrn.4271163

Mwasi, T. S., & Orwa, B. H. (2023). A desk review of career as reward management practices and employee retention of medical personnel in referral hospitals. *International Academic Journal of Human Resource and Business Administration, 4*(3), 145–160.

Nevenglosky, E., Cale, C., & Panesar Aguilar, S. (2019). Barriers to effective curriculum implementation. *Research in Higher Education Journal, 36*, 30–36.

Orodho, J. A. (2014). Policies on free primary and secondary education in East Africa: Are Kenya and Tanzania on course to attain Education for All (EFA) goals by 2015? *IOSR Journal of Humanities and Social Sciences, 19*(1), 11–20.

Ozkeser, B. (2019). Impact of training on employee motivation in human resources management. *Procedia Computer Science, 158*, 802–810.

Ranabhat, S. K., Kunjukrishnan, M. L., Dubey, M., Curran, V., Dubey, A. K., & Dwivedi, N. (2024). Exploring the usage of learning resources by medical students in the basic science stage and their effect on academic performance. *BMC Medical Education, 24*(1), 543.

Robinson, S. J., Ritchie, A. M., Pacilli, M., Nestel, D., McLeod, E., & Nataraja, R. M. (2024). Simulation-based education of health workers in low-and middle-income countries: A systematic review. *Global Health: Science and Practice, 12*(6), 8–12.

Saunders, C., Sivo, S. A., Chang, Q., & Jiang, J. J. (2006). How low should you go? Low response rates and the validity of inference in IS questionnaire research. *Journal of the Association for Information Systems, 7*(1), 17.

Schleiff, M. J., Mburugu, P. M., Cape, J., Mwenesi, R., Sirili, N., Tackett, S., Urassa, D. P., Hansoti, B., & Mashalla, Y. (2021). Training curriculum, skills, and competencies for global health leaders: Good practices and lessons learned. *Annals of Global Health, 87*(1), 64. https://doi.org/10.5334/aogh.3212

Spence, M. (1973). The signaling role of education. *The Quarterly Journal of Economics, 87*(3), 355–374.

Svellingen, A. H., Røykenes, K., Forstrønen, A., Assmus, J., & Brattebø, G. (2021). Examining predictive factors of nursing students' self-confidence in multiple simulation sessions: A randomized controlled study. *Nurse Education in Practice, 57*, 103231. https://doi.org/10.1016/j.nepr.2021.103231

Thuranira, J., Ikiara, L., & Thuba, E. (2022). Influence of teaching learning resources on academic performance among public primary schools in Laikipia West Sub-County. *EdinBurg Peer Reviewed Journals and Books Publishers Journal of Education, 2*(3), 1–9. http://repository.kemu.ac.ke/bitstream/handle/123456789/1403/Josephine%20Published%20manuscript.pdf?sequence=1&isAllowed=y

Tibi, T., Regina, B., Musyoka, K., Okumu, W., Anyango, C., & Mutiria, B. (2022). Individual factors influencing blended learning among students in Kenya Medical Training College. *Journal of Health, Medicine and Nursing, 8*(2), 23–34. https://doi.org/10.47604/jhmn.1651

Umar, A. M., & Wachiko, B. (2021). Tara Yamane (1967), Taro Yamane method for sample size calculation: The survey causes of mathematics anxiety among secondary school students in Minna metropolis. *Mathematical Association of Nigeria, 46*(1), 188.

Umutesi, G., McEvoy, M. D., Starnes, J. R., Sileshi, B., Atieli, H. E., Onyango, K., & Newton, M. W. (2019). Safe anesthesia care in Western Kenya: A preliminary assessment of the impact of nurse anesthetists at multiple levels of government hospitals. *Anesthesia & Analgesia, 129*(5), 1387–1393.

Veneri, C. M. (1999). Can occupational labor shortages be identified using available data? *Monthly Labor Review, 122*(3), 15–21. https://doi.org/10.21916/mlr.1999.13

World Economic Forum. (2020). *The future of jobs report 2020*. WEF.

World Health Organization. (2019). *Safe surgery*. https://www.who.int/teams/integrated-health-services/patient-safety/research/safe-surgery

World Health Organization. (2020). *Global report on health workforce education and training*. WHO Press.

World Health Organization. (2022). *Strengthening anaesthesia workforce in low- and middle-income countries*. WHO Press.

Zhao, Y., Osano, B., Were, F., Kiarie, H., Nicodemo, C., Gathara, D., & English, M. (2022). Characterising Kenyan hospitals' suitability for medical officer internship training: A secondary data analysis of a cross-sectional study. *BMJ Open, 12*(5), e056426.

Zurn, P., & Dumont, J. C. (2008). Health workforce and international migration: Can New Zealand compete? *OECD Health Working Papers, No. 33*. OECD Publishing.

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The effect of technology readiness on e-procurement adoption in Zanzibar's public sector: A case of the Zanzibar Public Procurement Regulatory Authority

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ABSTRACT

Even while e-procurement technologies have become more widely used worldwide, many underdeveloped nations, including Zanzibar, still struggle to fully digitize their procurement procedures. This study looked at how technology readiness affected the Zanzibar Public Procurement Regulatory Authority's (ZPPRA) adoption of e-procurement. Based on the Technology-Organization-Environment (TOE) architecture and Parasuraman's Technology Readiness Index (TRI), the study evaluated how e-procurement adoption is influenced by optimism, innovativeness, discomfort, and insecurity. 85 employees completed structured questionnaires as part of a quantitative research design, and 70 valid responses were evaluated using descriptive and inferential statistics using SPSS (version 28) and AMOS (version 26). The results showed that e-procurement adoption is positively and significantly impacted by technical readiness. In particular, while discomfort and uneasiness limited adoption, optimism and inventiveness increased user confidence and system utilization. However, effective implementation is still hampered by institutional and governance issues such as inadequate Information and Communication Technology [ICT] infrastructure, conflicting oversight agency mandates, and political meddling. The findings show that stronger optimism and innovativeness, coupled with lower discomfort and insecurity, enhance the effective use of the E-ProZ system. This highlights that e-procurement success in Zanzibar depends equally on users' readiness and supportive technology. The study suggests that in order to improve technology-driven procurement reforms in Zanzibar and other developing contexts, ICT capacity should be increased, staff digital competency should be strengthened, institutional autonomy should be ensured, and governance structures should be aligned.

Keywords: E-Procurement Adoption, Governance, ICT Infrastructure, Technology Readiness, Technology Readiness Index (TRI), Technology–Organization–Environment (TOE) Framework

I. INTRODUCTION

Global procurement procedures have been drastically altered by the quick development of information and communication technologies (ICTs). E-procurement, as defined by the World Bank (2021) and the Organisation for Economic Co-operation and Development [OECD] (2016), is the process of integrating ICT into procurement processes in order to increase value for money, accountability, efficiency, transparency, and justice. Neupane et al. (2012) and Gunasekaran and Ngai (2008) state that institutional readiness, user acceptance of digital systems, and technological infrastructure are critical to the effective adoption of e-procurement systems. Therefore, procurement reforms have been positioned as important tools for advancing anti-corruption and good governance measures in many developing economies (Basheka & Bisangabasaija, 2019; UNCTAD, 2020). However, their application is still inconsistent throughout Sub-Saharan Africa, where human capacity limitations and a lack of technological infrastructure continue to compromise their efficacy (Mambo & Muriithi, 2020; Gichuki & Were, 2023).

A growing body of research has linked low levels of e-procurement adoption to insufficient technology readiness, user resistance, and system complexity (Bakar et al., 2020; Oyeyemi et al., 2023). In mainland Tanzania, the Public Procurement Regulatory Authority (PPRA) introduced the Tanzania National e-Procurement System (TANePS) to enhance accountability, transparency, and efficiency in public procurement. Conversely, Zanzibar through the Zanzibar Public Procurement Regulatory Authority (ZPPRA) developed its own e-procurement platform, E-ProZ (Electronic Procurement Zanzibar), under the legal framework of the Zanzibar Public Procurement and Disposal of Public Assets Act (ZPPDA, 2020). The E-ProZ system was designed to facilitate end-to-end digital procurement from tender advertisement and submission to evaluation and contract management. Despite these reforms, full adoption and consistent utilization remain limited, as many departments still rely on manual processes (Controller and Auditor General [CAG], 2023; Moshi & Komba, 2023).

The persistence of paper-based procedures has led to inefficiencies, reduced transparency and lost opportunities for data-driven decision making (Msuya & Malongo, 2022). Beyond legal and technical limitations, studies highlighted

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that organizational behavior and human readiness play decisive roles in determining digital transformation success (Parasuraman, 2000; Mutua et al., 2024; Oyeyemi et al., 2023). Parasuraman (2000) introduced the Technology Readiness Index (TRI) to assess individuals and organization's predispositions toward adopting and utilizing new technologies. According to Parasuraman and Colby (2015), technology readiness comprises enablers (optimism and innovativeness) and inhibitors (discomfort and insecurity), which have been empirically validated in diverse contexts (Tsourela & Giaglis, 2022).

From a theoretical perspective, this study integrates the TRI and TOE frameworks (Tornatzky & Fleischer, 1990; Oliveira & Martins, 2011). The TRI captures the psychological readiness of users, while the TOE emphasizes the organizational and environmental factors such as ICT infrastructure, leadership, and regulatory environment that shape technology adoption in public institutions. The integration of these models provides a holistic lens for understanding how individual and institutional factors interact to influence e-procurement adoption within Zanzibar's public sector.

Consequently, this study focuses on examining the effect of technology readiness on e-procurement adoption at the Zanzibar Public Procurement Regulatory Authority (ZPPRA), using the E-ProZ system as the reference point. It draws from empirical literature to develop hypotheses and a conceptual model that tests the relationship between readiness dimensions and adoption outcomes. By addressing this critical yet underexplored behavioral dimension, the study aims to inform policy and institutional strategies that can strengthen digital capacity, enhance user competence, and accelerate effective e-procurement adoption in Zanzibar and comparable developing contexts.

1.1 Statement of the Problem

Despite the deliberate efforts undertaken by the Revolutionary Government of Zanzibar to publicly modernize procurement through digital reforms, the actual adoption and utilization of e-procurement system remain inconsistent, under-developed and far below their intended potential (ZPPDA, 2020; CAG, 2023; United Republic of Tanzania. [URT], 2020).

The Zanzibar government led initiative through E-ProZ system was aimed at enhancing transparency, accountability and efficiency. However, many departments and units at ZPPRA continue to rely on manual procedures or semi-automated processes, undermining the expected benefits of reform (World Bank, 2021; Moshi & Komba, 2023). While legal and regulatory framework exists, their practical effectiveness has been hindered by low system uptake, weak enforcement mechanism and the persistent operational inertia.

The recent assessment by Controller and Audit General – CAG (2023) revealed the recurring technical and institutional challenges affecting E-ProZ performance including inadequate ICT infrastructure, unreliable internet connectivity and limited technical support system. Moreover, the overlapping mandates between ZPPRA with e-Government Agency of Zanzibar (e-GAZ) following the administrative transfer of system management have blurred accountability and weakened regulatory oversight. On top of that, the system development through PPP (Public - Private Partnership) with OZON – International (Oman) had aimed at accelerating digitalization, however, the system was hindered by the induced contractual and compliance complexities that further restricted operational autonomy and fiscal efficiency.

Most Sub-Saharan African studies on e-procurement adoption have focused on the actor's declining the adoption and implementation of electronic systems such as infrastructure deficits, compliance gaps and weak enforcement mechanism (Basheka & Bisangabasaija, 2019; Gichuki & Were, 2023). Moreover, existing studies points out that the success of implementation largely depends on how mentally and behaviorally prepared institutional actors are (Parasuraman, 2000; Mutua et al., 2024; Oyeyemi et al., 2023). The TRI traits i.e. optimism, innovativeness, discomfort and insecurity was identified as the key factors shaping technology acceptance and utilization. However, there is lack of empirical validation on how technology readiness influence e-procurement adoption within Zanzibar context, as often researchers extrapolate findings from mainland-Tanzania and other African countries with different technology background, administrative loophole and resources constraints (Ismail & Harun, 2021; Bakar et al., 2020).

Consequently, a critical gap persists in understanding how technology readiness affects public officer's intension to accept and effectively use e-procurement system in Zanzibar. Thus, if user's behavior is overlooked, technological systems may not be used effectively, causing resource waste, resistance and lack of transparency. Therefore, relationship between technology readiness correlations to e-procurement adoption must be empirically studied, especially within ZPPRA and E-ProZ system to guide evidence-based policy reforms and to enhance digital governance in Zanzibar.

1.2 Research Objectives

i. To assess the influence of optimism on e-procurement adoption at ZPPRA.
ii. To determine the effect of innovativeness on e-procurement adoption at ZPPRA.
iii. To examine how discomfort affects e-procurement adoption at ZPPRA.
iv. To analyze the effect of insecurity on e-procurement adoption at ZPPRA.

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v. To evaluate the overall contribution of technology readiness dimensions to the effective use of the E-ProZ system within ZPPRA.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study is anchored on the Technology Readiness Index (TRI) developed by Parasuraman (2000) and supported by the Technology-Organization-Environment (TOE) framework proposed by Tornatzky and Fleischer (1990). Together, these frameworks explain how individual psychological readiness and institutional contexts influence adoption decisions. The TRI model assesses user's perception toward embracing new technologies across four dimensions: optimism, innovativeness, discomfort and insecurity (Parasuraman & Colby, 2015). As a predictor of digital adoption, the validation of the model has been assessed in several studies (Tsourela & Giaglis, 2022; Mutua et al., 2024). Within ZPPRA, optimism reflects the belief that e-procurement enhances transparency and efficiency; innovativeness captures staffs willingness toward exploring new digitalized tools; discomfort and insecurity reflect anxiety, uneasy and perceived risks associated with limited literacy of using ICT technologies and system reliability (CAG, 2023; ZPPRA, 2024).

On the other hand, the TOE framework situates technology adoption within technology, organization and environment framework contexts (Oliveira & Martins, 2011). The technology context constitutes advanced and adequate ICT infrastructure and system integration; the organization context encompasses leadership commitment and support, adequate resources allocation and staff competency; and environmental context represent legal, regulatory and social-political environment. TOE has been widely applied in various procurement studies (Bakar et al., 2020; Hassan & Mungai, 2022) purports to extrapolate how internal capabilities and external pressure shape digital transformation. Integrating TRI and TOE framework provides a holistic approach by linking human readiness factors with institutional enablers. As TRI focuses on behavioral readiness while TOE diverge into explaining organizational preparedness. Together, they bridge the psychological and institutional dimensions of e-procurement adoption, offering a comprehensive framework for analyzing digital transformation in public-sector contexts such as Zanzibar.

2.1.1 Technology Readiness and E-Procurement Adoption

Technology readiness influences how public officers perceive, accept and use e-procurement systems. According to Parasuraman (2000), individuals high in optimism and innovativeness are more willing to experiment with new technologies, while those affected by discomfort and insecurity tend to resist adoption. In public procurement, technology readiness determines how staff interpret and use digital platforms to promote transparency and accountability (Gunasekaran & Ngai, 2018; Oyeyemi et al., 2023).

Studies in developing countries demonstrated that user readiness positively affects the sustainability of e-procurement system (Basheka & Bisangabasaija, 2019; Asogwa, 2020). For instance, Mutua et al. (2024) found that officers with high optimism and innovativeness perceived e-procurement as useful and easy to use, showing the conceptual linkage between TRI and the Technology Acceptance Model (TAM) (Davis, 1989). However, challenges such as inadequate ICT capabilities, inadequate digital training and limited management support continue to constrain adoption (Gichuki & Were, 2023). These barriers highlight the need to assess the joint contribution of behavioral readiness and preparedness of institutional actors in explaining e-procurement adoption.

2.1.2 Dimensions of Technology Readiness

Optimism and E-Procurement Adoption: Optimism refers to a positive belief that technology enhances efficiency, productivity and service delivery (Parasuraman, 2000). Optimistic employees view e-procurement as a valuable innovative tool that can reduce corruption and improve transparency. Studies confirms that optimism assert positive effect on technology acceptance (Aboelmaged, 2010; Croom & Brandon-Jones, 2017). At ZPPRA, optimism encourages proactive system utilization, fostering confidence and trust in the E-ProZ system.

Innovativeness and E-Procurement Adoption: Innovativeness explains the individual's willingness to adopt and experiment with new technologies (Parasuraman & Colby, 2015). Innovative officers are typically identified as early adopters who encourage peers to embrace digital change. Studies by Gunasekaran and Ngai (2018) and Mutua et al. (2024) found that innovativeness supports experimentation and knowledge sharing. Within ZPPRA, innovativeness reflects readiness to champion E-ProZ usage and align with modern ICT-driven reforms.

Discomfort and E-Procurement Adoption: Discomfort denotes perceived lack of control or anxiety when using technology (Parasuraman, 2000). Officers who find digital systems complex may revert to manual processes. Studies by Asogwa (2020) and Vaidya et al. (2016) indicate that discomfort reduces system utilization. In Zanzibar, limited ICT literacy, unreliable internet, and inadequate training increase discomfort, discouraging full E-ProZ adoption.

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*Insecurity and E-Procurement Adoption:*Insecurity reflects fear of data loss, privacy breaches or system unreliability (Parasuraman & Colby, 2015). Users skeptical of system security are less likely to engage with e-procurement platforms. Aboelmaged (2010) and Ismail & Harun (2021) found that insecurity erodes user confidence in digital systems. Within ZPPRA, insecurity manifests as mistrust in E-ProZ data protection, constraining adoption.

Contextual Challenges of the E-ProZ System in Zanzibar: The implementation of the Electronic Procurement Zanzibar (E-ProZ) marked a milestone in promoting procurement efficiency and transparency. However, its rollout has faced major institutional and governance inconsistencies with the Public Procurement and Disposal of Public Assets Act of 2016. Legally, ZPPRA was mandated to manage and control the system, but operational control was outsourced to e-Government Agency of Zanzibar (eGAZ), creating overlapping mandates and declining accountability.

The E-ProZ development was managed under a Public - Private Partnership (PPP) with OZON International (Oman), of which was influenced by political aspects, deviating from alignment of Zanzibar's legal procurement framework. Consequently, compliance gap and recurring costs (registration and commission fees) emerged, which in turn increased financial burdens for procuring entities. The Methodology for assessing procurement systems (MAPS) report (2023) had also cited issues associated with governance misalignments that weakens regulatory oversight

The practical transfer of operational control from ZPPRA to eGAZ had reduced transparency and curtailed regulatory independence. Since political interference prioritized centralized control over professional autonomy, issues like accountability and value for money principles were undermined. Thus, e-ProZ encountered technical issues, extending into government, legal and institutional domain. In doing so, addressing these issues requires capacity strengthening, legal realignment and restoration of regulatory authority to uphold good governance and system sustainability.

2.2 Empirical Review

The evidences outlined in various empirical review shows that, optimism is a vital indicator in encouraging public officers to adopt e-procurement platforms. Studies conducted in Kenya and Nigeria's public entities found that, employees with positive attitudes towards digitalized platforms are more likely to perceive the systems as a tool for improving accountability, efficiency and transparency (Aboelmaged, 2010; Mutua et al., 2024). In similar vein, a study conducted in Uganda and Tanzania revealed that, in using digital systems, optimism enhances confidence and motivates users toward exploring the full potential of system (Basheka & Bisangabasaija, 2019; Bakar et al., 2020).

In relation to innovativeness, prior studies highlighted that, innovative officers tend to drive technological changes within their organizations. For instance, the study by Gunasekaran and Ngai (2018) and Hassan and Mungai (2022) observed that, innovative employees helps to sustain e-procurement usage through sharing knowledge and physical experiment and experience with the systems features. Therefore, innovativeness acts as a catalyst for institutional digital transformation.

Conversely, discomfort has been reported as a hindrance toward effective e-procurement usage. The study by Asogwa (2020) and Vaidya et al. (2016) indicated that, when the system make user's being overwhelmed, nervousness, uncertain or technically unprepared, they tend to revert to manual procurement methods. Such issues are often created by the limited ICT literate rate, unreliable internet and system connectivity or inadequate technical support. These factors are still visible in many public institutions in Africa.

Similarly, insecurity has been also identified as the behavioral inhibitor in adopting e-technologies. Users who are concerned about potential data loss, exposure of confidential information or system manipulation are less likely to trust and use e-procurement platforms effectively (Ismail & Harun, 2021; Tsourela & Giaglis, 2022). Studies have emphasized that, improving cyber-security mechanisms and data assurance can help in confidence building and increase system usage among public servants.

In summary, from most reviewed sources, the results confirmed that, optimism and innovativeness are key enablers, while discomfort and insecurity served as barriers to e-procurement adoption. However, few studies have outlined the relationship within Zanzibar's contexts. This study therefore suggest that, there is a need for empirical validation of how these technology readiness dimensions jointly influence the E-ProZ adoption at ZPPRA.

2.2.1 Measurement and Operationalization of Variables

The Technology Readiness Index (TRI) and e-procurement adoption model constructs were quantified in this study using standardized measuring scales. A five-point Likert scale, with 1 denoting strongly disagree and 5 denoting strongly agree, was used to measure each concept. To guarantee dependability and content validity, the measurement items were modified from approved tools utilized in earlier empirical research.

Four dimensions - optimism, inventiveness, discomfort, and insecurity - were used to operationalize technology readiness as an independent variable (Parasuraman, 2000). Additionally, the degree of system utilization, integration, compliance, and confidence was reflected in the operationalization of e-procurement adoption, a dependent variable

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(Vaidya et al., 2016; Asogwa, 2020). Each factor assessed how well institutions use, integrate, and adhere to the E-ProZ system while upholding transparency and confidence in their digital procurement processes.

Before analysis, the measurement scales were subjected to validity and reliability testing using Confirmatory Factor Analysis (CFA) in AMOS and internal consistency tests in SPSS. Only items with standardized loadings ≥ 0.50 and Cronbach's Alpha ≥ 0.70 were retained, ensuring robust measurement quality consistent with recommendations by Hair et al. (2021) and Kline (2016).

Table 1

Measurement and Operationalization of Variables

Variable	Dimensions	Measurement Focus	Scale	Sources
Technology Readiness (Independent Variable)	Optimism	Belief that E-ProZ improves efficiency and accountability (e.g., "Using the E-ProZ system enhances my work performance and decision-making.")	5-point Likert scale	Parasuraman (2000); Bakar et al. (2020)
	Innovativeness	Willingness to experiment with new system features (e.g., "I like exploring new functions of the E-ProZ system.")	5-point Likert scale	Parasuraman & Colby (2014); Rahayu & Day (2017
	Discomfort	Perceived difficulty or anxiety using the system (e.g., "I feel stressed when using E-ProZ without assistance.")	5-point Likert scale	Parasuraman (2000)
	Insecurity	Fear of data loss or unauthorized access (e.g., "I am concerned about the confidentiality of data submitted through E-ProZ.")	5-point Likert scale	Parasuraman & Colby (2014);
E-Procurement Adoption (Dependent Variable)	System Usage	Frequency and consistency of using E-ProZ for procurement functions	5-point Likert scale	Gunasekaran & Ngai (2018); Mutua et al. (2024)
	System Integration	Degree of linkage between E-ProZ and other financial/audit systems	5-point Likert scale	Vaidya et al. (2016); Oyeyemi et al. (2023)
	Compliance	Adherence to procurement laws and procedures through E-ProZ	5-point Likert scale	Bakar et al. (2020)
	Trust and Transparency	Confidence in system integrity and fairness of transactions.	5-point Likert scale	Croom & Brandon-Jones (2017); Asogwa (2020)

III. METHODOLOGY

3.1 Research Design

The study employed a descriptive cross-sectional research design. A descriptive design was chosen because it allows for the systematic collection of quantitative data, to describe characteristics and relationships among variables without manipulation. The cross-sectional approach was appropriate since data were collected at a single snapshot from employees of the Zanzibar Public Procurement Regulatory Authority (ZPPRA) to examine the relationships between *Technology Readiness* dimensions and *E-Procurement Adoption.*

3.2 Target Population and Sample Size

The target population comprised 567 employees of ZPPRA across different departments and units such as Procurement, ICT, Finance, Legal, Human Resources and Monitoring and evaluation units. The sample size was determined using Yamane's formula, at a 90% confidence level and a 10% margin of error:

$$n=N/1+N\ (e)^2$$

Where;

n = required sample size, N = population size (567), e = margin of error (0.10)

The calculated sample size was approximately to 85 respondents, which was proportionately distributed among the key departments to ensure fair representation of E-ProZ users.

3.3 Data Collection Instrument

Structure questionnaire was used to collect primary data, upon which the questionnaires were divided into three sections, namely; Demographic Informations (e.g. age, gender, education, work experience). Technology Readiness Dimensions i.e. optimism, innovativeness, discomfort and insecurity (adapted from Parasuraman, 2000; Parasuraman & Colby, 2015). E-Procurement Adoption: items derived from validated scales in prior e-procurement studies (e.g., Aboelmaged, 2010; Gunasekaran & Ngai, 2018). All items were on a five-point Likert scale measurements, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

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3.4 Data Analysis Techniques

Data analysis involved both descriptive and inferential statistics using SPSS version 28 and AMOS version 26.

3.5 Descriptive Analysis

Frequencies, means, percentages and standard deviations were used to summarize respondent's demographic characteristics and the distribution of study variables.

3.5.1 Inferential Analysis (SEM Approach)

Structural Equation Modeling (SEM) was applied to test the hypothesized relationships among the variables. The analysis followed the two-step approaches, as recommended by Hair et al. (2021) and Kline (2016):

3.5.2 Measurement Model (Confirmatory Factor Analysis - CFA)

Reliability and validity was tested using Cronbach's Alpha (α), Composite Reliability (CR) and Average Variance Extracted (AVE). Model-fit indices used were $\chi^2/df \leq 3.0$, CFI ≥ 0.90, TLI ≥ 0.90, and RMSEA ≤ 0.08.

3.5.3 Structural Model

Examined the direct effects of all independent variables to a dependent variable; To ensure data quality, Common Method Bias (CMB) was checked using Harman's single-factor test (Podsakoff et al., 2003), and multicollinearity was assessed through the Variance Inflation Factor (VIF < 3.3) as recommended by Kock (2015).

3.5.4 Data Screening and Respondent Profile

Data were collected from 85 valid responses out of a population of 567 ZPPRA employees. Screening procedures confirmed that, the dataset met the assumptions for SEM analysis. Missing data below 5% were replaced using mean substitution, and no severe outliers were detected ($p < 0.001$, Mahalanobis distance). All skewness and kurtosis values fell within the acceptable range of −2 to +2, indicating normality (Kline, 2016). Respondents were mainly professionals working in procurement and ICT departments, aged between 30 and 49 years, and holding bachelor's or postgraduate degrees. This composition indicated a qualified and experienced sample that accurately represents E-ProZ system users within ZPPRA.

3.6 Reliability and Validity of Constructs

Reliability and validity tests were conducted to confirm measurement consistency and construct adequacy. Cronbach's Alpha (α) and Composite Reliability (CR) values for all constructs exceeded the recommended threshold of 0.70, confirming internal consistency (Nunnally & Bernstein, 1994). The Average Variance Extracted (AVE) for all constructs was greater than 0.50, indicating sufficient convergent validity (Fornell & Larcker, 1981).

Table 2

Reliability and Validity of Constructs

Construct	Cronbach's Alpha	CR	AVE
Optimism	0.812	0.846	0.582
Innovativeness	0.798	0.831	0.559
Discomfort	0.751	0.784	0.519
Insecurity	0.767	0.805	0.541
E-Procurement Adoption	0.884	0.902	0.655

All tests met the minimum acceptable criteria, confirming that the measurement items were reliable and valid indicators of their respective constructs. Discriminant validity was also established using the Fornell–Larcker criterion, as the square roots of each construct's AVE exceeded the corresponding inter-construct correlations.

3.6.1 Model Fit Evaluation (CFA Results)

Confirmatory Factor Analysis (CFA) was performed to verify the overall measurement model. The results demonstrated an acceptable model fit, satisfying the standard indices recommended by Hair et al. (2021) and Kline (2016);

$\chi^2/df = 2.13$, **CFI = 0.93**, **TLI = 0.91**, and **RMSEA = 0.07**.

These values confirm that, the model adequately represents the relationships between the observed indicators and their underlying latent constructs, providing a sound basis for further structural analysis.

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3.6.2 Diagnostic Tests for Common Method Bias and Multicollinearity

Diagnostic checks were carried out because the study used self-reported data. Common technique bias was not a problem, according to Harman's single-factor test, which showed that only 38.7% of the total variance was explained by the first factor, below the 50% threshold (Podsakoff et al., 2003). The lack of multicollinearity was confirmed by Variance Inflation Factor (VIF) values, which varied from 1.21 to 2.76 and were below the crucial value of 3.3 (Kock, 2015).

3.7 Structural Model Results

After validating the measurement model, the structural model was estimated to test the hypothesized relationships between Technology Readiness dimensions (optimism, innovativeness, discomfort, and insecurity) and E-Procurement Adoption. The model achieved acceptable fit indices ($\chi^2/df = 2.29$, CFI = 0.93, TLI = 0.91, RMSEA = 0.074), confirming that the proposed model provided a good representation of the observed data.

Table 3

Structural Model Results and Hypothesis Testing

Hypothesis	Relationship	Estimate (β)	p-value	Decision
H1	Optimism - E-Procurement Adoption	0.312	0.012	Supported
H2	Innovativeness - E-Procurement Adoption	0.284	0.021	Supported
H3	Discomfort - E-Procurement Adoption	–0.261	0.037	Supported
H4	Insecurity - E-Procurement Adoption	–0.239	0.045	Supported

The model supported all four hypotheses ($p < 0.05$). The results suggested that, there is positive influence of optimism and innovativeness to E-ProZ system adoption, while discomfort and insecurity influenced adoption negatively. These findings provide empirical validation for the proposed theoretical model and form the basis for the ensuing discussion.

3.6 Ethical Considerations

Ethical clearance was obtained from relevant institutional authority. Respondents were informed about the purpose of the research, assured confidentiality and participation was strictly voluntary. No identifying information was collected and the data were used solely for academic purposes.

IV. FINDINGS & DISCUSSION

4.1 Findings

This section presents the study findings on the influence of technology readiness and its dimensions in e-procurement adoption at ZPPRA. The presented results followed the study's objectives, and is divided into two parts i.e. descriptive statistics which summarize respondents view per each construct and inferential statistics that test the hypothesized relationship between variables

4.1 Descriptive Statistics

The descriptive results summarized the respondents' perceptions of optimism, innovativeness, discomfort, insecurity, and overall e-procurement adoption, as shown in Table 4**.**

Table 4

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Optimism	70	2.10	5.00	3.94	0.71
Innovativeness	70	2.30	5.00	3.81	0.68
Discomfort	70	1.30	4.10	2.56	0.73
Insecurity	70	1.20	4.30	2.78	0.80
E-Procurement Adoption	70	2.20	4.90	3.87	0.65

As indicated in Table 4, optimism showed a mean score of (M = 3.94, SD = 0.71) and innovativeness (M = 3.81, SD = 0.68) of which were relatively high, suggesting that, most ZPPRA staff are willing to explore and utilize the E-ProZ system. Conversely, the mean scores for discomfort (M = 2.56, SD = 0.73) and insecurity (M = 2.78, SD = 0.80)

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were moderate, meaning that although some employees experience anxiety and uncertainty when using the system, these challenges are not significant.

Overall, the descriptive results indicate a generally favorable level of technology readiness among ZPPRA employees. The findings suggest that most users are confident and open to e-procurement adoption, although a small proportion still exhibit cautious attitudes due to limited ICT skills and perceived system risks.

4.2 Inferential Statistics

Inferential statistical analysis was conducted to test the hypothesized relationship between technology readiness dimensions and e-procurement adoption. The regression results illustrate the individual and collective effects of optimism, innovativeness, discomfort, and insecurity on E-ProZ system adoption, as summarized in Table 5.

Table 5

Inferential Statistics

Model	R	R^2	Adjusted R^2	Sts.Error	F-Statistic	Sign.
Technology Readiness Dimensions – E-Procurement Adoption	0.79	0.63	0.6	0.41	22.84	0

Overall, the model explains 63% ($R^2 = 0.63$) of the variance in e-procurement adoption, indicating that the four technology readiness dimensions collectively contribute significantly to the effective use of the E-ProZ system ($F = 22.84$, $p < 0.001$).This confirms that users' behavioral readiness is a key determinant of successful digital transformation within ZPPRA.

4.3 Discussion

The results of this study confirm that human readiness significantly influences the success of e-procurement adoption. High levels of optimism and innovativeness among employees indicate that users who are confident and open to new technologies are more likely to embrace the E-ProZ system. This is consistent with the findings of Aboelmaged (2010), Gunasekaran and Ngai (2018), and Mutua et al. (2024), who found that positive attitudes and creative behaviors promote technology adoption in public organizations.

Conversely, discomfort and insecurity were identified as factors that adversely impact the adoption of e-procurement. This indicates that when employees experience anxiety, lack skills, or feel uncertain about data security, they are likely to hesitate in fully utilizing the system. Similar observations have been made by Asogwa (2020), Ismail and Harun (2021), and Tsourela and Giaglis (2022), who highlighted that psychological obstacles and concerns about trust can diminish the utilization of technology in public procurement.

Overall, these results suggest that the achievement of e-procurement reform in Zanzibar relies not solely on the caliber of the technology but also on the readiness of users to interact with it. Thus, organizations ought to concentrate equally on skill enhancement, managerial transition, and belief cultivation among personnel to facilitate the lasting uptake of the E-ProZ system.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

Using the E-ProZ system as a case study, this study investigated the impact of Technology Readiness on E-Procurement Adoption at the Zanzibar Public Procurement Regulatory Authority (ZPPRA). The study was bolstered by Technology Readiness Index (TRI) and Technology-Organization-Environment (TOE) framework, which sought to ascertain how readiness dimensions of innovativeness, optimism, discomfort and insecurity affects the decision of adopting e-procurement systems. Additionally, Structural Equation Modeling (SEM) results showed a positive and significant influence of innovativeness and optimism to e-procurement adoption, while discomfort and insecurity exhibited negative-significant outcomes. Clearly, these results supported the theoretical premise of TRI model that adoption behavior is influenced by psychological preparedness. Furthermore, by connecting institutional and environmental factors that either support or obstruct digital transformation with person readiness, the integration of TRI and TOE frameworks offered a thorough explanation.

The study concluded that, when there is strong base of institutional and human readiness factors, technological reforms in public procurement can succeed. While sophisticated systems like E-ProZ can improve accountability, transparency and efficiency, their advantages can only be realized when institutions have robust enabling policies, regulatory authority, and infrastructure, as well as when users are self-assured, creative, and well-trained. This study offered empirical proof that technology adoption in Zanzibar is a behavioral and organizational issue in addition to a

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technical one. From a practical standpoint, it illustrates how the viability of e-procurement reforms in Zanzibar is determined by a combination of user views, institutional commitment and environmental constraints.

5.2 Recommendations

Based on the study's findings, number of suggestions are put forth to improve the Zanzibar Public Procurement Regulatory Authority (ZPPRA) and the public sector's overall adoption and use of e-procurement technologies. These suggestions fall into two categories i.e. policy-level recommendations and institutional and management recommendations. It is advised that, ZPPRA should strengthen capacity building programs and training especially ICT's at both institutional and managerial levels. Also, to increase the employee's digital literacy, self awareness and familiarity with E-ProZ system in keeping pace with ongoing trainings are crucial. In addition to enhancing technical proficiency, regular refresher training and on-the-job mentoring can help users who might find it difficult to use new technologies feel less uneasy and insecure.

Additionally, management must to encourage an innovative culture within the company. A more encouraging environment for digital transformation can be created by encouraging staff members to try out new system features, exchange success stories and participate in innovation-driven forums. Greater levels of technology adoption and continuing development will result from commending and acknowledging inventive personnel for their favorable perspectives toward system utilization, particularly optimism and innovativeness.

ZPPRA should also prioritize and support system stability, reducing operational frustration by lessening operational frustration demands technological advancements like sustaining a dependable internet link, updating systems on a timetable, and establishing an around-the-clock support desk. These efforts will ensure seamless, continuous acquisition streams and diminish buyer frustration. Data assurance and system protections also warrant keen attention. ZPPRA ought to implement enhanced network defense measures, such as tiered authentication, secure information storage techniques, and regular platform assessments, to alleviate customer concerns regarding data security and confidentiality. By alleviating worries and increasing buyer confidence, these measures will ultimately enhance trust in the e-procurement system. The Zanzibar administration should ensure that institutional readiness and digital monitoring protocols are aligned at the policy level. Adequate staff capability, robust ICT infrastructure and comprehensive transition management systems for e-procurement's successful implementation must drive technology investment. The benefits of digital progress may not be realized without such alignment. Furthermore, policymakers should develop incentive mechanisms to support the adoption and utilization of e-procurement tools. These structures could involve performance-based recognition, dedicated funding for ICT improvements, or linking platform usage to evaluation systems. These actions will not only encourage entities to fully embrace e-procurement but will also foster a climate of continuous improvement, transparency, and innovation in public procurement across Zanzibar.

REFERENCES

Aboelmaged, M. G. (2010). Predicting e-procurement adoption in a developing country: An empirical integration of technology acceptance model and theory of planned behavior. *Industrial Management & Data Systems, 110*(3), 392–414. https://doi.org/10.1108/02635571011030042

Asogwa, B. E. (2020). Electronic government in developing countries: Development and diffusion of e-government applications in Nigeria. *Government Information Quarterly, 37*(2), 1–10. https://doi.org/10.1016/j.giq.2019.101432

Bakar, N. A., Omar, S. S., & Nurdin, N. (2020). E-procurement adoption and implementation in developing countries: A case of Tanzania. *International Journal of Public Sector Management, 33*(4), 389–408. https://doi.org/10.1108/IJPSM-07-2019-0186

Basheka, B. C., & Bisangabasaija, E. (2019). Determinants of adoption of e-procurement practices in public sector: Evidence from Uganda. *Journal of Public Procurement, 19*(3), 231–252. https://doi.org/10.1108/JOPP-12-2018-0062

CAG. (2023). *Report of the Controller and Auditor General on public procurement for FY 2022/2023*. Government of Zanzibar.

Croom, S., & Brandon-Jones, A. (2017). Key issues in e-procurement: Procurement transformation and e-business. *Journal of Purchasing and Supply Management, 23*(4), 203–210. https://doi.org/10.1016/j.pursup.2017.08.002

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Licensed Under Creative Commons Attribution (CC BY-NC)

Gichuki, C., & Were, S. (2023). Barriers to successful e-procurement implementation in Sub-Saharan Africa: A systematic review. *African Journal of Management Research, 15*(2), 44–59.

Gunasekaran, A., & Ngai, E. W. T. (2018). Adoption of e-procurement in the public sector: An empirical study. *International Journal of Production Economics, 200*, 83–95. https://doi.org/10.1016/j.ijpe.2018.03.007

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2021). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hassan, M., & Mungai, P. (2022). Organizational and technological determinants of e-procurement adoption among state agencies in Kenya. *African Journal of Business Management, 16*(6), 119–131.

Ismail, Z., & Harun, M. (2021). Contextualizing e-procurement frameworks for developing countries: Lessons from Malaysia. *Asian Journal of Technology Innovation, 29*(3), 385–403. https://doi.org/10.1080/19761597.2021.1959421

Kline, R. B. (2016). *Principles and practice of structural equation modeling* (4th ed.). The Guilford Press.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1–10. https://doi.org/10.4018/ijec.2015100101

Mambo, P., & Muriithi, S. (2020). Barriers to e-procurement implementation in Sub-Saharan Africa: A systematic perspective. *International Journal of Production Economics, 150*, 95.

MAPS. (2023). *Zanzibar public procurement system assessment: Methodology for assessing procurement systems (MAPS) report 2023*. World Bank Group & Government of Zanzibar.

Mlinga, R., & Lameck, W. (2021). Public procurement reforms and e-procurement adoption in Tanzania: Progress and challenges. *Journal of Marketing Research, 19*(1), 39–40.

Moshi, E., & Komba, H. (2023). Evaluating the effectiveness of electronic procurement systems in Zanzibar public institutions. *African Journal of Management and Governance, 11*(1), 33–48.

Msuya, M., & Malongo, J. (2022). Assessing the challenges of e-procurement implementation in public institutions in Tanzania. *International Journal of Public Administration and Management Research, 8*(2), 45–59.

Mutua, J. K., Mwangi, M., & Wambugu, G. (2024). Technological readiness and digital transformation in public procurement: Evidence from Kenya. *Journal of African Digital Economy, 3*(1), 67–82.

Neupane, A., Soar, J., & Vaidya, K. (2012). Evaluating the anti-corruption capabilities of public e-procurement in a developing country. *The Electronic Journal of Information Systems in Developing Countries, 55*(1), 1–17. https://doi.org/10.1002/j.1681-4835.2012.tb00373.x

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

OECD. (2016). *OECD recommendations on public procurement*. Organisation for Economic Co-operation and Development. https://doi.org/10.1787/9789264264026-en

Oliveira, T., & Martins, M. F. (2011). Literature review of information technology adoption models at firm level. *The Electronic Journal Information Systems Evaluation, 14*(1), 110–121.

Oyeyemi, T. A., Lawal, A. M., & Ajayi, A. O. (2023). E-procurement readiness and institutional performance in Sub-Saharan Africa: A behavioral perspective. *Journal of African Governance and Development, 9*(2), 77–91.

Parasuraman, A. (2000). Technology readiness index (TRI): A multiple-item scale to measure readiness to embrace new technologies. *Journal of Service Research, 2*(4), 307–320. https://doi.org/10.1177/109467050024001

Parasuraman, A., & Colby, C. L. (2015). An updated and streamlined technology readiness index: TRI 2.0. *Journal of Service Research, 18*(1), 59–74. https://doi.org/10.1177/1094670514539730

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Rahayu, R., & Day, J. (2017). E-commerce adoption by SMEs in developing countries: Evidence from Indonesia. *Eurasian Business Review, 7*(1), 25–41. https://doi.org/10.1007/s40821-016-0044-6

Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.

Tsourela, M., & Giaglis, G. M. (2022). Assessing technology readiness in public organizations: Antecedents and consequences. *Government Information Quarterly, 39*(2), 101625. https://doi.org/10.1016/j.giq.2021.101625

UNCTAD. (2020). *E-government survey 2020: Digital government in the decade of action for sustainable development*. United Nations Conference on Trade and Development.

URT. (2020). *The Zanzibar Public Procurement and Disposal of Public Assets Act, No. 11 of 2025*. Government Printer.

Vaidya, K., Sajeev, A. S. M., & Callender, G. (2016). Critical factors influencing e-procurement adoption in the public sector. *Journal of Public Procurement, 16*(3), 254–278. https://doi.org/10.1108/JOPP-03-2015-0012

World Bank. (2021). *Tanzania: Enhancing public procurement performance through e-procurement reform*. https://doi.org/10.1596/978-1-4648-1712-0

ZPPRA. (2020). *The Zanzibar Public Procurement and Disposal of Public Assets Regulations, 2020*. Zanzibar Public Procurement Regulatory Authority.

ZPPRA. (2024). *Annual procurement report 2023/2024*. Zanzibar Public Procurement Regulatory Authority.

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Consequences of women group leadership competencies in enforcing illegal alcohol control policy in Nandi North Sub-county, Kenya

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ABSTRACT

Alcohol consumption, despite the present legislative frameworks, remains a severe social and socioeconomic challenge in Kenya. This research investigated the influence of the group leadership skills of women on the manner in which the illegal alcohol control program was enacted in Kenya in the Nandi North Sub-County. This research used a convergent parallel mixed-methods design, which was grounded on agency and empowerment theories. The sample size of the respondents was selected as 258 respondents, based on the target population of 881 stakeholders, comprising residents, community leaders, enforcement officers, and the members of women's groups in purposive and systematic random sampling. Data were collected using semi-structured interviews, focus groups, and structured questionnaires. Thematic content analysis was used to analyze the qualitative data, whereas SPSS version 17.0 was used to analyze the quantitative data through multiple regression analysis and descriptive statistics. The findings indicated that the leadership potential of women's groups was also of a significant predictive ability of the efficacy of policy implementation (R^2=0.551, F(4,145)=18.367, p<0.001). Resource mobilization (b=0.291, p=0.004), advocacy and sensitization (b=0.352, p=0.003), leadership decision-making (b=0.418, p=0.001), and monitoring and accountability (b=0.267, p=0.004) were also significantly beneficial. The qualitative study found out that collaborative strategies, including joint lobbying campaigns (68%), regular coordination meetings (79%), community sensitization programs (82%), and collaborations with local authorities (86%), enhanced policy implementation outcomes. Based on the findings of the study, group leadership by women is a useful, though under-explored, resource in executing policies at the grassroots level. In an effort to enhance the sustainability and effectiveness of community-based treatment, the policy frameworks are supposed to recognize women's organizations as valuable players in alcohol control programs and offer them adequate funding, capacity building, and integration in institutions.

Keywords: Community-Based Implementation, Illicit Alcohol Control Policy, Nandi North Sub-County, Policy Effectiveness, Women Group Leadership Capabilities

I. INTRODUCTION

Worldwide, alcohol consumption is a serious public health concern, with low- and middle-income nations being especially affected. According to estimates from the World Health Organization [WHO] (2018), about 25% of alcohol consumption worldwide goes unreported; in developing countries, where illegal manufacture flourishes due to lax regulatory enforcement, financial incentives, and cultural acceptance, this percentage is significantly higher. Illicit alcohol has become a significant development concern in sub-Saharan Africa, contributing to economic losses, gender-based violence, family dissolution, and avoidable mortality (Bryceson, 2002). According to Lelei et al. (2022), illicit brews accounted for the highest proportion of alcohol seizures in Kenya during the first half of 2020, highlighting the widespread prevalence of illegal alcohol consumption. The brief confirms that alcohol remains the most widely used substance in the country, indicating extensive consumption of both licit and illicit products.

Despite the existence of the Alcoholic Drinks Control Act, 2010, and other national laws aimed at regulating the production, distribution, and consumption of alcoholic beverages, enforcement continues to face significant challenges, particularly at local levels where illegal brewing operations persist. The Rift Valley region of Kenya's Nandi North Sub-County is a prime example of these implementation difficulties. The region is known for its abundant agricultural potential, with the main drivers of the local economy being the production of tea and maize. However, serious alcohol-related issues coexist with this agricultural prosperity. According to National Authority for the Campaign Against Alcohol and Drug Abuse [NACADA] (2022), illicit alcohol-related problems, like as economic hardship, domestic violence, and health problems from toxic brews, directly impact about 38% of families in Nandi North.

According to data from Kariuki, et al. (2013) families afflicted by alcohol have average family incomes that are 25% less than the regional norm, which feeds poverty cycles. While community leaders claim an increase in domestic violence episodes connected to substance misuse, local health institutions routinely receive cases of alcohol poisoning. Communities' social fabric has been stressed, and the weight of alcohol-related issues has caused conventional support

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networks to erode. Comprehensive regulatory measures, including as license requirements, quality standards, limited trading hours, and sanctions for infractions, were introduced under the Alcoholic Drinks Control Act (2010). National policies place a strong emphasis on a multi-sectoral strategy that includes community involvement, health services, and law enforcement. However, in Nandi North and other such situations, traditional enforcement tactics have not worked. Illicit brewing activities are only momentarily disrupted by police raids; output quickly resumes after enforcement measures end (Were, 2021). Challenges for court prosecutions include judicial backlogs, witness intimidation, and evidence gathering. Because of their financial reliance, skepticism of the government, or sense of camaraderie, community members frequently defend brewers, undermining official enforcement measures. Alternative strategies, especially community-based initiatives run by formal civil society organizations, have gained traction as a result of these implementation gaps. Because alcohol addiction disproportionately affects women and families, women's organizations have become especially engaged in attempts to reduce alcohol consumption.

In Nandi North, women have suffered greatly from the effects of illegal alcohol, including increased caregiving responsibilities, financial hardship when male household heads waste their income on alcohol, domestic violence, and unstable families. Women's organizations have responded by organizing to combat these issues head-on through direct confrontation of brewing operations, family support programs, advocacy for more stringent enforcement, and awareness campaigns. Collective decision-making processes that guarantee widespread participation; resource mobilization strategies that pool financial, material, and social capital; advocacy tactics that increase awareness and shape community attitudes; and accountability mechanisms that uphold organizational integrity and community trust are just a few of the leadership qualities that these grassroots organizations possess and should be carefully examined. Despite these proven qualities, women's contributions to formal policy implementation institutions are still mostly unrecognized and primarily informal.

1.1 Statement of the Problem

The production, sale, and consumption of illicit brew in Nandi North Sub-County, Kenya is an issue regardless of the enactment of the Alcoholic Drinks Control Act (2010) and National Policy on Control of Alcohol and Substance Abuse. NACADA (2022) considers illicit alcohol-related problems to be about 38 percent of households in the sub-county. Among the recorded effects are reports of alcohol poisoning which requires medical intervention, rise in instances of domestic violence, loss of household income, on average, 25 percent below the regional averages, and social disintegration reducing community cohesion (County Government of Nandi, 2021). These issues are not resolved despite the existing policies, which implies that there is a problem with their implementation. The conventional enforcement acts, such as police raid and court proceedings, have failed and merely resulted in temporary disruptions without fixing the cause-and-effect of the demand factors and supply chains (Were, 2021). Community opposition to state-enforced policies is also a weakness of the policy as it is provided with the lack of trust towards authorities and economic reliance on the alcohol business. These implementation problems are the weakness of the state-centric, top-down approaches and indicate that more alternatives, which are community-based, are needed.

Women groups in Nandi North have been the active participants in the alcohol control efforts through awareness programs, family support services, enforcement advocacy, and direct face-to-face confrontation of illegal brewing activities. Their experience of the disproportional impact of domestic violence, alcohol abuse, poverty, and increased caregiving burden motivates them. Such groups exhibit leadership features such as the collective decision- making process, mobilization of resources, advocacy and accountability processes. Their input though remains unofficial, under-recognized within official policy systems, and unsubstantiated by institutional processes and resource allocation. The inability to pursue policy objectives through community-based social capital is a lost opportunity, which is symbolized by the inability of the women organizations to be considered in the process of the official policy implementation. No empirical research specifically focuses on women group leadership abilities in illicit alcohol control policy-making and rural Kenyan context, although the literature provides an appreciation of women leadership in other development setups (Eagly and Carli, 2018), and the significance of community involvement in the policy implementation process in general (Gaventa & Cornwall, 2004).

This gap was filled by this study since it focused on determining the extent to which women group leadership potential, that is, their decision-making processes, resource mobilization processes, advocacy and sensitization processes, and monitoring and accountability processes, affect the effectiveness of the implementation of the illicit alcohol control policy in Nandi North Sub-County. The insight into these relationships can be useful in policy reforms that officially involve community-based actors in the implementation structures and enhance the effectiveness of the policies and the power of the marginalized communities.

1.2 Research Hypothesis

H_0: Women group leadership capabilities have no significant implications in the implementation of the illicit alcohol control policy in Nandi North Sub-County, Kenya.

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Although the null hypothesis was developed to address the quantitative part of the research in order to evaluate whether the relationship between the capability of women group leadership and the policy implementation outcomes was statistically significant, the study used the mixed-methods approach. This was supplemented by the qualitative strand which ventures into how and why these quantitative relationships are the case and gives more details about the contextual, social and institutional processes that affect the role of women in the implementation of illicit alcohol control policies. This integration was what made sure that a more understanding was obtained concerning both quantifiable effects and qualitative opinions.

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Agency Theory

This study is based on the agency theory that was initially developed in the field of organizational economics by Jensen and Meckling (1976) and then adjusted to apply to policy research. Agency signifies the ability of individuals and organizations to take independent actions, decisions and determine outcomes despite the structural and institutional limitations (Bandura, 1989; Eisenhardt, 1989). The agency theory examines the role of other actors other than the officially appointed implementers in influencing policy processes and outcomes in policy environments.

In the case of women, group action is the agency that works with group action, whereby there is coordinated collaboration to create capacities which are more than those of individuals operating on their own. These capabilities are created through coordinated action, networks of mutual support and strategic interaction with the structures of power. Women are limited in their formal political participation by the gender norms but their social role as family welfare managers and caretakers give them the right to voice their concerns about the adverse impacts of alcohol on families and the society (Eagly & Wood, 2012).

Therefore, the agency theory can provide a conceptual paradigm towards understanding the way in which even when marginalized actors are excluded in the formal systems, they are likely to affect the governance processes. It puts an analytical emphasis on how organizations of women have influence, the mechanisms of advocacy, mobilizing of resources, decision-making, accountability of organizations, and how these abilities lead to the outcomes of the implementation of policies.

2.1.2 Empowerment Theory

Empowerment theory complements the agency theory and describes the process of the marginalized groups acquiring the power to influence their environment. To Rappaport (1981), empowerment is a procedure of gaining control over a situation and its outcome. Kabeer (1999) made this notion better and identified three interrelated dimensions achievements (the outcomes of exercising agency), agency (the power to make decisions and negotiate), and resources (material, human and social resources).

There are social, political, and economic aspects of women empowerment of their organizations. Income-generating activities provide financial resources and create spaces of collective organization, which empowers the economies with economic power. Social empowerment increases by joining groups, forming networks, solidarity and shared identity that fight the individual isolation. The more vocal and influential the groups are in the government processes the more they become active participants in policy making rather than being passive subjects in the policies thus, becoming political players.

These dimensions operate in loops of reinforcement, in that economic assets make possible the existence of social organization, social networks enable political engagement, and additional resources are accessible through political power. In conceptualizing empowerment as a dynamic process that is complex in nature, the concept of women organizations forming and utilizing leadership capacities that are significant to policy implementation, and the ability to enhance these capacities can empower groups and enhance the success of policies.

2.2 Empirical Literature Review

Research on women leadership within the community setting underlines that women tend to employ relations, involvement and coalition approaches as opposed to hierarchy. According to Hassan and Silong (2008), the female leaders are inclusive, consensus building and capacity developing so that their members are engaged and become proprietors of projects in the community. In the same vein, Eagly and Carli (2018) emphasize the role of women in working around structural impediments, in which they form coalitions and control influence by the use of relationship-based leadership. Northouse (2025) builds on this insight by locating the practices of women leadership in a wider theoretical framework demonstrating that participatory and transformational leadership styles are useful in community development since they capitalize on the social capital and collective responsibility. Despite these studies concurring on the significance of participatory leadership, they do not concur on how effectiveness is explained. Hassan and Silong also identify culture legitimacy and community trust as a source of success, whereas Eagly and Carli emphasize on

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versatility and strength in breaking gender-limited boundaries. Northouse combines the two perspectives by claiming that the result of leadership is contingent on the ability of leaders to match the competencies on one hand with the situational needs. All these studies together indicate that the leadership of women plays a role in prolonged community development whereby participatory activities are solidified through adaptive strategies that react to situational pressures.

Studies of alcohol control intervention have shown the possibility as well as difficulties of community participation. According to Babor (2010), formal regulation of alcohol use should be accompanied by community-based prevention and awareness programs with the aim of ensuring that alcohol is managed effectively. According to Kalema et al. (2015), community mobilization in Uganda associated with education and treatment programs led successfully to a decrease in harmful drinking patterns, but the results were difficult to maintain due to the lack of funding after the external sources stopped. Lawhon and Herrick (2013) analyzed the experience of alcohol control in South Africa and found that the effectiveness of alcohol control policies can be determined by the quality of the policy coverage in the media and the perception of the community to the use of interventions. Gitatui et al. (2019) offers a Kenyan lens with a case study of women-led anti-alcohol movements in Kawangware where mobilization of the locals, enforcing actions and sensitizing on alcohol abuse issues minimized the alcohol abuse in the community. Nevertheless, these attempts were met with opposition by people who were economically reliant on the illegal brewing industry. In comparison to the Kalema et al., the study conducted by Gitatui et al. brings out a closer enforcement by women though with higher risks of confrontation. The insights provided by Babor at the policy level put an emphasis on the institutional design, but the local studies show that the cultural, economic, and gendered aspects of the community-based alcohol control success. Combining the results, the community participation is seen to contribute to ownership and impact, yet sustainability, and collaboration with formal authorities are seen as key issues.

Some of the obstacles that can hinder policy implementation in Kenya include lack of proper funding, poor coordination and political interferences. According to Kabeer (2005), these restrictions in governance are linked to gender inequities that undermine the contribution of women during the development process. The African alcohol-control evidence points to the fact that the women groups can fill the policy gaps by ensuring the community presence, offer local enforcement feedback, and initiate communal support. The literature depicts significant differences when comparing them within contexts. Women groups in Uganda and Kenya will cover the vacuum created by the ineffective government control, and in South Africa the efficacy of the control on alcohol consumption is dependent upon the public discourse and political framing. As it is evidenced in the Kenyan experiences of Gitatui et al. (2019) it is possible to say that women groups can effectively decrease alcohol-related harms on the community level but it is impossible due to the lack of the institutional recognition and financial support in the long term. Kalema et al. (2015) and Lawhon and Herrick (2013) also demonstrate that even though community mobilization provides instant outcomes, sustainability dictates the need to incorporate community strategies into the official policy frameworks.

The comparative synthesis of existing literature demonstrates that female leadership and negative intervention of communities are the key to attaining positive results in development and alcohol control. Yet, not many studies have integrated quantitative evaluation of the results of policy implementation, as well as qualitative investigation of the leadership processes under one research design. The majority of Kenyan research, including Gitatui et al. (2019), includes descriptive information, but does not measure policy effects in a systematic way, whereas the larger scale policy studies such as those of Babor (2010) and Kabeer (2005) do not consider localized gendered leadership processes. This gap points to the necessity of combined research to both measure the effects and explain the situation on the ground. The study at hand responds to this requirement by relying on a mixed-method design in order to examine the association between the capabilities of women group leadership and the application of illicit alcohol control policy within the Nandi North Sub-County. It is a mixture of quantitative data on the effectiveness of the policy and the qualitative data about the impact of the practices of women leadership, challenges, and interactions with the community on the outcomes. The research therefore adds to the heightened understanding of the role of women leadership in aiding the execution of community-based policy programs in Kenya.

III METHODOLOGY

3.1 Research Design

In order to provide a thorough grasp of the research problem, the study used a convergent parallel mixed methods design, concurrently gathering and integrating quantitative and qualitative data (Creswell & Plano Clark, 2017). A cross-sectional survey examining the connections between women's group leadership skills and policy implementation outcomes was used in the quantitative strand. The qualitative strand used focus groups and semi-structured interviews to explore lived experiences and perceptions phenomenologically. Combining the two methods allowed for triangulation of results, capturing subtle contextual elements and mechanisms while offering statistical support for connections.

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3.2 Study Area

The study was carried out in Nandi North Sub-County, which is part of Nandi County in the Rift Valley region of Kenya. The sub-county is made up of Kipkaren, Mosop, Kabiyet, and Chepteriwai, among other administrative divisions. The region is known for its ideal growing circumstances, which make growing maize and tea the main sources of income. Notwithstanding the potential for economic growth, illicit alcohol-related issues affect about 38% of households (NACADA, 2022). The documented effects of these issues include health issues, domestic violence, and economic deprivation, which lower average household incomes by 25% below regional averages (County Government of Nandi, 2021). Active women's organizations in the sub-county are involved in a range of socioeconomic endeavors, including as community development projects, microfinance programs, and agricultural cooperatives. Since these organizations have been more active in the fight against illegal alcohol, Nandi North is a suitable location to study the leadership potential of women's groups in enforcing policies.

3.3 Target Population

The target population consisted of 881 stakeholders who were divided into five groups: 30 women's groups with about 300 members actively involved in illegal alcohol control activities; 50 community leaders (chiefs, assistant chiefs, village elders) who were knowledgeable about the dynamics of policy implementation; 30 local enforcement officials (police officers, county enforcement officers) who were in charge of enforcing the policy formally; 1 sub-location administrator who provided administrative oversight; and 500 residents who were directly or indirectly impacted by illegal alcohol and who were watching women's group activities. With women's groups as the main actors, authorities as the official implementers, and community people as the beneficiaries and observers of implementation efforts, this multi-stakeholder model guaranteed thorough understanding from a variety of viewpoints.

3.4 Sample Size and Sampling Procedure

Sample size was determined using Yamane's (1973) formula:

$n = N / [1 + N(e)^2]$

Where: n = sample size, N = population size (881), e = margin of error (0.05)

A minimum sample of 239 responders was obtained as a result. In order to account for any non-responses, the study eventually attracted 258 respondents, who were divided as follows:

Table 1: Distribution of the Sample Size by Respondent Category

Respondent Category	Population	Sampling Technique	Sample Size
Women Groups	30	Purposive	30
Women Group Members	300	Purposive	78
Community Leaders	50	Purposive	30
Local Enforcement Officials	30	Purposive	20
Households/Residents	500	Systematic Random	100
Total	**880**		**258**

Purposive sampling was used for women groups, group members, community leaders, and local enforcement officials because these categories possessed specific knowledge and experiences relevant to the study objectives. Their inclusion ensured that information collected was rich, detailed, and directly related to the topic under investigation. On the other hand, systematic random sampling was employed to select households or residents to ensure equal representation of the general community and minimize selection bias. This mixed approach enhanced the validity and representativeness of the study findings.

3.5 Research Instruments

3.5.1 Structured Questionnaires

Women group members, community leaders, law enforcement officers, and respondents from households were given structured questionnaires that included both closed-ended and open-ended questions. Five sections made up the questionnaires: demographic data (age, gender, education, and occupation); leadership skills of women's groups (decision-making, resource mobilization, advocacy, and monitoring mechanisms); collective action strategies (coordination, collaboration, and challenges); results of policy implementation (reductions in the production of illicit alcohol, community awareness, and enforcement effectiveness); and contextual factors affecting implementation.

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3.5.2 Semi-Structured Interview Schedules

To collect detailed qualitative information, semi-structured interviews were performed with community leaders, law enforcement officers, and female group leaders. Open-ended questions in interview guides covered topics such as leadership roles and responsibilities in alcohol control initiatives, decision-making processes both within groups and in interactions with authorities, resource mobilization tactics and obstacles, advocacy and sensitization strategies, monitoring and accountability systems, opinions on the efficacy of policy implementation, and suggestions for improving women's leadership contributions in groups.

3.5.3 Focus Group Discussion Guides

Eight to twelve women participated in focus groups that examined common viewpoints, group dynamics, and collective experiences. Discussion guides covered the following topics: group leadership skills, teamwork tactics, difficulties implementing policies, connections with authorities and community people, and opinions on how well a group is doing at decreasing problems related to illicit alcohol. To reduce language barriers and improve participant comfort and comprehension, all instruments were translated into Kiswahili and Kalenjin, the native tongue.

3.6 Data Collection Procedures

After receiving ethical permissions, data collection took place over a period of eight weeks. In order to gain cooperation and explain the study, researchers first spoke with community leaders. After that, women's organizations were approached, and their leaders assisted in recruiting new members. In order to ensure understanding and completeness, questionnaires were distributed through in-person interviews. Semi-structured interviews lasted 45–60 minutes, were recorded on audio with permission, and were held in quiet settings to maintain confidentiality. Focus group talks, which lasted 90 to 120 minutes and were audio recorded with everyone's permission, took place in familiar community locations. Following an explanation of the study's goals, methods, risks, rewards, and their freedom to withdraw at any time without facing repercussions, each participant gave signed informed permission. During data collection sessions, no incentives other than light refreshments were offered.

3.7 Data Analysis

SPSS version 17.0 was used to code, clean, and enter quantitative data. The characteristics of respondents, the leadership capacities of women's groups, and the results of policy implementation were described by descriptive statistics (frequencies, percentages, averages, and standard deviations). The effectiveness of policy implementation (dependent variable) and leadership capability aspects (independent variables: advocacy/sensitization, monitoring/accountability, resource mobilization, and decision-making) were compared using multiple regression analysis. The threshold for statistical significance was set at $p<0.05$.

Thematic content analysis was used to examine qualitative information from focus group recordings and interview transcripts. Transcription of audio recordings, preliminary reading for familiarization, coding of significant passages, grouping codes into themes, spotting trends and connections between themes, and analyzing themes in light of theoretical frameworks and research goals were all part of this process. Quantitative data were contextualized, explained, and enhanced by qualitative discoveries.

3.8 Validity and Reliability

Three political science and public policy faculty members evaluated the instrument's comprehensiveness, relevance, and clarity in order to establish content validity. Instruments were improved based on their input. A pilot research with 30 respondents in the nearby Chesumei Sub-County, which has comparable sociodemographic features, was used to evaluate reliability. All of the scales' Cronbach's alpha coefficients (decision-making $\alpha=0.78$; resource mobilization $\alpha=0.75$; advocacy/sensitization $\alpha=0.81$; monitoring/accountability $\alpha=0.77$) above the acceptable threshold of 0.70, suggesting satisfactory internal consistency. Minor instrument improvements that improved clarity were prompted by pilot feedback.

3.9 Ethical Considerations

The National Commission for Science, Technology, and Innovation (NACOSTI) granted research license, and the Kenyatta University Ethics Review Committee provided ethical approval. After being fully informed about the study's goals, methods, possible risks and rewards, confidentiality safeguards, and their opportunity to withdraw at any time without incurring penalties, all participants gave their signed informed permission. Although sensitivity was maintained for possibly traumatic experiences with alcohol-related consequences, no vulnerable populations were expressly addressed.

Secure data storage, limited access, and anonymous coding were used to preserve data confidentiality. Ethics training for research assistants focused on participant distress management, confidentiality, and respect. To prevent

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compulsion, no incentives other than refreshments were offered. By using appropriate attribution, quoting, and paraphrase techniques, plagiarism was avoided, and the manuscript's Turnitin similarity index was less than 20%.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

Out of the 258 surveys that were sent out, 246 were returned, yielding a 95.3% response rate.Of these, 234 (90.7% usable response rate) were complete and appropriate for analysis. All 15 targeted interviews and the four scheduled focus groups, each with eight to twelve participants, were finished. Strong community interest in the research issue and successful mobilization by women's organizations and local leaders are indicated by this high response rate.

Table 2

Response Rate

Description	Frequency (n)	Percentage (%)
Questionnaires Distributed	258	100
Questionnaires Returned	246	95.3
Usable Questionnaires for Analysis	234	90.7

4.2 Demographic Characteristics

Table 3 presents selected demographic characteristics of the study variable. These include age groups, educational level and occupation.

Table 3

Demographic Characteristics of Respondents (N = 234)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Women	159	68
	Men	75	32
Age Groups	21–30 years	42	18
	31–40 years	98	42
	41–50 years	65	28
	Above 50 years	28	12
Education Level	Primary	72	31
	Secondary	103	44
	Tertiary College	42	18
	University	16	7
Occupation	Small-scale farming	122	52
	Petty trading	56	24
	Casual labour	30	13
	Formal employment	26	11

As shown in Table 3, 68% of respondents were women and 32% were men, which reflects the study's emphasis on women's groups and the inclusion of male family representatives, law enforcement officers, and community leaders who offered a range of viewpoints.

The respondents were between the ages of 21 and 67 (M=38.5, SD=11.2). The age group of 31–40 years old accounted for the biggest percentage (42%) followed by 41–50 years old (28%), 21–30 years old (18%), and above 50 years old (12%). This distribution shows that a significant portion of participants are from economically active age groups that are directly impacted by alcohol-related issues.

There were differences in educational attainment: just 31% had completed primary school, 44% had completed secondary school, 18% had attended tertiary college, and 7% had attended university. This distribution includes enough individuals with higher education to provide technical skills and leadership in women's groups, while also reflecting patterns of educational access in rural areas.

Small-scale farming accounted for 52% of the total professions, followed by petty trading (24%), formal employment (11%), and casual labor (13%). This is supported by Theuri and Nzioka (2021).who observed that occupational profile describes the rural economic environment and indicates that women's groups are primarily small-scale farmers and traders who have a direct interest in the financial well-being of their households, which is impacted by alcohol consumption.

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4.3 Illicit Alcohol Control Policy Implementation Outcomes (Dependent Variable)

Policy implementation effectiveness was measured through five key indicators assessed on 5-point Likert scales (1=strongly disagree to 5=strongly agree).

Table 4

Illicit Alcohol Control Policy Implementation Indicators

Indicator	Mean	Std. Dev.	Interpretation
Reduction in number of illicit brewing sites	3.72	0.89	Moderate improvement
Decrease in alcohol-related health cases	3.58	0.94	Moderate improvement
Reduction in domestic violence incidents	3.81	0.87	Substantial improvement
Increased community awareness of alcohol harms	4.12	0.76	Substantial improvement
Improved enforcement cooperation	3.45	1.02	Moderate improvement
Overall Policy Implementation Index	**3.74**	**0.7**	**Moderate-Substantial**

Source: Field Data, 2025

The overall policy implementation effectiveness index (M=3.74, SD=0.70) indicates moderate to substantial perceived effectiveness. Community awareness showed the highest rating (M=4.12), suggesting women's groups have been particularly successful in sensitization efforts. Reduction in domestic violence (M=3.81) and illicit brewing sites (M=3.72) also showed notable improvements. Enforcement cooperation, while positive, showed the lowest rating (M=3.45) and highest variability (SD=1.02), suggesting inconsistent relationships between women's groups and formal authorities.

Qualitative data provided context for these findings. A woman group leader explained: "*When we started, there were brewing dens in almost every village. Now they are fewer, and people know to report them. Our monthly awareness campaigns have changed attitudes—people now see illicit alcohol as harmful, not just entertainment.*"

An enforcement official noted: "*Working with women's groups has improved our intelligence. They know the community and can identify brewing sites we would never find. However, cooperation varies depending on the individual officers and group leaders involved.*"

4.4 Women Group Leadership Capabilities (Independent Variables)

Four dimensions of women group leadership capabilities were assessed as presented in Table 5.

Table 5

Women Group Leadership Capabilities

Leadership Capability Dimension	Mean	Std. Dev	Level
Leadership Decision-Making			
Inclusive participation in decisions	4.23	0.71	High
Strategic planning for alcohol control	3.87	0.85	High
Conflict resolution within groups	3.92	0.79	High
Delegation of responsibilities	3.78	0.88	High
Dimension Average	**3.95**	**0.65**	**High**
Resource Mobilization			
Financial resource generation	3.65	0.91	Moderate-High
Material resource acquisition	3.52	0.87	Moderate-High
Social capital leveraging	3.89	0.76	High
External partnership development	3.41	0.95	Moderate
Dimension Average	**3.62**	**0.73**	**Moderate-High**
Advocacy and Sensitization			
Community awareness campaigns	4.18	0.68	High
Cultural appropriateness of messages	4.05	0.74	High
Sustained engagement efforts	3.86	0.82	High
Use of diverse communication channels	3.72	0.89	Moderate-High
Dimension Average	**3.95**	**0.69**	**High**
Monitoring and Accountability			
Regular progress tracking	3.67	0.86	Moderate-High
Transparent reporting to members	3.88	0.79	High
Documentation of activities	3.54	0.92	Moderate-High
Accountability to community	3.91	0.77	High
Dimension Average	**3.75**	**0.72**	**High**

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Overall, the results of the leadership abilities and teamwork strategies provide a powerful and consistent trend that has been well-grounded by previous literature. The groups of women are very competent in participatory decision-making, community advocacy, and accountability, which are identified in the literature as the strengths of community initiatives led by women. Meanwhile, the average results of external resource mobilization indicate the well-reported structural constraints of gendered community leadership situations. These combined observations affirm that women groups in Nandi North Sub-County have the leadership capabilities to propel community-based alcohol control but they have systemic challenges like those proposed in the previous African and global studies.

4.5 Collaboration Strategies

Respondents identified multiple collaboration methods employed by women's groups:

Table 6

Collaboration Methods among Women Groups

Collaboration Method	Frequency	Percentage	Effectiveness Rating (1-5)
Partnership with local authorities	182	86%	4.12
Community sensitization programs	173	82%	4.35
Regular coordination meetings	167	79%	3.98
Joint advocacy campaigns	143	68%	3.76
Economic empowerment initiatives	98	46%	3.52
Religious institution partnerships	89	42%	3.65

Note: Effectiveness rating measured on a 5-point scale where 1 = Very Ineffective, 2 = Ineffective, 3 = Moderately Effective, 4 = Effective, and 5 = Very Effective.

Partnership with local authorities emerged as the most common strategy (86%), enabling groups to leverage formal enforcement powers. A group chairperson explained: "*We work closely with our assistant chief. When we identify brewing sites, we report immediately and accompany police during raids to show locations. This partnership makes our efforts more effective.*"

Community sensitization programs, though slightly less common (82%), showed the highest effectiveness rating (M=4.35). Groups conducted monthly community meetings, door-to-door visits, and school-based programs. A member described: "*We invite health officers to explain alcohol's health effects. We also share testimonies from affected families. These stories are powerful—people see real consequences in their neighbors' lives.*"

Regular coordination meetings (79%) facilitated internal group cohesion and strategic planning. Joint advocacy campaigns (68%) amplified voices through collective action, though resource constraints limited frequency. Economic empowerment initiatives (46%), while less common, addressed underlying economic factors driving alcohol involvement by providing alternative livelihoods.

4.6 Regression Analysis: Women Group Leadership Capabilities and Policy Implementation

Multiple regression analysis examined relationships between leadership capability dimensions and policy implementation effectiveness:

Table 7

Regression Model Summary

Model Statistics	Value
R	0.742
R^2	0.551
Adjusted R^2	0.538
F-statistic	18.367
df	(4, 145)
Sig. (p-value)	<0.001

Table 8

Regression Coefficients

Predictor Variable	Unstandardized Coefficient (B)	Std. Error	Standardized Coefficient (β)	t-value	Sig. (p-value)	VIF
(Constant)	2.135	0.512	--	4.17	0	--
Leadership Decision-Making	0.418	0.105	0.362	3.981	<0.001	1.24
Resource Mobilization	0.291	0.097	0.278	3	0.004	1.18
Advocacy & Sensitization	0.352	0.114	0.301	3.088	0.003	1.32
Monitoring & Accountability	0.267	0.089	0.246	3	0.004	1.15

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It was revealed in the regression analysis that the four dimensions of women group leadership competence collectively explained 55.1 percent of the variance in policy implementation effectiveness, which indicates that these leadership competences can be used to make predictions to a significant extent that can affect successful policy implementation. The model itself was statistically significant ($R^2 = 0.551$, $F = 18.367$, $p < 0.001$), i.e. the joint effect of the leadership competencies was strong enough to reject the null hypothesis with a high level of confidence. The discussion thus validates that the leadership competencies among women groups are very essential in enhancing the policy implementation in the society.

The findings showed there were positive and significant contributions made by all the four dimensions of competence. The most robust one was leadership decision-making ($b = 0.418$, $p < 0.001$), which means that the more inclusive and strategic decisions are made in a group, the more successful its apparatus to control alcohol consumption is. Qualitative insights provided support this observation. According to one group leader, decisions are never taken by a few individuals but via discussions which incorporate everyone. She observed that involvement by all means that the members get more committed since they own the decisions. By forming such structures of participation, groups are able to harness the knowledge of participants, make decisions that are consistent with local realities and establish a sense of collective accountability, which in turn reinforce implementation and follow-through.

The second most influential aspect was advocacy and sensitization ($b = 0.352$, $p = 0.003$). Implementation was better among groups that were carrying out regular awareness campaigns. One of the respondents in the focus group has remembered how their initial attempts were ignored and some people in the community told them that women had no right to comment on the affairs that were seen to be the business of men. The women did not give up on the resistance and they proceeded with community conversations, drama performances, and storytelling based on lived experiences. The attitudes changed with time and even men started asking the group to provide their meetings. This perception shift is mirrored by the finding of Barerah (2018) that community sustained education is a necessity in alcohol control interventions.

The mobilization of resources also played an important role in the success of implementation ($b = 0.291$, $p = 0.004$). Organizations that could attain fiscal, material, or social resources were in a better position to continue and reach a greater number of households. A treasurer said that they got their money every week through the table banking profits, church support, and some harambees which enabled them to hold meetings, make raids on communities, and to host people during sensitization forums. She pointed out that resources would in her words keep our operations down, and that access to resources would mean a straight direct correlation to operational capability. This is similar to the view of Musyoka et al. (2020) that resources are the basis on which agency and collective action is established.

Accountability and monitoring were also found to be an important factor to the success of implementation ($b = 0.267$, $p = 0.004$). Organizations that kept effective records and open reporting were building better internal commitment and trust by the community. According to one of the members, they write down all the events, meetings, and spending in order to bring order and demonstrate the community that they are serious and credible in their work. Governance researchers, including Comwall and Gaventa, (2017), have always observed that accountability and record keeping are the critical constituents of effective community organizations, which the current results also captivate. The Variance Inflation Factor values also supported the statistical validity of the model with all the values being less than 1.5 and this eliminates the possibility of multicollinearity. The constant ($B = 2.135$, $p < 0.001$) revealed that there is a certain degree of policy implementation even in the absence of a women group intervention, probably through the formal implementation, but groups that interfere greatly provide more strength to the base.

The qualitative data also helped to understand how exactly the implementation is actually enhanced by the women groups. The moral authority was one of the mechanisms based on their social positions. As caregivers, women were credible with their words on the evils that alcohol had in the family. A community leader noted that witnessing hunger, neglect and violence were things that provided them with legitimacy which non-members did not have. Women also ensured that critical enforcement loopholes were targeted by ensuring constant attendance in the community. Police raids were not very frequent and depended on outside information whereas women were aware of brewing locations, sellers, and consumers. The presence and intelligence of some of them made enforcement more effective according to one of the enforcement officers.

Another influence mechanism was the community support. The members of the group were integrated into the community hence communicated in culturally fitting ways and were trusted. According to one of the participants, they were neighbors, relatives, and friends, which made their messages more acceptable and convincing. This social embeddedness is consistent with studies that indicate that women leadership is more effective when there is local legitimacy. Women groups also enhanced the implementation through the establishment of alternative support systems to the families that were affected by alcohol. One of the beneficiaries stated that she was counseling her husband, making treatment referrals, and providing food to the family because the home had nothing. These all-encompassing solutions aimed at the social and economic problems that were wider than alcohol abuse and supported the enforcement strategies and the sustainability of the policy.

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4.8 Challenges Faced by Women's Groups

Despite demonstrated effectiveness, women's groups faced significant challenges:

Table 9

Challenges in Policy Implementation

Challenge	Frequency	Percentage	Severity (1-5)
Limited financial resources	198	85%	4.52
Lack of formal recognition	176	75%	4.21
Community resistance/hostility	167	71%	3.98
Gender discrimination	154	66%	3.87
Safety concerns during confrontations	143	61%	4.35
Inadequate training/capacity	132	56%	3.76
Poor coordination with authorities	118	50%	3.65

Note: Severity was measured on a 5-point scale where 1 = Very Low, 2 = Low, 3 = Moderate, 4 = High, and 5 = Very High.

Limited financial resources (85%, severity M=4.52) constrained operational capacity. Groups relied on member contributions and occasional community fundraising, limiting activity frequency and reach. A treasurer lamented: "*We want to do more—visit more villages, hold more meetings—but we lack money for transport, materials, even tea for participants.*"

Lack of formal recognition (75%, severity M=4.21) meant groups operated informally without official status, hindering access to government resources and institutional support. A chairperson stated: "*We're doing government work—implementing their policy—but receive no recognition, no support. If we had official status, we could access county funds and participate in formal planning.*"

Community resistance (71%, severity M=3.98) manifested as verbal abuse, social ostracism, and occasionally physical threats, particularly from those economically benefiting from alcohol trade. A member described: "*Some people insult us, calling us busybodies interfering where we don't belong. Brewers and sellers are hostile because we threaten their income. We face threats, but continue because we believe in our mission.*"

Gender discrimination (66%, severity M=3.87) undermined legitimacy, particularly among male community members dismissing women's authority. A leader explained: "*Some men refuse to attend our meetings, saying 'why should we listen to women?' This attitude limits our reach, though slowly changing as our work shows results.*"

Safety concerns (61%, severity M=4.35) emerged particularly during confrontations with brewers and consumers. Groups accompanying enforcement operations occasionally faced aggressive responses. One member recounted: "*During a raid, intoxicated men became violent. One threw stones at us. We fear for our safety but feel we must continue.*" These challenges align with broader literature on women's community leadership (Kabeer, 2020) while highlighting alcohol control's specific difficulties given economic interests and entrenched social practices.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The study according to its results indicated that the ability of women to lead a group had significant influence on the implementation of illegal alcohol control laws in Nandi North Sub-County. Statistical results also indicated that the combination of decision-making, mobilising of resources, lobbying and sensitization, and monitoring and accountability contributed 55.1 percent to the variation in the effectiveness of policy implementation. The leadership decision making had the greatest effect followed by lobbying and sensitization. There was also a significant contribution on accountability and mobilization of resources. The qualitative findings indicated that women groups possessed local knowledge, legitimized through their social status and that women groups were linked to the community through means of trust which enhanced enforcement and awareness programs.

Although successful, women organizations had to overcome the problem of funding, non-official status, community resistance, sexism and safety. The findings reinforced the ideas of agency and empowerment because they were used to demonstrate how the collective activity of women enabled them to have a considerable impact on policy development despite institutional barriers. The paper found that the involvement of women in formal structures of alcohol control would have improved the policy outcomes because the women organizations provided social capital, moral authority and local experience lacking in state-led initiatives.

5.2 Recommendations

The study proposes that both the federal government and the local government accept women organizations as significant partners in alcohol control by the establishment of co-ordination mechanisms with the health and enforcement departments and through establishing conducive policies. Although other methods such as recognition programs such

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as grants and awards may stimulate active involvement, capacity-building programs may support advocacy and leadership and financial management skills. The women organizations, on their part, should develop strategic plans that have set objectives, enhance documentation, and formalize their organization. They should also form networks of advocacy and resource sharing, implement safety measures and diversify their economic activities in order to ensure sustainability.

The NGOs and development partners are encouraged to encourage participatory research, to provide flexible financial and technical support, and to establish forums of cooperation and exchange of information. Subsequent research ought to focus on cost-effectiveness research of the community-based intervention strategies, comparative county-based research, and long-term research of the community-based women organizations impact. To affirm and generalize the findings, research on gender dynamics should be conducted more, as well as in other fields.

REFERENCES

Babor, T. F. (2010). *Alcohol: No ordinary commodity: Research and public policy* (2nd ed.). Oxford University Press.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175–1184.

Barerah, S. (2018). Forms of drug abuse and their effects. *Alcoholism and Drug Abuse Weekly, 1*(1), 13–19.

Bryceson, D. F. (2002). The scramble in Africa: Reorienting rural livelihoods. *World Development, 30*(5), 725–739.

Cornwall, A., & Gaventa, J. (2017). Participation in governance. In *International development governance* (pp. 405–413). Routledge.

County Government of Nandi. (2021). *Nandi County integrated development plan 2018-2022*. County Government of Nandi.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*. Sage Publications.

Eagly, A. H., & Carli, L. L. (2018). Women and the labyrinth of leadership. In *Contemporary issues in leadership* (pp. 147–162). Routledge.

Eagly, A. H., & Wood, W. (2012). Social role theory. In *Handbook of theories of social psychology* (Vol. 2, pp. 458–476).

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*(1), 57–74.

Gaventa, J., & Cornwall, A. (2004). Power and knowledge (Working Paper). Institute of Development Studies.

Gikandi, W. A., Egunjoki, P. J., & Muriithi, K. J. (2021). Influence of family cohesion on substance use disorder among the youth in selected rehabilitation centers in Nairobi County. *International Journal of Research and Innovation in Social Science, 5*(8), 24–246.

Gitatui, M., Kimani, S., Muniu, S., & Okube, O. (2019). Determinants of harmful use of alcohol among urban slum dwelling adults in Kenya. *African Health Sciences, 19*(4), 2906–2925.

Hassan, Z., & Silong, A. D. (2008). Women leadership and community development. *European Journal of Scientific Research, 23*(3), 361–372.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305–360.

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change, 30*(3), 435–464.

Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1. *Gender & Development, 13*(1), 13–24.

Kabeer, N. (2020). Women's empowerment and economic development: A feminist critique of storytelling practices in "randomista" economics. *Feminist Economics, 26*(2), 1–26.

Kalema, D., Vindevogel, S., Baguma, P., Derluyn, I., & Vanderplasschen, W. (2015). Alcohol misuse, policy and treatment responses in sub-Saharan Africa: The case of Uganda. *Substance Use & Misuse, 50*(7), 862–870.

Kariuki, D. K., Misaro, J., Kabiru, J., & Birech, J. (2013). Alcohol abuse and the family: A case study of the Nandi community of Kenya. *International Journal of Humanities and Social Science, 3*(15), [August 2013].

Lawhon, M., & Herrick, C. (2013). Alcohol control in the news: Framing drinking and drinking spaces in Cape Town. *Health & Place, 19*, 5–10.

Lelei, K., Muteti, J., Njenga, A., Okioma, V., & Lelei, K. (2022). Policy brief on the status of alcohol and drug abuse control in Kenya for the period between 1st January to 30th June 2020. *Volume 7: June 2022*, 66.

Musyoka, C. M., Mbwayo, A., Donovan, D., & Mathai, M. (2020). Alcohol and substance use among first-year students at the University of Nairobi, Kenya: Prevalence and patterns. *PLOS ONE, 15*(8), e0238170. https://doi.org/10.1371/journal.pone.0238170

Mutiso, V. N., Ndetei, D. M., Muia, E. N., Musyimi, C., Osborn, T. L., Kasike, R., Onsinyo, L., Mbijjiwe, J., Karambu, P., Sounders, A., Weisz, J. R., Swahn, M. H., & Mamah, D. (2022). Prevalence and perception of substance abuse and associated economic indicators and mental health disorders in a large cohort of Kenyan students:

Licensed Under Creative Commons Attribution (CC BY-NC)

Towards integrated public health approach and clinical management. *BMC Psychiatry*, *22*(191), 1–17. https://doi.org/10.1186/s12888-022-03817-2

National Authority for the Campaign Against Alcohol and Drug Abuse. (2022). *Status of drugs and substance abuse in Nandi County*.

Northouse, P. G. (2025). *Leadership: Theory and practice* (10th ed.). SAGE Publications.

Nyaga, J., Mwaura, P., Mutundu, K., Njeru, D., Juma, G., & Were, T. (2021). Socio-economic and health consequences of drugs and substance use in Gachie, a peri-urban town on the outskirts of Nairobi. *African Journal of Alcohol & Drug Abuse, 6*(8), 67–80.

Okoyo, C., Njambi, E., Were, V., Araka, S., Kanyi, H., Ongeri, L., Echoka, E., Mwandawiro, C., & Njomo, D. (2022). Prevalence, types, patterns and risk factors associated with drugs and substances of use and abuse: A cross-sectional study of selected counties in Kenya. *PLOS ONE, 17*(9), 1–23. https://doi.org/10.1371/journal.pone.0273470

Rappaport, J. (1981). In praise of paradox: A social policy of empowerment over prevention. *American Journal of Community Psychology, 9*(1), 1–25.

Room, R., Babor, T., & Rehm, J. (2010). Alcohol and public health. *The Lancet, 365*(9458), 519–530.

Theuri, J., & Nzioka, D. (2021). Alcohol and drug abuse as ecological predictors of risk taking behaviour among secondary school students in Kajiado North Sub-county, Kajiado County, Kenya. *African Journal of Empirical Research, 2*(1), 50–55.

Were, M. A. (2021). Effects of the use of illicit brews and substance abuse among youth in Africa: A case study of Kenya (Doctoral dissertation, University of Nairobi).

World Health Organization. (2018). *Global status report on alcohol and health 2018*. World Health Organization.

Yamane, T. (1973). *Statistics: An introductory analysis* (3rd ed.). Harper and Row.

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The effect of devolved agricultural extension services on food production in Kwanza sub-county, Kenya

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ABSTRACT

Devolution in Kenya was introduced with the expectation that shifting service delivery responsibilities from the national government to county governments would improve efficiency, accessibility, and responsiveness across key sectors. Agriculture was one of the major functions assigned to counties, with the aim of bringing extension services closer to farmers and enhancing food production at the grassroots. In Kwanza Sub County, however, the actual influence of devolved agricultural extension services on food production has not been fully studied or documented since devolution took effect. This study was guided by the Four Pillars of Food Security Theory, which highlights availability, access, utilization, and stability as the main factors that shape food security outcomes. The purpose of the study was to examine how devolved agricultural extension services affect food production, with a focus on maize farming, which remains the county's main staple and food security crop. A descriptive survey research design was adopted for the study. The target population consisted of 26,767 maize farmers in Kwanza Sub County. From this population, a sample of 379 farmers was selected through simple random sampling to ensure fairness and representation. In addition, eight key informants drawn from both public and private agricultural institutions were selected through purposive sampling due to their direct involvement in agricultural extension and policy implementation. Data collection involved the use of structured questionnaires, semi-structured questionnaires, and an interview guide. The collected data were analyzed using descriptive and inferential statistics with the support of SPSS software, and the results were presented using tables, charts, and graphs for clarity. The findings revealed widespread dissatisfaction among farmers regarding the effectiveness of agricultural extension services under devolution. A total of 70 percent of respondents disagreed that extension services had contributed to an increase in maize production, and this view was reflected in the low mode and median scores obtained. The results also indicated that several persistent challenges continue to affect extension service delivery. These include limited funding for extension activities as reported by 55 percent of respondents, inadequate staffing as reported by 60 percent, and logistical limitations that restrict extension officers from reaching farmers consistently. The study concludes that, although devolution has the potential to improve agricultural services, the current gaps in funding, staffing, coordination, and farmer engagement continue to hinder meaningful progress in food production in Kwanza Sub County. The study recommends targeted policy reforms, better resource allocation, and enhanced participatory planning to improve the effectiveness of extension services and support sustainable food security in the region.

Keywords: Agricultural Extension Service Provision, Challenges, Devolution, Food Production, Kwanza Sub-County, Kenya

I. INTRODUCTION

Agricultural extension services are essential in improving productivity and promoting food security, especially in areas that face economic and social challenges (Gwademba & Achieng, 2025). In Kwanza Sub-County, Trans Nzoia County, these services have been decentralized through Kenya's devolved system of government, giving county authorities the mandate to plan and deliver agricultural support that responds to farmers' specific needs (Omamo & Collins, 2023). Agricultural Extension and Advisory Services (AEAS) refer to a network of institutions and professionals that help farmers and other value chain actors gain the knowledge, skills, and technologies needed to increase productivity, improve food and nutrition security, and enhance overall well-being (Danso-Abbeam et al., 2018). Globally, effective extension systems form a foundation for agricultural transformation, poverty reduction, and sustainable rural development.

The success of agricultural extension depends on how well it addresses the needs of farmers and contributes to solving wider food insecurity problems that affect household livelihoods. (Gwademba & Achieng 2025) found a strong positive correlation between access to extension services and agricultural productivity in their study in western Kenya. Evaluating the performance of devolution in this area therefore requires understanding how these services are currently

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being implemented, the constraints faced by both farmers and extension officers, and the overall influence on food production at the local level.

In this study, the performance of devolution refers to the efficiency and effectiveness of county governments in providing agricultural extension services after responsibilities were transferred from the national government. This performance is reflected in the quality, reach, and accessibility of the services provided to farmers. Indicators such as the number of extension officers in a county, farmer satisfaction levels, the frequency of field visits, and collaboration among agricultural stakeholders help determine how well the devolved system is functioning. Extension Services enhance food crops production (maize included) hence enhance food security (Omamo & Collins, 2023).

Food security, as defined by the World Food Summit held in Rome, Italy in 1996 exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs for an active and healthy life (Food and Agricultural Organization [FAO], 1996). It can be assessed through the availability of food (production levels), access to food (affordability and purchasing power), and the nutritional status of the population. In the context of this research, food security is shaped by the effectiveness of agricultural extension services, which equip farmers with knowledge and resources to raise production and improve access to food (FAO et al., 2019). The Global Food Security Index (GFSI) provides an international benchmark for measuring drivers of food security, including affordability, availability, quality, and sustainability (The Economist, 2022). This framework underscores the importance of accessible extension services in strengthening local food systems.

Despite their importance, agricultural extension services in Kenya face several challenges. These include inadequate funding, limited staffing, poor coordination among actors, and logistical difficulties that hinder regular contact with farmers (Mwamfupe et al., 2019). Identifying and addressing such barriers is necessary to improve the reach and impact of extension programs.This study was therefore designed to examine how devolved agricultural extension services are meeting the needs of farmers in Kwanza Sub-County. It also highlights the role of effective policy frameworks, coordination among stakeholders, and farmer participation in enhancing agricultural productivity and ensuring food security, particularly through maize production, which remains the area's main food crop.

1.1 Statement of the Problem

Despite the constitutional mandate requiring counties to promote food security, the implementation of devolved agricultural extension services in Kwanza Sub-County has remained ineffective. In principle, devolution was expected to improve service delivery by making it easier for farmers to access modern farming technologies, quality inputs, regular training, and strong stakeholder support. However, this has not been achieved in practice, as many farmers still experience persistent food insecurity due to gaps in how these services are provided. (Mbise, 2016), noted that farmers realized improved maize production and proper management practices due to information and support received from extension services. Challenges such as limited funding, an inadequate number of extension officers, poor infrastructure, and weak coordination among key players continue to hinder the proper dissemination of agricultural knowledge and resources (Mwamfupe et al., 2019). Empirical evidence shows that although policies to guide extension services exist (Ministry of Agriculture and Livestock Development, 2022), their implementation at the county level is inconsistent, resulting in reduced farmer confidence and fragmented service delivery. These persistent challenges highlight the need for targeted actions to strengthen the quality, accessibility, and effectiveness of agricultural extension services so that they can play their intended role in improving food production and food security in the region (FAO et al., 2019).

1.2 Research Objective

To assess the effect of devolved agricultural extension services on food production in in Kwanza Sub County, Kenya.

1.3 Research Question

What are the effects of devolved agricultural extension services on food production in Kwanza Sub County, Kenya?

II. LITERATURE REVIEW

2.1 Theoretical Review

The Four Pillars of Food Security Theory provides the foundation for this study because it explains the main elements that determine food security in any setting (FAO et al., 2020). The theory highlights four pillars that must work together for households to be food secure: availability, access, utilization and stability. Each of these pillars contributes to understanding the conditions that influence food security (FAO et al., 2019), especially in communities like Kwanza Sub County where maize is the main staple crop. By using this theory, it becomes possible to assess how agricultural extension services shape farmers' production decisions and overall food availability in the area.

One of the strengths of the Four Pillars of Food Security Theory is its ability to incorporate different factors that influence food security. Availability focuses on whether food is physically present in a region, which depends on

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production levels, distribution systems and supply chains. Access looks at whether households have the financial and physical ability to obtain food, which is often linked to income, market access and infrastructure. Utilization refers to how food is consumed and the nutritional value households gain from it, while stability concerns the consistency of availability, access and utilization over time despite shocks such as climate change or economic disruptions (Food Security Cluster Handbook). In Kwanza Sub County, where maize production is central to household well-being, the framework helps show how extension services interact with these pillars.

The theory is also useful because it provides a detailed structure for examining the various elements that influence food security, making it easier to analyze the role of extension services. Since the pillars are connected, improving one area often supports the others. For example, when farmers can access markets more easily, they are better able to obtain food and improve how they use it, contributing to greater stability. This interconnectedness makes the framework appropriate for evaluating extension services, which aim to improve production, information access and household food outcomes.

Its practical application across different contexts further strengthens the theory. Because it can be adapted to various communities, it becomes a suitable tool for examining agricultural issues in rural areas such as Kwanza Sub County. Extension officers can use the framework to design programs that increase maize production and support food security. However, the theory also has limitations. The close relationship between the pillars sometimes makes it difficult to determine the exact influence of each one, and focusing only on the general interactions may overlook local realities that affect food security.

The usefulness of the theory also depends on the availability of reliable data, which is not always easy to obtain in developing regions. This makes it harder to measure each pillar accurately (Webb et al., 2006). In addition, food security conditions change over time due to climate variability, shifting economic conditions and political decisions. The theory may not always capture these rapid changes, showing the need for regular updating of food security strategies. Despite these challenges, the Four Pillars Theory remains valuable. It helps researchers assess how extension services support farmers in key areas of food security. The theory also supports policymakers in making decisions that target the pillars that need improvement most (World Bank, 2018). Regular assessment of each pillar allows planners to adjust their strategies as conditions evolve. The emphasis on community involvement in the model highlights the importance of including farmers in decision-making so that extension programs are more effective.

In conclusion, the Four Pillars of Food Security Theory offers a strong framework for analyzing food security in Kwanza Sub County. Applying this theory to agricultural extension services helps identify the strengths and gaps in current approaches. Understanding both the theory and its practical application can guide improvements in extension service delivery, contribute to better food security outcomes and support increased maize production in the region.

2.2 Empirical Review

2.2.1 The Effect of Devolved Agricultural Extension Services on Food Production

Studies across Africa show that extension services play a central role in shaping food production outcomes. Chowa et al. (2013) used focus group discussions with farmers and extension officers in Malawi to examine small-scale farmers' experiences with access to multiple extension service providers. The study found that farmers had access to a variety of technical advice and enterprise specific technology. This improves their skills and adopt better production methods, which contributes to greater food security. However, he also discovered that most service providers dominate and decide what to offer by pushing particular technologies rather than addressing the farmers' specific needs.

Mbise (2016) conducted a study in Ludewa district (Njombe region) of Tanzania on the impact of extension services on agricultural production. The outcome showed the importance of extension services in raising both quality and quantity of maize produced by farmers. The study showed that majority of farmers did not access extension services hence the need to support smallholder agriculture in rural Tanzania. He recommended a greater investment in extension to ensure greater access by smallholder farmers in Tanzania.

Research on devolution in Kenya shows that county governments have had mixed outcomes in delivering extension services, Muhumed and Minja (2019) reported that devolution made it easier for farmers in Wajir County to get extension support, farm inputs and financial assistance which improved their food productivity. Their findings reinforced the importance of extension in promoting food security. Mutuga (2018) noted that fish farming productivity went down in Laikipia County because of rising costs, reduced subsidies, staffing shortages and limited funding. Kyambo et al. (2021) found that factors such as gender, education and income levels affected how aware farmers were of devolved agricultural services in Kitui County. These studies demonstrate that devolution has introduced both opportunities and challenges in extension service delivery. Understanding these perceptions is crucial for designing extension programs that benefit all categories of farmers.

Given that Trans Nzoia County differs from others in agricultural potential, climatic conditions and economic structure, this study addresses an existing gap by examining how devolution has influenced extension services and food production specifically in Kwanza Sub County. The findings add to ongoing discussions on devolution and rural

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development and provide evidence that can inform policy reforms aimed at improving extension services and strengthening food production in Kenya.

III. METHODOLOGY

3.1 Research Design

This study was conducted using descriptive survey research design (Siedlecki, 2020). The study is concerned with establishing the nature of relationship between devolution and provision of extension services and its overall impact on food production and food security. It specifically intended to investigate the relationship between devolution of extension services and food production and food security by farmers. Such issues are best investigated through a descriptive survey. The design enabled the researcher to collect, organize and evaluate data from by engaging the respondents who are at the Centre of the study in their natural environment for honesty.

3.2 Target Population

The targeted population is the maize farmers in Kwanza Sub County, Trans Nzoia County. These are 26,767 (91.2%) farmers registered in the maize for food value chain out of the 29,348 total number of farmers registered in Kwanza Sub County in all crop production value chains according to KALRO-NAD portal, 2023/24 National Farmers Registration).

3.3 Sample Size and Sampling Technique

Kwanza Sub County has 26,767 (91.2%) farmers registered in the maize for food value chain out of the 29,348 total number of farmers registered in crops value chains in the Sub County. To determine the appropriate sample size, Krejcie & Morgan (1970) provide a formula for sample size determination in a finite population:

$$n = X^2NP(1-P)/e^2(N-1) + X^2P(1-P)$$

Where:

n = Required sample size

N = Population size (26,767)

e = Acceptable sampling error

X^2 = Chi-square of degree of freedom 1 and confidence 95% = 3.841

P = Proportion of population (if unknown, 0.5)

Using this formula, Krejcie and Morgan (1970) recommend a sample size of 379 for populations up to 30,000. Thus, this study adopted a sample size of 379 respondents, selected using a cluster sampling technique where respondents were grouped in clusters of five farmers apart to ensure adequate representation across the sub-county.

Purposive sampling was employed to obtain the key informants, by handpicking those that satisfy the characteristics of this study. These were from the various public and private agricultural institutions which will include Ministry of Agriculture, Research institutions, non-governmental organizations, and farmers' representatives.

3.4 Data Collection Instruments

Primary data collection was by use of interviews, document analysis and questionnaires which were close and open ended. Close ended questionnaires are useful in quantifying the data that was obtained while open ended are useful in obtaining views, perceptions and opinions of the respondents. The researcher administered interviews to the key informants to obtain true information. The primary data was collected with the help of research assistants who was trained to undertake the administration of questionnaires to the respondents.

3.5 Data Collection Procedure

Both primary and secondary data was collected by use of interviews, document analysis and questionnaires. Primary data was collected from the sample population of farmers in the study area. This contributed to the understanding on how extension services have impacted on food production. Interview guides with open ended discussion questions was used to collect data from selected key informants. Secondary data was obtained by reviewing county annual agricultural reports, county integrated development plans as well as reports from other agricultural institutions.

3.6 Data Analysis and Presentation

Data was cleaned by reviewing all questionnaires and interview guides for completeness and consistency. The data was then captured, coded, analyzed by a statistical package (SPSS) and summarized using mean, median and mode and measures of dispersion such as range, quartile deviation, standard deviation and variance to describe a group of

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subjects. Analyzed data was presented in tables, graphs and charts. Correlation and regression analysis was done to show causal effect and for understanding the relationship between variables.

3.7 Ethical Considerations

Each respondent was also informed of the purpose of the study, expected duration of the study, any risks or discomforts to the respondents, any benefits and extent of privacy and confidentiality before beginning any interviews. They were also assured of that any sensitive and personal information was not shared in any other forum except for purposes of the study. The respondents were treated with respect and dignity. Age, culture, religion and social class of the respondents were respected. The privacy and confidentiality of the respondents which involves gaining access to some lists and files to obtain samples for study was respected since all information obtained was in strict confidence. The respondents had the right to remain anonymous as well as freedom to ignore items that they do not wish to respond to and participate in the study voluntarily.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

In the study, 379 questionnaires were distributed among selected respondents to fill in relevant information, out of which 374 questionnaires were successfully filled as requested and returned back hence leading to 98.68% return rate.

Table 1

Questionnaire Return Rate

Questionnaire	Number	Percentage %
Delivered	379	100.00
Returned	374	98.68
Not returned	5	1.32

4.1.1 Effect of Devolved Agricultural Extension Services on Food Production:

Descriptive analysis included description of frequencies, percentages, mode and median and the findings were presented in tables as below. The statements (enablers of maize production) were anchored on a five-point Likert-type scale ranging 5= Strongly Agree (SA), 4= Agree (A), 3= Undecided (U), 2=Disagree (D), 1=Strongly Disagree (SD) and respondents were asked to indicate the extent to which they agreed to the questionnaire statements during data collection.

Table 2

Effect of Devolved Agricultural Extension Services on Food Production

Statement	1=SD	2=D	3=U	4=A	5=SA	Mode	Median
Agricultural extension services have led to an increase in maize production in Kwanza Sub County.	50%	15%	10%	10%	15%	1	1
Credit facilities are easily accessible to farmers and have improved food security in Kwanza Sub County.	50%	30%	10%	5%	5%	1	1
Farmers have adopted better farming practices due to the extension services provided.	40%	25%	5%	25%	5%	1	2
The information provided by extension services is practical and easy to implement.	50%	10%	5%	30%	5%	1	1
Farmers believe that access to agricultural subsidies has enhanced maize production in Kwanza Sub County.	45%	15%	25%	10%	5%	1	2
The devolved system of government has made agricultural extension services more accessible to farmers.	40%	25%	10%	15%	10%	1	1
Farmers feel that their input is considered in the planning and provision of extension services under the devolved system.	50%	30%	15%	3%	2%	1	1

The descriptive results show clear dissatisfaction among farmers regarding the contribution of devolved agricultural extension services to maize production in Kwanza Sub County. As indicated in Table 2, half of the respondents strongly disagreed that extension services had increased maize production, while another 15 percent disagreed, giving a combined total of 65 percent. With both the mode and median at 1, it is evident that most farmers did not experience any meaningful improvement in productivity from extension support. This finding suggests a need to strengthen extension programs so that they respond better to the production challenges farmers face. Indeed,

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Muhumed and Minja (2019) reported that devolution made it easier for farmers in Wajir County to get extension support, farm inputs and financial assistance which improved their food productivity.

A similar trend is observed with regard to access to agricultural credit. The results show that 50 percent strongly disagreed and 30 percent disagreed that credit facilities are easily accessible or supportive of food security efforts. With a mode and median of 1, the data confirm that most farmers face financial limitations. These constraints reduce their ability to buy key inputs such as fertilizers, seeds and machinery, which negatively affects maize production. This results align with Mbise (2016) who posited that limited access to formal credit also pushes farmers toward informal and often costly lending options, indicating the need for counties to work with financial institutions to improve credit outreach.

The findings also show that adoption of better farming practices through extension support remains low. According to Table 2, 40 percent strongly disagreed and 25 percent disagreed that farmers have changed their farming practices as a result of extension services. The mode value of 1 and the median value of 2 point to minimal uptake of recommended techniques. This suggests that existing trainings may not be sufficiently practical or consistent to influence change. This is supported by Guiné et al. (2021) who reinforced the need to restructure how training is offered, including more demonstrations and field-based engagements with farmers.

The practicality of extension information was another area of concern. Half of the respondents strongly disagreed that the information provided is easy to apply, with a further 10 percent disagreeing. The mode and median values of 1 indicate a shared perception that the advice does not fit well with local realities. The findings therefore point to the need for extension messages that are simplified, farmer-friendly and aligned with the conditions and resources available in Kwanza Sub County.

With regard to agricultural subsidies, 45 percent of farmers strongly disagreed and 15 percent disagreed that subsidies have improved maize production, while 25 percent remained undecided. The median value of 2 suggests that although some farmers acknowledge some benefit, the majority have not experienced notable gains. Farmers emphasized that subsidies should extend beyond fertilizers to include certified seeds, pesticides, herbicides and farm machinery, which would have a broader impact on production.

The devolved system of governance has also not been viewed positively in terms of making extension services more accessible. According to the table, 40 percent strongly disagreed and 25 percent disagreed that devolution has improved access to extension officers or services, giving a combined 65 percent. The mode and median values of 1 show that farmers believe service delivery challenges such as staffing gaps and poor coordination remain unresolved, even after devolution.

Similarly, farmers do not feel adequately involved in extension planning. Half strongly disagreed and 30 percent disagreed that their input is considered in decision making. With a mode and median score of 1, the results show that most farmers feel excluded from the processes that shape agricultural services. This limits the effectiveness of extension initiatives because farmer participation is important for developing responsive and context-specific interventions.

Overall, the results show widespread dissatisfaction with extension services, credit access, subsidies and farmer involvement, pointing to gaps in the devolved agricultural system. Farmers believe the current extension approach is not sufficiently practical, accessible or responsive. For more effective outcomes, policies should focus on participatory planning, strengthening extension capacity, improving access to credit and broadening subsidy support. Mbise (2016) study revealed the importance of agricultural extension services in raising quality and quantity of maize production. He recommended greater investment and focus to improve agriculture extension services in Tanzania. Extension services should be designed to ensure greater access by smallholder farmers through greater innovation, including use of ICT and related services.

Despite the general dissatisfaction, qualitative interviews show that a minority of farmers (20 percent) who strongly agreed or agreed with the statements had experienced noticeable improvements. These farmers attributed increased maize production to the fertilizer subsidy program, which expanded maize acreage. Some farmers confirmed improved food availability in local markets, while others noted that those who adopted recommended agronomic practices such as early land preparation, timely planting and use of certified seeds had seen better yields. Chowa et al. (2013) found that farmers who had access to a variety of technical advice and enterprise specific technology improved their skills and adopted better production methods, which contributes to greater food security. This shows that where extension services are applied consistently, positive results are achievable.

Further, 49 percent of the farmers reported an increase in maize production when comparing the 2022 and 2023 seasons. They linked the gains mainly to improved input access and better agronomic practices. Muhumed and Minja (2019) reported that farmers who get extension support, farm inputs and financial assistance improved their food productivity. These insights are summarized in the graph that follows.

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Table 3

Descriptive Statistics for Food Production (Dependent Variable)

Food Production Indicator	Increased	No Change	Decreased	Mode	Median
Maize yield per acre compared to previous season	49%	35%	16%	1	2
Number of farmers reporting improved maize quality	42%	40%	18%	1	2
Household maize availability throughout the season	38%	44%	18%	2	2
Market availability of maize at affordable prices	53%	32%	15%	1	2

The descriptive results show that food production in Kwanza Sub County presents a mixed picture, with nearly half of the farmers reporting some level of improvement. As shown in Table 3, 49 percent of respondents indicated an increase in maize yield per acre compared to the previous season. This confirms the qualitative findings where 182 farmers acknowledged improved production. However, 35 percent reported no change, while 16 percent experienced reduced yields. The median value of 2 suggests that most farmers are clustered around slight improvement or no change.

Regarding maize quality, 42 percent of the farmers noted improvements, which they attributed to better agronomic practices and, for some, access to subsidized fertilizer. Still, 40 percent saw no change while 18 percent recorded poorer quality harvests, pointing to variability across the sub county.

The results on household maize availability show that 38 percent of households experienced better food availability, although for most respondents (44 percent), availability remained unchanged. This suggests that increases in yield have not yet translated into uniform improvements in household food security. Market availability of maize at affordable prices was reported by 53 percent of respondents, consistent with interview responses noting that maize is more accessible in local markets. This does not automatically translate to improved household food security because some farmers still produce below their household needs. (FAO et al., 2019), reports that when farmers can access markets more easily, they are better able to obtain food and improve how they use it, contributing to greater stability.

Overall, the dependent variable shows that while some farmers are benefiting, food production gains are uneven. The distribution confirms that any positive changes are influenced more by input subsidies (Muhumed & Minja, 2019) and individual effort than by widespread, effective extension service delivery.

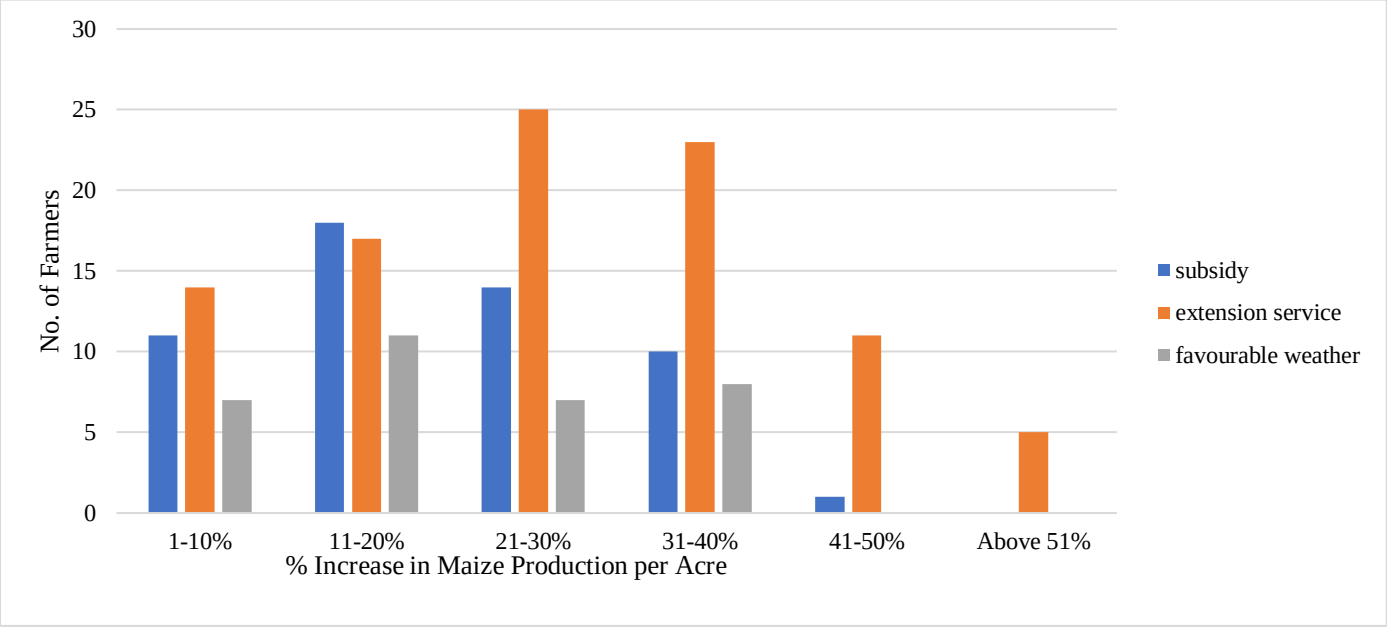

Figure 1

Estimated Percentage Increase in Maize Production/Acre and reasons for increase (2022 versus 2023 seasons).

The findings presented in the graph illustrate that extension services to farmers leads to better farming practices hence an increase in maize production. At least 52% attributed the increase to access to extension services, another 30% believed it was through the fertilizer subsidy program and only 18% attributed it to favorable weather. Furthermore, as a result of extension the farmers realized a higher percentage increase per acre of between 21% to above 51% as compared to reasons of subsidies and favorable weather.

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Table 4

Correlation matrix for Agricultural Extension Services and Food Production

Variable	Maize Production Impact	Credit Access Impact	Adoption of Better Practices	Practical Information
Maize Production Impact	1.000	0.988	0.999	0.930
Credit Access Impact	0.988	1.000	0.985	0.975
Adoption of Better Practices	0.999	0.985	1.000	0.923
Practical Information	0.930	0.975	0.923	1.000

The correlation results suggest a strong positive relationship between the components of agricultural extension services and maize production in Kwanza Sub-County. The adoption of improved farming practices shows the highest association with maize production (r = 0.999). This is consistent with field reports indicating that farmers who implemented recommended practices, such as timely planting and proper fertilizer use, generally achieved better yields. The strength of this relationship indicates that practical agronomic behaviour remains central to improving production outcomes.

Credit access also shows a strong correlation with maize production (r = 0.988). Farmers who are able to secure credit tend to purchase essential inputs more consistently. However, qualitative responses revealed that many farmers still face difficulty in obtaining formal credit, which limits the full potential of this relationship.

The correlation between practical extension information and maize production (r = 0.930) further highlights the value of farmer-friendly and context-specific advisory services. Respondents indicated that they benefit more from demonstrations and clear explanations that match local conditions. Extension messages that are difficult to apply tend to have limited impact, even when farmers understand the recommendations.

Although the correlations are high across variables, they should be interpreted as indicating strong associations rather than proof of direct causation. The results point to the importance of strengthening extension delivery methods, improving access to finance, and promoting the adoption of suitable farming practices as part of efforts to enhance food production in the Sub-County.

Table 5

Regression Analysis for Agricultural Extension Services and Food Production

Variable	Coefficient (β)	Standard Error	t-value	p-value
Constant	2.7	0.45	6.0	0.08
Credit Access Impact	0.50	0.09	5.56	0.11
Better Practices	0.85	0.07	12.1	**0.03**
Practical Information	0.30	0.06	5.0	0.13

The findings indicate that the adoption of better farming practices (p = 0.03) is the strongest predictor of maize production in Kwanza Sub County. This underscores the importance of translating agricultural knowledge into practical action. Simply providing information is not enough unless farmers actively implement improved techniques. Effective extension services should therefore focus on bridging the gap between knowledge and practice to achieve significant improvements in crop yields.

While credit access and practical information are positively correlated with maize production, their statistical insignificance suggests that financial support alone does not automatically translate to higher yields. Farmers must be equipped with the necessary skills to use credit effectively, ensuring that funds are directed toward productivity-enhancing inputs such as improved seeds, fertilizers, and modern farming techniques. Without proper guidance, access to financial resources may have a limited impact on overall agricultural performance.

To enhance the adoption of best practices, agricultural policies should prioritize hands-on learning approaches. This can be achieved through farmer mentorship programs, practical demonstrations, and the establishment of model farms, where farmers can observe, practice, and refine new techniques under real conditions. By integrating experiential learning with financial and technical support, policymakers can create a more effective and sustainable agricultural extension system that drives long-term productivity gains.

The findings agree with the study titled '*The Impact of Agricultural Extension on Food Security in Sub-Saharan Africa*,' (Omamo & Collins, 2023). They assessed the role of agricultural extension services in enhancing food security across several countries in the region. Their findings indicate that effective extension services led to increased production of staple crops, including maize, thereby improving food security among farming households. This highlights the critical role that extension services play in not only supporting individual farmers but also in contributing to broader food security initiatives. While these studies confirm the importance of extension services, they do not explicitly address the challenges of service delivery, funding, and sustainability in the context of local counties, which requires further exploration.

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Similarly, Taye (2013) did a review of impact evaluation reports on agricultural extension programs in Sub-Saharan Africa (SSA). The results of impact evaluations conducted in 10 SSA countries including Kenya, Somali, Ivory Coast, Rwanda, Burkina Faso, Uganda, Zimbabwe, Mozambique, Ethiopia, and Tanzania were collected from various websites for the analysis. In addition, agricultural productivity trends reported by various authors on a variety of reports and websites are included. The study was mainly based on qualitative analysis. The quantitative data were analyzed using simple descriptive statistics. He noted that various extension programmes have been launched in sub-Saharan Africa with the aim of improving agricultural production and productivity. However, agricultural production and productivity is not growing as it should be in the region. Despite this fact, most of the impact evaluation studies conducted on agricultural extension programmes in the region have reported positive and significant impacts.

A paper by Radimi and Kabiti (2019) in the "*South African Journal of Agricultural Extension",* highlighted various means by which agricultural extension and training can help address food security at the household level. Given that in South Africa, most poor people live in rural areas and that agriculture is their main source of livelihood, focusing on factors that will enhance smallholder agriculture will bring about a lasting solution to the problems of rural poverty and food insecurity. Public agriculture extension service is the main support system available to smallholder farmers in South Africa.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study examined the effect of agricultural extension services on maize production in Kwanza Sub-County. The findings suggest that, overall, these services have had a limited impact on improving maize yields. Most farmers reported little or no benefit, with the majority indicating that extension services had not contributed significantly to increased production. This reveals that current extension approaches may not adequately address the practical challenges farmers face in improving productivity.

A major constraint identified is the limited access to credit facilities, which is critical for purchasing better inputs and adopting modern farming techniques. Many farmers reported difficulties in obtaining credit, highlighting the need for improved financial support mechanisms. Without sufficient funding, even well-designed farming practices cannot be effectively implemented. This limitation restricts farmers' ability to invest in productivity-enhancing inputs such as improved seeds, fertilizers, and farm machinery.

The adoption of improved farming practices also remains low despite the presence of extension services. A significant number of respondents indicated that they had not implemented recommended techniques, suggesting that training programs may not be sufficiently practical or tailored to farmers' specific needs. Many struggle to translate theoretical knowledge into actionable strategies, which limits the potential gains from extension support. Additionally, the information provided by extension officers was often viewed as difficult to apply in real farming conditions, creating a gap between advisory services and actual practice. Government support through agricultural subsidies has also fallen short of expectations. A large majority of farmers reported that subsidies had not meaningfully enhanced maize production. This points to a need for better-targeted programs that meet farmers' real needs. Similarly, the introduction of devolved governance has not significantly improved the accessibility or effectiveness of extension services. Farmers indicated that service availability and engagement under the county system remain largely unchanged.

Finally, farmers feel their input is not adequately considered in the planning and delivery of extension programs. Over half of the respondents expressed that their views are ignored in decision-making processes. This lack of participatory planning reduces the relevance and responsiveness of extension services, emphasizing the importance of including farmers in designing interventions that align with local realities and challenges.

5.2 Recommendations

The findings of this study suggest several actions to improve agricultural extension services and maize production in Kwanza Sub-County. The County Government of Trans Nzoia has prioritized agriculture in its development plans, but existing barriers still limit the effectiveness of extension programs. Digitizing services and creating integrated digital platforms could help farmers access extension advice, financial services, and market information more efficiently. Involving multiple stakeholders, including government agencies, non-governmental organizations, private sector actors, and farmer groups, can also improve coordination, resource allocation, and knowledge sharing, making extension services more responsive to local needs.

Another important step is to increase the number of extension officers across all wards. More officers would allow for frequent field visits, personalized guidance, and practical support, helping farmers apply recommended techniques on their farms. Consistent engagement between extension personnel and farmers is essential for turning knowledge into action and improving productivity. Finally, greater financial support for extension services is needed. Funding from both national and private sources would ensure that extension officers have adequate resources, farmers

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receive sufficient training, and essential inputs are more widely available. Enhanced investment in extension programs would strengthen service delivery, support sustainable farming practices, and ultimately improve food security and maize production in the sub-county.

REFERENCES

Chowa, C., Garforth, C., & Cardey, S. (2013). Farmer experience of pluralistic agricultural extension, Malawi. *The Journal of Agricultural Education and Extension, 19*(2), 147–166. https://doi.org/10.1080/1389224X.2012.735620

Danso-Abbeam, G., Ehiakpor, D., & Aidoo, R. (2018). Agricultural extension and its effects on farm productivity and income: Insight from Northern Ghana. *Agriculture and Food Security, 7*, Article 22. https://doi.org/10.1186/s40066-018-0225-x

FAO, IFAD, UNICEF, WFP, & WHO. (2019). *The state of food security and nutrition in the world 2019: Safeguarding against economic slowdowns and downturns*. Rome: FAO.

FAO, IFAD, UNICEF, WFP, & WHO. (2020). *The state of food security and nutrition in the world 2020: Transforming food systems for affordable healthy diets*. Rome: FAO.

FAO. (1996). *Rome Declaration on World Food Security and World Food Summit Plan of Action*. World Food Summit, November 13–17, 1996, Rome, Italy. http://www.fao.org/3/w3613e/3613e00.htm

Food Security Cluster. (n.d.). *Food Security Cluster Handbook*. https://handbook.fscluster.org/docs/231

Guiné, R. D. P. F., Pato, M. L. D. J., Costa, C. A. D., Costa, D. D. V. T. A. D., Silva, P. B. C. D., & Martinho, V. J. P. D. (2021). Food security and sustainability: Discussing the four pillars to encompass other dimensions. *Foods, 10*(11), 2732. https://doi.org/10.3390/foods10112732

Gwademba, G., & Achieng, M. (2025, January). Effectiveness of extension information services in improving agricultural productivity among smallholder farmers in Western Kenya. *International Journal of Science and Research, 14*(1), 478–486. https://doi.org/10.21275/SR25109204829

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610.

Kyambo, O., Kilungo, J., & Amwata, D. (2021). The influence of selected socio-economic factors on farmers' awareness of devolution of agricultural extension services in Kitui County, Kenya. *American Journal of Agriculture, 3*(1), 1–20. https://doi.org/10.47672/aja.731

Mbise, M. (2016). The impact of extension services on agricultural production: A case of maize in Ludewa District of Njombe Region, Tanzania. *Research Application Summary, 14*(14), 105–111.

Ministry of Agriculture and Livestock Development, Kenya. (2022). *Kenya Agricultural Sector Extension Policy*. https://www.kilimo.go.ke

Muhumed, I., & Minja, D. (2019). The effect of devolution of agricultural sector on the citizens' livelihoods in Wajir County. *International Journal of Current Aspects, 3*, 187–198. https://doi.org/10.35942/ijcab.v3iIII.40

Mutuga, M. K. (2018). Effect of devolution of governance powers from state to county government on fish farming enterprise in Laikipia County, Kenya (Final project, UNU FTP). United Nations University Fisheries Training Programme. http://www.unuftp.is/static/fellows/document/martin16prf.pdf

Mwamfupe, D., Mbilinyi, A., & Mbunda, D. (2019). Decentralization of agricultural services in Tanzania: The case of local government authorities. *Tanzania Journal of Development Studies, 19*(1), 45–66.

Omamo, S. W., & Collins, J. (2023). The impact of agricultural extension services on food production and food security: A mixed-methods study. *Global Agricultural Development Review, 25*(1), 33–50.

Radimi, E. N., & Kabiti, H. M. (2019). A review of the role of agricultural extension and training in achieving sustainable food security: A case of South Africa. *South African Journal of Agricultural Extension, 47*(3), 120–130. https://doi.org/10.17159/2413-3221/2019/v47n3a520

Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist, 34*(1), 8–12. https://doi.org/10.1097/NUR.0000000000000493

Taye, H. (2013). Evaluating the impact of agricultural extension programmes in Sub-Saharan Africa: Challenges and prospects. *African Journal, 1*(1), Article 19. https://doi.org/10.4102/aej.v1i1.19

The Economist. (2022). *Global Food Security Index 2022: Exploring challenges and developing solutions for food security across 113 countries*.

Webb, P., Coates, J., Frongillo, E. A., Rogers, B. L., Swindale, A., & Bilinsky, P. (2006). Measuring household food insecurity: Why it's so important and yet so difficult to do. *Journal of Nutrition, 136*(5), 1404S–1408S. https://doi.org/10.1093/jn/136.5.1404S

World Bank. (2018). *Poverty and shared prosperity 2018: Piecing together the poverty puzzle*. https://www.worldbank.org/en/publication/poverty-and-shared-prosperity-2018

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The influence of participatory budgeting on public service delivery: A case of Nanyumbu District Council, Mtwara, Tanzania

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ABSTRACT

This study explores the influence of participatory budgeting on public service delivery in Nanyumbu District Council, Mtwara, Tanzania. The study was guided by institutional theory. The target population was 580 people. The research adopted a descriptive research design, with a sample of 237 respondents selected using purposive and simple random sampling techniques. Data were collected through **s**tructured questionnaires and interviews**,** enabling the researcher to capture both quantitative and qualitative insights. Quantitative data were analyzed using descriptive statistics in SPSS**,** while qualitative data were analyzed using thematic analysis**.** The findings revealed that participatory budgeting is transparent and fair, contributing to service delivery outcomes. Furthermore, the data indicated that challenges such as bureaucratic hurdles, lack of awareness, resource limitations, political interference, and low citizen participation hindered the effectiveness of participatory budgeting in Nanyumbu district. The study recommends strengthening civic education, institutionalizing feedback mechanisms, and enhancing technological tools to improve the effectiveness and inclusiveness of participatory budgeting at the local level.

Keywords: Mtwara, Nanyumbu District Council, Participatory Budgeting, Public Service Delivery, Tanzania

I. INTRODUCTION

A widely acknowledged breakthrough in democratic government and public administration is participatory budgeting (PB). PB was first used in 1989 in Porto Alegre, Brazil, with the goal of directly involving regular people in budget decision-making. The approach gained popularity in other Brazilian towns following initial testing from 1989 to 1995. It then swiftly spread across Latin America and Europe, including France, Germany, Italy, and Spain (Reuben, 2003). By the early 2000s, more than 50 European towns had used the technique; prominent examples include the UK, Poland, and Portugal. International development organizations such as UN-Habitat and the World Bank played a pivotal role in promoting its adoption across Africa, Eastern Europe, Asia, and North America (Reuben, 2003).

Direct citizen participation in governance, especially on budgetary issues, is not a novel idea. According to historical accounts, the Greek city-states, particularly the Ecclesia of Athens, are where participatory decision-making first emerged. Male residents over the age of 18 were permitted to discuss and make decisions on public issues in this early democratic assembly (Schugurensky, 2004). Despite restricting membership to particular groups, medieval European guilds and voluntary societies established the foundation for organized civic engagement early on (World Bank, 2001). According to Arzaluz (2013), the fundamental tenet of participatory budgeting is the belief that all individuals, particularly those affected by public spending, should have a say in the distribution of resources.

In more recent decades, countries across Latin America, particularly those embracing democratic reforms, have increasingly integrated participatory approaches into their budgeting systems. This integration is seen as a hallmark of good governance, enhancing not only transparency and accountability but also social cohesion and public trust (Zolezzi et al., 2019). According to Peters et al. (2020), successful participatory planning depends on shared objectives, clear procedures, and active engagement from both trained public officials and community members.

Nevertheless, the outcomes of participatory budgeting vary significantly across regions. While some cities and municipalities report enhanced service delivery and more democratic governance, others, particularly in Africa, continue to struggle with closed-door budget processes, inadequate reporting mechanisms, and the marginalization of civil society in budget discussions. In these contexts, access to budget information is often limited, weakening accountability and citizen confidence (UN-Habitat, 2004).

In Tanzania, the call for participatory governance has deep historical and political roots. The late President Julius Nyerere emphasized the importance of a democratic local government system that enables citizens to make decisions on matters that directly affect them. This vision was operationalized through the establishment of Ward Development Committees (WDCs), which replaced colonial-era chiefdoms and aimed to place decision-making power

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in the hands of the people. From 1962 to 1966, Tanzania began formalizing local governance structures, including the creation of the Local Government Service Commission to manage and supervise local staff (Max, 1991).

Today, local government authorities in Tanzania are tasked with supporting peace, order, and good governance through grassroots participation. Budgeting processes typically begin at the community level from the streets and villages, through the WDCs, and ultimately to the district councils. This hierarchical yet participatory system enables citizens to contribute to development planning and resource allocation (Buele et al, 2020).

The rationale for citizen participation in budgeting is grounded in several theoretical frameworks, including democratic engagement, social development, human growth, and economic efficiency (Somech, 2002). These perspectives collectively affirm the value of involving citizens in budget formulation to ensure public spending reflects real community priorities. The salient guided research question remains: 'as to what extent citizens are aware of participation in budget making in local government authorities in Tanzania.

1.1 Statement of the Problem

Participatory budgeting has been promoted as a means of achieving public service delivery because it addresses the needs of the poor and vulnerable groups. In Tanzania, this process has been integrated through decentralization by devolution (D-by-D) policy. This local budgeting framework aims to address issues faced by people living in rural areas, especially in villages, by designing community development projects that reflect reality (United Republic of Tanzania [URT], 2009). Goal 16 of the Sustainable Development Goals aims to promote and provide access to justice for all through local governments. The goal can be achieved by emphasizing participatory budgeting at all levels, allowing citizens to participate in public spending decisions and discuss allocation of funds, and enhancing access to essential public services to citizens (Asukile & Mbogo, 2022).

Malipula (2022) argues that participatory budgeting serves as a budgetary tool to improve collaboration between the government and local communities by strengthening local government capacity by identifying and supporting community initiatives through project development. Moreover, Rugeiyamu (2021) asserts that participatory budgeting may differ in localities and countries depending on the level of context insensitivity, costs of participation, local political culture, limited fiscal autonomy, and knowledge of budget mechanisms.

Moreover, Madaha (2020) argues that participatory budgeting may have unintended consequences, such as the exclusion of community dynamics, especially the majority of rural dwellers in the Global South who are disempowered simply because they cannot perform technical tasks, thereby hindering the equitable realization of benefits, such as equity in public service delivery. Participatory budgeting becomes very effective when local communities have extensive knowledge of the budgeting process and resource allocation, as countries such as Brazil, Central America, Canada, and Germany have successfully implemented it.

Previous research has identified challenges that hinder the effectiveness of participatory budgeting: limited knowledge of budgeting issues, a dispersed population in reaching conclusions, and decision-making on how to ensure that public spending matches public service delivery. In developed countries, participatory budgeting has prospered due to well-established, long-standing reforms and management; the case is different in developing countries like Tanzania (Miller et al., 2019).

At Nanyumbu District Council, experience shows that citizens participate in the participatory budgeting meetings, but it's unclear whether their inputs are incorporated into project selection. This study, therefore, aims to examine the influence of participatory budgeting on public service delivery in Tanzania, specifically in Nanyumbu District Council, Mtwara.

1.2 Research Objective

The study aims to investigate the influence of participatory budgeting on public service delivery: A case of Nanyumbu district council, Mtwara, Tanzania.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Institutional Theory

This study is grounded in Institutional Theory, which was developed by W. Richard Scott in 1987 and later refined in his 1995 work. Scott (1995) defined institutional theory as examining "the deeper and more resilient aspects of social structure" and "the processes by which structures, including schemes, rules, norms, and routines, become established as authoritative guidelines for social behavior"). The theory assumes that organizations operate within established institutional environments that shape their behavior through formal rules, cultural norms, and cognitive frameworks. Institutional theory considers "organizations to work within a given set of values, norms, and assumptions which constitute a reasonable economic behavior" (Science Direct Topics, 2024).

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Institutional theory is relevant to the study because it provides a framework for allocating funds based on citizens' priorities, directly impacting the quality and focus of the service delivery system through advocacy and norm establishment. It considers addressing needs assessment and resource allocation, as well as evaluating and monitoring the budget to ensure that public funds are spent to address the community's needs.

2.2 Empirical Review

Musadat (2023) conducted a comprehensive study in Indonesia examining the effects of participatory budgeting on local government service delivery. The findings revealed that PB contributed to improved public outcomes, such as a higher net enrolment rate at the junior secondary school level and increased access to sanitation services. However, the study also identified significant limitations: poor representation of marginalized populations due to elite dominance in agenda setting, weak pro-poor targeting strategies, and low participation rates among disadvantaged groups.

Similarly, Harun et al. (2021) investigated the relationship between financial literacy and participatory budgeting in the context of village fund initiatives in Indonesia. Their findings indicated that many citizens, particularly the poor, lacked sufficient knowledge of budgeting processes, thereby restricting their active engagement. Other barriers included a lack of incentives and the high opportunity cost of participation, both of which contributed to unequal access to public services.

In Latin America, Buele et al. (2020) assessed the contribution of PB to local governance and found that, although widely applied, PB alone was insufficient to guarantee meaningful participation or improved governance outcomes. They recommended that PB be supported by complementary mechanisms, such as popular consultations, advisory councils, referenda, citizen observatories, and social accountability platforms, to deepen democratic engagement and policy legitimacy.

In the United Kingdom, Hagan et al. (2019) examined participatory budgeting in Scotland and found that while PB was intended to promote equality and community engagement, the Equality Act of 2010 limited its effectiveness. The Act fell short in enabling PB to serve as a strategic tool to combat inequality, leaving marginalized groups underrepresented in local budget decisions.

Within Tanzania, several studies have assessed the implementation and outcomes of PB at both urban and rural levels. Asukile and Mbogo (2022) examined the impact of budgetary practices, including participatory budgeting, on the performance of Local Government Authorities (LGAs) in Ilala Municipal Council. Using regression analysis and factor analysis, the study found that participatory budgeting, budget planning, and execution were all positively correlated with improved budget performance. Among these, budget planning emerged as the most significant predictor of efficiency and effectiveness, offering practical insights for strengthening fiscal governance in LGAs.

A national-level scoping review by Manara (2024) synthesized 21 publications covering rural councils in Tanzania. The evidence suggests that participatory budgeting is highly context-sensitive and faces significant challenges in rural areas, including high participation costs, limited fiscal autonomy, weak political support, and trade-offs between inclusivity and depth of knowledge. These factors collectively hindered the applicability and success of PB in rural governance settings. Malipula (2022) conducted a qualitative stakeholder analysis in Kibaha Town Council. The study involved 42 participants, including focus groups and key informants, and revealed that space for citizen participation in planning and budgeting was severely limited. Most residents lacked both awareness and the ability to influence decisions, informally or formally, indicating the need for broader civic education and engagement efforts.

Mærøe et al. (2020) focused on digital innovation through e-participatory budgeting platforms. Their findings showed that digital PB initiatives in local governments had relatively low participation rates. The study linked this to weak e-governance frameworks and poor legitimacy practices, but also found that projects with higher visibility and funding tended to attract more citizen engagement. Implementing practical digital tools and information systems was identified as a way to boost civic involvement in budgetary decisions.

Finally, Madaha (2020) examined how PB could empower African communities using a Tanzanian case study. While the study found that frameworks for PB implementation existed and could promote community empowerment, they were vastly underutilized. The author concluded that if the Tanzanian government were to fully commit to engaging citizens at all administrative levels, PB could become a powerful instrument for inclusive and democratic local governance.

III. METHODOLOGY

3.1 Study Area

This refers to the geographical location covered by the study, always stated in terms of the country, state, local government, community, discipline, or institution (Kumar, 2019). This study was conducted in the Mtwara region, at the Nanyumbu district council. The researcher chose this study area due to its uniqueness as an interactive business Center where people of different calibers interact and understand the importance of participatory budgeting for public service delivery within the specific context.

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3.2 Research Design

Research design provides guidelines that direct the researcher towards solving the problem and may vary depending on the nature of the problem being studied. The study used a case study design. According to Kombo and Tromp (2006), a case study design was used because it saved time and resources by allowing the researcher to gather information from a single location and from respondents only once. The case study design helped provide insight into the broader picture of the population by analyzing the basics in detail.

3.3 Population of Study

A population is any set, person, or object that possesses at least one common characteristic (Creswell & Creswell, 2018). Generally, it is a group of people or elements that share at least one common characteristic. The study's target population comprised 580 health officers, education officers, village executive officers, accounts officers, and planning officers from the Nanyumbu district council.

3.4 Sampling Procedure and Sample Size

According to Bryman (2016), probability sampling is choosing members based on a known probability. This study used probability sampling, in which a researcher selects individuals to participate and everyone has an equal chance of being selected. In this study, probability sampling was employed —specifically, simple random sampling — because it ensured that each participant had an equal chance of being selected. Purposive sampling was used in this study to select key informants, including civil society groups and local residents in the Nanyumbu district council.
A sample is a segment of the population selected for investigation. It is a subset of the population (Bryman, 2016). Nanyumbu district council has a total number of 580 workers. The researcher calculated the sample size using the Yamane formula

Table 1
Sample Distribution Table

No.	Type of Respondents	Population	Sample size
1	Health Officers	164	63
2	Education Officers	200	80
3	Accounts Officers	94	44
4	Village Executive Officers	72	28
5	Planning Officers	50	22
6	**Total**	**580**	**237**

3.5 Data Collection Methods & Instruments

Creswell (2014) defines data collection instruments as the specific tools or strategies that researchers use to collect data from participants in a study. These instruments help researchers gather information that is relevant to their research questions and objectives. This study used questionnaires, interviews, and documentary review as data collection tools.

According to Kothari (2004), a questionnaire is a method of data collection that involves asking individuals a series of predetermined questions to gather information on various topics. It can be used in surveys and other research methods to obtain quantitative data. Kothari (2004) defines an interview as a method involving the presentation of oral verbal stimuli and the elicitation of oral verbal responses. This method can be done through a face-to-face or telephone interview. The study used interviews to collect data that addressed specific objectives.

3.6 Reliability and Validity

The researcher’s conclusions must therefore be trustworthy and legitimate. Any researcher seeking high-quality research should take validity and reliability into account when planning a study, interpreting the findings, and presenting them. As recommended by Kothari (2004), this study achieved validity in several ways. First, it involved carefully crafting questions and pre-testing questionnaires to ensure they were understandable and that potential issues were detected early, allowing for easy identification of remedies. Second, to identify and correct mistakes and omissions made during data recording, the gathered data was edited. The goal is to achieve accuracy, consistency, and completeness. The researcher formulated a sufficient number of questions for this study, and questionnaires were used to gather data from a variety of respondents. But the purpose of the reconnaissance was to test the equipment.

3.7 Data Analysis

Data processing and analysis for this study were carried out using both manual and statistical software techniques. Quantitative survey data were analyzed using SPSS to compute descriptive statistics (means, percentages,

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and frequencies) and assess the influence of participatory budgeting on public service delivery**.** Qualitative data from interviews were analyzed thematically, following the steps outlined by Kothari (2004). This approach helped in identifying key themes and patterns in the data that align with the research objectives. The combination of statistical and thematic analysis enabled robust interpretation of both objective and subjective data, offering a comprehensive understanding of the research questions.

IV. FINDINGS & DISCUSSION

4.1 Response Rate

A total of 237 questionnaires were distributed to participants across various departments within the council. Of these, 220 questionnaires were fully completed and returned, yielding an exceptionally high response rate of 95.6%. Such a strong response rate strengthens the credibility of the findings and provides a solid basis for drawing reliable conclusions. In addition to the questionnaire responses, 10 interviews were conducted, achieving a 100% response rate, as all targeted participants were available and agreed to participate in the scheduled interview sessions. Interviews were conducted in real time by the researcher. The integration of both survey and interview data enhanced the richness of the dataset and enabled triangulation, which helps validate findings through cross-verification across multiple sources (Dillman et al., 2014).

Overall, the combination of high response rates and diverse data sources enriched the analysis by providing a broad understanding of key issues, including respondents' demographic backgrounds, familiarity with budget processes, and engagement with participatory budgeting initiatives at the local level.

Table 2

Response Rate of Questionnaire Distribution

Description	Frequency	Percentage (%)
Questionnaires Distributed	237	100%
Questionnaires Returned	220	95.6%
Questionnaires Not Returned	17	24.4%

4.2 Perceptions of Government Officials on the Influence of Participatory Budgeting on Public Service Delivery

This was the study's first objective. To address this objective, the study investigated four key variables that directly reflect perception: transparency and fairness of PB processes, satisfaction with service delivery outcomes, government responsiveness to community needs, and citizen empowerment through participation. These variables were selected because they indicate how citizens evaluate the effectiveness and inclusiveness of participatory budgeting and whether they believe it contributes meaningfully to the quality and accessibility of public services. The findings for each variable are discussed below.

Table 3

Government officials Perception of the Influence of Participatory Budgeting on Public Service Delivery

Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total
I am aware of participatory budgeting processes in my community.	15 (6.8%)	20 (9.1%)	25 (11.4%)	80 (36.4%)	80 (36.4%)	220 (100%)
Participatory budgeting has improved public service delivery.	20 (9.1%)	30 (13.6%)	40 (18.2%)	70 (31.8%)	60 (27.3%)	220 (100%)
Government officials' involvement leads to better allocation of public funds.	10 (4.5%)	25 (11.4%)	35 (15.9%)	90 (40.9%)	60 (27.3%)	220 (100%)
The government is transparent about how PB decisions are implemented.	25 (11.4%)	35 (15.9%)	50 (22.7%)	70 (31.8%)	40 (18.2%)	220 (100%)

Frequencies (%)

The findings in Table 2 show that the majority of government officials expressed positive perceptions of participatory budgeting (PB) and its role in enhancing public service delivery, although levels of agreement varied across the different indicators: Awareness of PB Processes: About 72.8% of respondents reported being aware of PB processes in their communities, while only 15.9% disagreed and 11.4% remained neutral. This suggests that PB initiatives have achieved significant visibility among citizens, a necessary step toward inclusive participation.

Improved Service Delivery: A total of 59.1% agreed that PB has enhanced public service delivery, with 22.7% disagreeing and 18.2% neutral. While the majorities recognize improvements, the relatively high share of neutral and disagreeing responses suggests that not all respondents have experienced tangible benefits, underscoring the need for

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more consistent service outcomes across different areas. Better Allocation of Public Funds. The perception that citizen involvement leads to better allocation of funds received strong support, with 68.2% agreeing/strongly agreeing, compared to only 15.9% disagreeing and 15.9% neutral. This indicates that citizens value the input they provide in budgetary processes and believe it results in more efficient and fair resource use.

Government Transparency. Responses were more divided on transparency. While 50% agreed or strongly agreed that the government is transparent about PB implementation, a notable 27.3% disagreed, and 22.7% remained neutral. This demonstrates that, although PB has introduced greater openness, many citizens still feel the government could enhance accountability and clarity in how decisions are implemented. Citizen Involvement in PB. The strongest level of agreement was recorded for the statement on expanding citizen involvement, with 81.9% in favor and only 6.8% disagreeing. This underscores a widespread demand for more participatory opportunities, reflecting that while citizens value the process, they believe it remains limited in inclusivity and scale.

The findings suggest that participatory budgeting is primarily perceived as beneficial in promoting transparency, better resource allocation, and improved service delivery. However, concerns about limited inclusiveness and inconsistent government transparency remain. Most notably, the overwhelming call for greater citizen involvement indicates that expanding participation could strengthen trust, accountability, and the overall effectiveness of PB in delivering public services. In addition, respondents were interviewed to obtain their opinions on various variables related to citizens' perceptions of participatory budgeting's influence. On the statement, transparency and fairness of PB processes. One of the health officers said,

> *"It is somewhat transparent, but not entirely inclusive. Some groups, especially marginalized communities, struggle to have their voices heard due to limited awareness or accessibility issues. Sometimes, even the leaders involved in budgeting are corrupt and prioritize their personal needs over societal welfare. The presence of bias, nepotism, and arrogance undermines the fairness of PB."*

Another one added,

> *"We only attend village meetings to raise concerns, but the local government already makes the final decisions. This limits the transparency and fairness of the budgeting process, as community input has little influence on outcomes. Although public meetings are organized to educate people on PB, attendance is often low. This, combined with tax ignorance and corruption, makes it difficult to achieve transparency and equitable distribution of resources."*

Regarding the variable satisfaction with service delivery outcomes;

One of the education officers said;

> *"Public service delivery is inconsistent. While there have been improvements in some areas, such as road maintenance and waste management, healthcare and education still require significant investment. I believe PB has a positive impact because it allows the government to understand and prioritize the real needs of the people. However, a lack of follow-through can lead to frustration among citizens. Sometimes, disengagement and negligence of village leaders make citizens perceive PB as not being effective in solving their concerns and regard it as a negative aspect."*

Regarding the variable government responsiveness to community needs, one of them, who is a local government official, said,

> *"It is a shame how we organize public meetings to provide education regarding PB, but the number of participants attending the meeting is very low, which is very discouraging and heartbreaking. Bad enough when it comes to citizens paying taxes; first, they do not pay on time, and some are unaware that the taxes they pay are used to fund public services and improve social services. We do have a long way to go to improve service delivery in our council."*

Moreover, this study also interviewed local residents to get their perceptions regarding how participatory budgeting influence service delivery.

A local business owner added;

> *"PB can help the government understand real community needs. However, if these inputs are ignored or manipulated by politicians, responsiveness becomes questionable. A parent may care about education, while a commuter might prioritize roads. Politicians tend to respond only to the majority voices, which may not reflect the most pressing or diverse needs of the whole community. Government officials argue that the community's low literacy limits meaningful input, so decisions are made based on what they perceive as a priority. This top-down approach limits genuine responsiveness."*

Regarding the variable citizen empowerment through participation, one elderly citizen insisted;

> *"Participatory budgeting has the potential to empower citizens, especially when it includes marginalized voices. When done right, it can address systemic issues and bring equity. Unfortunately, many citizens are not fully informed about how the budgeting process works. With better awareness and education, more people would participate, and their involvement could lead to better outcomes and a stronger sense of empowerment."*

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Another one added**;**

"*Participatory budgeting can be a powerful tool to address inequities in our neighborhoods. When marginalized voices are included, we can ensure that funding addresses systemic issues affecting our communities. However, I worry that participatory budgeting might favor younger voices. Older residents often have different needs, and I hope that our perspectives are also considered in these discussions.''*

4.2.1 Challenges Affecting Effective Participatory Budgeting on Public Service Delivery

The study investigated five key variables that directly reflect challenges affecting PB: bureaucratic hurdles, lack of awareness, resource limitations, political interference, and low citizen participation. These variables were selected because they indicate how citizens failed to engage effectively in participatory budgeting due to such constraints. The findings for each variable are discussed below.

Table 4

Challenges Affecting PB

Challenges of PB	**Frequency**	**Per cent**
Bureaucratic hurdles	22	10
Lack of awareness	31	14.0
Resource limitations	30	13.6
Political interference	71	32.2
Low citizen participation	66	30
Total	**220**	**100.0**

From the table above 3, 22 (10%) of respondents indicated that bureaucratic hurdles are the biggest challenge, 31 (14%) revealed the existence of a lack of awareness, 30 (13.6%) stated resource limitations as a shortcoming, 71 (32.2%) noted that political interference, and 66 (30%) low citizen participation. Respondents were also interviewed about their views on challenges affecting PB, and they had the following to say. One of the public servants said,

"As a government official, I often encounter significant bureaucratic hurdles that impede effective participatory delivery. The existing administrative processes are often convoluted and slow, which discourages citizen engagement. For instance, lengthy approval processes for community projects can lead to frustration among citizens who feel their voices are not heard in a timely manner. Additionally, the lack of clear guidelines for navigating these bureaucratic systems creates confusion, making it difficult for citizens to understand how they can participate meaningfully in governance. This complexity not only alienates citizens but also results in missed opportunities for valuable input that could enhance public services."

Another community leader added;

"Bureaucratic hurdles are a major barrier to effective participation in our community. Many residents feel overwhelmed by the paperwork and regulations required to engage with local government. For example, when we try to organize community meetings to discuss local issues, we often face delays in securing permits or approvals. This not only wastes time but also diminishes community enthusiasm for participation. We need to advocate for streamlined processes that allow for quicker responses and more accessible pathways for community involvement."

Moreover, respondents reported dissatisfaction with the level of awareness of PB. One of the respondents said;

"Many citizens are simply unaware of their rights or the mechanisms available for them to engage with local governance. Our surveys indicate that a significant portion of the population is unaware of public forums or how to voice their concerns effectively. This lack of awareness is compounded by insufficient outreach efforts from local authorities. We need to implement comprehensive awareness campaigns that educate citizens about their rights and the importance of their participation in decision-making processes."

Another one insisted;

"I often feel that many people in my neighborhood don't know how to get involved in local governance. There are meetings and forums, but they aren't well publicized, and many residents don't even know they exist. This lack of awareness leads to a sense of disconnection from the decision-making processes that affect our lives. I believe that if more people were informed about these opportunities, we would see a much higher level of engagement and participation in our community."

Regarding resource limitations, respondents are not pleased with how authorities allocate resources for public services. One of the respondents said;

"Our department often struggles with insufficient funding to support community engagement initiatives. For instance, we would like to hold more workshops and informational sessions to encourage citizen participation, but budget constraints limit our ability to do so. Additionally, the lack of human resources

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means that we cannot dedicate enough staff to outreach efforts, which further hampers our ability to engage with the community effectively."

Another one emphasized;

"From my perspective, resource limitations severely impact our ability to mobilize citizens for participatory initiatives. We often rely on volunteers to run programs, but without adequate funding, we cannot provide the necessary training or materials. This lack of resources not only affects the quality of our outreach but also discourages potential participants who may feel that the initiatives are not well-supported or credible. We need to advocate for better funding and resource allocation to ensure that participatory processes are robust and effective."

Additionally, political interference is a big bottleneck at the Nanyumbu district council. Most respondents preferred that PB be separated from political interference and given the chance to operate independently within defined boundaries. One of the respondents said;

"Often, local leaders may prioritize their political agendas over genuine community needs, which can skew the participatory process. For example, when decisions are made based on political affiliations rather than community input, it breeds distrust among citizens. This interference can lead to tokenistic participation, in which citizens are invited to provide input, but their feedback is ultimately ignored. To foster genuine engagement, we need to establish independent oversight mechanisms that can ensure that participatory processes are free from political manipulation."

4.4 Discussion

4.4.1 Perceptions of Government Officials on the Influence of Participatory Budgeting on Public Service Delivery.

The first objective of the study sought to evaluate how citizens regard engaging in participatory budgeting (PB). The findings indicated that about 72.8% of respondents were aware of PB in their communities, suggesting that the initiative has gained some recognition. However, awareness alone did not necessarily guarantee meaningful engagement, as many of them still lacked the knowledge or confidence to participate fully. This observation is consistent with Malipula (2022), who argues that many Tanzanian citizens are unaware of the importance of their voices in decision-making and remain passive during budget hearings.

Regarding service delivery, the study found that 59.1% of respondents agreed, while 22.7% disagreed. PB has contributed to improvements in some sectors, though citizens felt that benefits were unevenly distributed. While areas such as infrastructure and waste management had made some progress, others, such as education and health services, required further attention. These findings support Madaha's (2021) argument that citizens often view PB as time-consuming and bureaucratic, with limited impact on service quality.

Regarding resource allocation, about 68.2% of citizens acknowledged that PB provides an avenue for better prioritization of public funds, suggesting that their participation can lead to a fairer and more efficient distribution. Nonetheless, challenges remained, particularly regarding the top-down nature of decision-making. These findings are consistent with Manara (2024) emphasize that PB in Tanzania is still dominated by district and central government structures, with communities often restricted to implementation rather than active decision-making.

Government transparency emerged as a divided area of opinion. Findings revealed that 50% agreed with the statement while 27.3% disagreed. While some citizens recognized improvements in openness, others expressed concern that PB decisions were often predetermined, reducing the credibility of the process. This finding aligns with Cabannes (2015), who observes that local authorities frequently exert substantial control over PB processes, and with Sedmihradská et al. (2022), who argues that communities in Tanzania generally participate at a low level of consultation, while ultimate authority remains with government institutions.

4.4.2 Challenges Affecting Effective Participatory Budgeting

Study findings revealed that, at the Nanyumbu district council, citizens are invited to vote on various projects during the PB process. Nevertheless, the process may pose practical challenges when contextual issues are disregarded, especially in marginalized and remote rural areas. Marginalized groups do not have enough votes to air their concerns, and they are taken for granted. Moreover, rural area citizens are not active in PB process as in urban areas. Even their literacy level is low.

These findings align with Madaha (2020) who explained how cumbersome procedures often delay decision-making processes. For instance, the approval of community projects can take months due to excessive paperwork and regulations. This not only frustrates citizens but also undermines their trust in local government. We need to streamline processes to ensure that public input translates into timely action, thereby enhancing community engagement. From a grassroots perspective, bureaucratic obstacles are a major barrier to participation. Harun et al. (2021) highlights that complex bureaucratic structures can alienate citizens. Many community members feel overwhelmed by the requirements to engage with local authorities. Simplifying these processes is essential to encourage participation. If citizens perceive engagement as burdensome, they are less likely to contribute, ultimately hampering effective public service delivery.

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Malipula (2022) notes that many citizens are unaware of their rights and the avenues for participation in governance. This ignorance leads to a disconnect between the government and the community. Increasing awareness through targeted campaigns can empower citizens, making them more likely to engage with public services and contribute to decision-making. In a similar vein, Sedmihradská et al. (2022) emphasized that without proper information, citizens may not realize how their involvement can affect change. Our educational workshops aim to bridge this gap, but there's still a long way to go. We need sustained efforts to inform communities about participatory opportunities, so everyone can take part in shaping public services.

These findings align with Peters et al. (2020), who indicated that when political agendas overshadow community needs, genuine participation suffers. For instance, local leaders may prioritize projects that align with their political interests rather than those that reflect the community's needs. This dynamic can lead to disillusionment among citizens who may feel that their voices are not heard or valued in the decision-making process.

If local governments lack the authority to allocate funds effectively, the process feels hollow. Citizens become frustrated when they see that their input does not lead to real changes because decision-makers are bound by restrictive budgets or regulations. These findings are consistent with Rugeiyamu (2021), who discussed how insufficient funding hampers the ability to conduct outreach and engagement activities. For example, without adequate budget allocations, the community struggles to organize community forums that facilitate citizen input. This lack of resources not only affects the quality of participation but also limits the scope of services we can offer.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The study concluded that there are positive perceptions towards PB among citizens of the Nanyumbu district council; however, citizens felt less empowered and satisfied by the process as it was not practiced fully across the district. Also, the study concluded that there are many challenges, such as low citizen participation and bureaucratic hurdles, which make PB ineffective at Nanyumbu District Council, as there are limited initiative measures to raise awareness and motivate citizens to use the e-feedback system at large.

5.2 Recommendations

Nanyumbu district should partner with local organizations to provide workshops and training sessions that inform citizens about participatory processes, how to navigate them, and the importance of their involvement in governance. Moreover, it should establish a dedicated fund for participatory projects that local governments and NGOs can access. This fund should prioritize initiatives that promote community engagement and capacity building.

REFERENCES

Arzaluz, S. (2013). La institucionalización de la participación ciudadana en municipios mexicanos: Notas a partir del Premio Gobierno y Gestión Local. *Gestión y Política Pública*, *22*(1), 161–202. http://www.scielo.org.mx/pdf/gpp/v22n1/v22n1a5.pdf

Asukile, F., & Mbogo, C. (2022). Influence of budgetary practices on budget performance of local government authorities in Tanzania. *Journal of Finance and Accounting*, *10*(2), 112–120. https://doi.org/10.11648/j.jfa.20221002.14

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Buele, I., Videira, P., Yagüe, J., & Cuesta, F. (2020). The participatory budgeting and its contribution to local management and governance: Review of the experience of rural communities from the Ecuadorian Amazon rainforest. *Sustainability*, *12*(11), 4659. https://doi.org/10.3390/su12114659

Cabannes, Y. (2015). The impact of participatory budgeting on basic services: Municipal practices and evidence from the field. *Environment and Urbanization*, *27*(1), 257–284. https://doi.org/10.1177/0956247815572297

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: The tailored design method* (4th ed.). John Wiley & Sons. https://doi.org/10.1002/9781394260645

Hagan, M., MacRae, C., O'Connor, C., Broadhurst, J., & Teedon, P. (2019). Participatory budgeting (PB), community engagement and impact on public services in Scotland. Glasgow, UK: Glasgow Caledonian University, WiSE Research Centre, Glasgow School for Business and Society, Yunus Centre for Social Business and Health.

Licensed Under Creative Commons Attribution (CC BY-NC)

Harun, H., Graham, P., Kamase, H., & Mir, M. (2020). A critical analysis of the impacts of financial literacy and NPM on village funds initiative in Indonesia. *International Journal of Public Administration, 44*(8), 1–10. https://doi.org/10.1080/01900692.2020.1722165

Kombo, K. D., & Tromp, L. A. D. (2006). *Proposal and thesis writing: An introduction*. Paulines Publishers.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners* (4th ed.). Sage Publications.

Madaha, R. M. (2020). Can local African communities be empowered through participatory budgeting? *International Journal of Social and Administrative Sciences, 5*(2), 74–93. https://doi.org/10.18488/journal.136.2020.52.74.93

Maerøe, A., Norta, A., Tsap, V., & Pappel, I. (2020). Increasing citizen participation in e-participatory budgeting processes. *Journal of Information Technology & Politics, 18*, 1–15. https://doi.org/10.1080/19331681.2020.1821421

Malipula, M. M. (2022). Enhancing citizens' participation in planning and budgeting in Kibaha Town Council, Tanzania. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi dan Organisasi, 29*(2), Article 5. https://doi.org/10.20476/jbb.v29i2.1362

Manara, K. (2024). A scoping review of the practicality of participatory budgeting in rural Tanzania. *Bisnis & Birokrasi: Jurnal Ilmu Administrasi dan Organisasi, 31*(1), 1–10. https://doi.org/10.20476/jbb.v31i1.1503

Max, J. (1991). *The development of local government in Tanzania*. Education Publishers and Distributors Ltd.

Miller, S. A., Hildreth, R. W., & Stewart, L. M. (2019). The modes of participation: A revised frame for identifying and analyzing participatory budgeting practices. *Administration & Society, 51*(8), 1254–1281. https://doi.org/10.1177/0095399717718325

Musadat, A. (2023). The effects of participatory budgeting on local government service delivery: Evidence from Sumedang. *Bulletin of Indonesian Economic Studies, 59*(1), 29–60. https://doi.org/10.1080/00074918.2021.1931031

Peters, M. D. J., Godfrey, C., McInerney, P., Munn, Z., Tricco, A. C., & Khalil, H. (2020). Scoping reviews. In E. Aromataris & Z. Munn (Eds.), *JBI manual for evidence synthesis* (Ch. 11). Joanna Briggs Institute. https://jbi-global-wiki.refined.site/space/MANUAL

Reuben, W. (2003). *The role of civic engagement and social accountability in the governance equation*. World Bank.

Rugeiyamu, R. (2021). The role of improved O&OD methodology in promoting social economy in Tanzania: A solution to sustainable community social development projects? *Local Administration Journal, 14*(3), 213–231. https://doi.org/10.1234/laj.v14i3.253183

Schugurensky, D. (2004b). The tango of citizenship learning and participatory democracy. In K. Mundel & D. Schugurensky (Eds.), *Lifelong citizenship learning, participatory democracy and social change* (pp. 326–334). Transformative Learning Centre, OISE/UT.

Science Direct Topics. (2024). Institutional theory: An overview. https://www.sciencedirect.com/topics/economics-econometrics-and-finance/institutional-theory

Scott, W. R. (1995). *Institutions and organizations*. SAGE Publications.

Sedmihradská, L., Kukučková, S., & Bakoš, E. (2022). Project-oriented participatory budgeting in the Czech Republic. In M. S. De Vries, J. Nemec, & D. Špaček (Eds.), *International trends in participatory budgeting* (pp. 159–177). Palgrave Macmillan.

Somech, A. (2002). Explicating the complexity of participative management: An investigation of multiple dimensions. *Education Administration Quarterly, 38*(4), 555–577.

UN-Habitat. (2004). *Participatory budgeting: Conceptual framework and analysis of its contribution to urban governance and the Millennium Development Goals* (Concept Working Paper No. 140). UN-Habitat.

United Republic of Tanzania. (2009). *Local government reform programme II (Decentralisation by devolution)*. Prime Minister's Office, Regional Administration and Local Government.

World Bank. (2001). *Participatory budgeting* (Vol. 1 of 2). Public Sector Governance and Accountability Series. World Bank. http://documents.worldbank.org/curated/en/635011468330986995

Zolezzi, M. (2019). Participación en planeación y elaboración del presupuesto en Villa El Salvador e infant mortality in Brazil. *World Development, 53*(94), 110.

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Social media publicity implications and corporate reputation in Rwanda: A case of MTN Rwandacell

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ABSTRACT

This study examined how social media publicity influences customer satisfaction, loyalty, and brand perception, focusing on MTN Rwandacell PLC, one of Rwanda's major telecommunications companies. The research was guided by social capital theory and social network theory, which helped explain how online interactions build trust, shape relationships, and influence customer behavior. Social Capital Theory supported the idea that trust, engagement, and mutual communication on social media strengthen connections between MTN and its customers, while Social Network Theory helped the researcher understand how digital networks and information flows affect the way customers respond to the company online. A mixed-methods design was used to gain a well-rounded view of the topic. From a target population of 954 people, the researcher applied purposive sampling to select 232 respondents from Giporoso I in Kigali—specifically choosing individuals who actively interact with MTN on social media. Data was gathered through structured questionnaires and interviews, allowing both statistical and thematic analysis. The findings showed that positive online engagement—especially timely responses, transparency, and interactive campaigns—improves how stakeholders perceive MTN. However, poor handling of negative comments remains a challenge. About 91.4% of respondents agreed that MTN's interactive campaigns and online conversations strengthen its reputation (mean = 4.34), while 89.2% believed that timely responses build trust and reinforce how customers view the company (mean = 4.25). The correlation results showed a strong positive relationship between social media publicity and customer loyalty ($r = .694$, $p < 0.01$), and regression findings confirmed that social media engagement significantly predicts customer loyalty ($B = 0.745$, $Beta = 0.812$, $p = .000$). The study concludes that social media publicity implications range amidst key indicators that drive the corporate reputation of organizations. Based on these insights, the study recommends that MTN enhance its social media strategy by maintaining consistent communication, adopting real-time monitoring tools, and improving how it manages online crises to protect its reputation and build long-term customer loyalty.

Keywords: Corporate Reputation, Customer Loyalty, Customer Perception, MTN Rwandacell, Social Media Publicity

I. INTRODUCTION

Social media has significantly influenced numerous aspects of modern life, particularly the business landscape. It has revolutionized the ways in which organizations conduct operations, promote their products and services, and engage with their audiences to uphold and strengthen their corporate image. According to Obar and Wildman (2015), social media refers to interactive digital platforms that enable users to create, distribute, and exchange content, ideas, and expressions through social networking sites (SNSs). Ur Rahman et al. (2020) emphasized that these tools are not only affordable and user-friendly but also have the potential to reach vast and diverse audiences rapidly. Building on this, Kateri (2021) observed that companies are increasingly adopting social media strategies as a core component of their business development and customer engagement efforts. In today's competitive environment, leveraging social media effectively is no longer optional but essential for companies aiming to remain relevant, responsive, and reputable in the eyes of consumers.

Parveen et al. (2016) emphasized that social media provides a reliable and effective platform through which organizations can directly engage with their customers. Studies support the idea that consumers are more inclined to trust content shared on official brand social media profiles, considering them credible sources of information. According to Tendai (2024), Rwanda recorded approximately 4.91 million internet users at the start of 2024, translating to an internet penetration rate of 34.4%. During the same period, the country had an estimated 930,400 active social media users, representing about 6.5% of the national population. Furthermore, there were around 12.29 million active mobile cellular connections, equivalent to 86.2% of the population.

Tendai (2024) reported that Rwanda's business sector has undergone a notable transformation driven by the integration of modern technologies, particularly social media platforms. These tools have revolutionized how companies operate, market their services, and engage with customers. Simon (2024) reported that, as of early 2024, social media

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users in Rwanda made up approximately 6.5% of the total population. However, this figure may not reflect distinct individuals, as some users operate multiple accounts across platforms. The rapid growth of platforms like Facebook, X, Instagram, and LinkedIn has significantly transformed how businesses in Rwanda communicate with their audiences, shifting from traditional methods to more interactive, real-time engagement.

According to Mikalef and Pateli (2017), social media has the potential to drive innovation within firms by facilitating collaboration, idea exchange, and customer feedback integration. Despite its recognized importance and the widespread attention it receives, limited scholarly research has explored the strategic adoption of social media at the organizational level. Aula and Mantere (2018) further contended that corporate reputation is shaped not only through direct customer experiences and employee conduct but also through media portrayals and the narratives shared across social networks. These fragmented stories and perceptions collectively influence how stakeholders view a company.

This study, therefore, seeks to explore how MTN Rwandacell leverages social media publicity to influence public perception, strengthen brand credibility, and support long-term business sustainability in Rwanda's competitive telecommunications sector.

1.1 Statement of the Problem

Borgatti et al. (2018) argued, "Social media publicity plays a dual role in shaping corporate reputation, serving as both a strategic advantage and a source of reputational risk. Through real-time interactions and user-generated content, social media publicity has the power to influence public perception rapidly and significantly." In today's digital era, these platforms are central to corporate communication strategies, enabling businesses to engage with customers, disseminate information, and respond promptly to public concerns. For companies like MTN Rwandacell PLC, social media presents valuable opportunities to strengthen stakeholder relationships, build brand loyalty, and showcase transparency. However, these benefits are accompanied by substantial challenges, including the risk of negative publicity, misinformation, and public backlash, which can spread quickly and harm a company's image.

Kateri (2021) highlighted that a company's brand image is no longer exclusively managed by its marketing team; instead, it is shaped collaboratively with consumers on social media, where public opinion can shift rapidly based on shared experiences. Negative publicity, misinformation, and customer complaints can spread swiftly online, influencing public perception and corporate trust. This study aims to explore social media publicity implications on MTN Rwanda's corporate reputation by assessing its social media engagement strategies, customer perceptions, satisfaction levels, and brand loyalty.

1.2 Research Objectives

i. To assess the impact of social media publicity on MTN Rwandacell's corporate reputation.
ii. To examine contribution of social media publicity in enhancing stakeholder perceptions of MTN Rwandacell.
iii. To determine the role of social media publicity implications on customer loyalty.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Social Network Theory (SNT)

Networks serve as channels for the flow of information and resources, shaping how trust, influence, and innovation spread within and across communities" (Borgatti, et al., 2018). Social network theory (SNT) explores how social relationships impact how information is shared, the spread of media and personal influence, and the shaping of individuals' attitudes and behaviors (Wenlin et al., 2017). Given the highly interconnected nature of digital platforms, customers' attitudes toward a company are increasingly formed through peer interactions, influencer content, and community engagement. By applying SNT, businesses can better understand the pathways through which reputation is formed or influenced, and how strategic social media engagement can improve customer loyalty and trust. Furthermore, this framework supports identifying key influencers or network hubs that have disproportionate power in shaping brand narratives and consumer responses.

Nahapiet and Ghoshal (2017) defined a social network as a structured system made up of a limited number of actors (or entities) and the relationships that connect them. In this framework, nodes represent the individual participants or actors within the network, while ties signify the various forms of relationships or interactions among them. These ties can take many forms such as communication, collaboration, trust, or influence and collectively create a visual or conceptual map of the network. Social network diagrams often illustrate these structures, where the nodes are depicted as points and the ties as connecting lines. These representations can help identify patterns of interaction and even assess the social capital of individual actors that is, their potential value or influence within the network.

Unlike traditional sociological theories that emphasize personal attributes (like intelligence, personality, or behavior) to explain social outcomes, social network theory shifts the focus to relational dynamics. It suggests that what

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matters most is not who a person is, but whom they are connected to and how. Social Network Theory provides a framework for understanding how digital interactions create, sustain, and transform relationships, influencing trust, reputation, and information flow within online communities. (Borgatti, et al., 2018)

This theory was applied to this study to investigate how corporates can use social media to examine their customer perception, satisfaction and loyalty, and take measures or set policies according to customers' needs.

2.1.2 Social Capital Theory (SCT)

Social Capital Theory explains how trust, reciprocity, and shared values generated through online interactions contribute to organizational reputation and stakeholder loyalty (Nahapiet & Ghoshal, 2017). Human beings are inherently social creatures, shaped by evolution to thrive in communities. Our instincts naturally drive us toward cooperation, mutual support, and collective effort. The value we gain from these social connections and our willingness to act in the interest of others is what forms social capital**.** It stems from our unique human capacity to empathize, to work together, and to engage in acts of generosity and cooperation.

In a business context, this form of capital can be harnessed to strengthen trust, community engagement, and brand loyalty, especially through social media platforms where cooperative and relational dynamics flourish. Bourdieu (1986) described social capital as the sum of real or potential resources that stem from being part of a stable network of institutionalized relationships. In essence, it represents the value that individuals or organizations can access through their social connections and networks. In the digital era, firms build social capital through continuous engagement and transparency on social media, which in turn strengthens their perceived credibility and corporate reputation (Parveen, et al., 2016).

Corporate reputation in online networks is not only a result of strategic communication but also of the social capital embedded in relationships that promote trust and collective identity. This research utilized Social Capital Theory to explore the role of social media publicity in fostering customer loyalty and trust. By analyzing how digital interactions and engagement build relational value between companies and their customers, the study aimed to demonstrate how social capital formed via social media contributes to shaping a strong and positive corporate reputation.

2.2 Empirical Review

Social media is essential in influencing customer engagement with a business, directly affecting their involvement in marketing efforts. The frequency of customer visits to a company's online channels and their overall impression of the brand's reputation reflects the strength of the relationship between the business and its customers. Social media allows companies to maintain an ongoing conversation with their customers, which enhances involvement and loyalty. A company's active engagement with its audience on these platforms strengthens the emotional bond, resulting in increased trust and more frequent interactions. According to Obar and Wildman (2015), effective relationships with key stakeholders or influencers, businesses should follow the principle of progressive reciprocity. This involves offering something of value to the other party right from the beginning, rather than waiting until after assistance is requested.

Singh (2014) found that many companies are increasingly concentrating on strategic planning, which they define as the process of aligning an organization's goals, aims, and capabilities with evolving market opportunities. This strategic alignment is aimed at driving business improvement, increasing profitability, expanding market share, and enhancing overall organizational performance and reputation within the industry. Strategic planning serves as a proactive response to the rapidly changing market dynamics and helps businesses remain competitive and relevant. Social media has significantly transformed public relations practice globally. On the one hand, corporate reputation practitioners have been gifted with a global medium that instantly reaches a multitude at very little to no cost Tendai (2024).

III. METHODOLOGY

3.1 Research Design

Mixed methods are particularly well-suited for complex social phenomena, as they integrate both post-positivist and interpretivist perspectives, allowing for a nuanced and balanced interpretation of data (Maxwell, 1996). This approach combined the strengths of both quantitative and qualitative methodologies, enabling this research to explore the topic from multiple angles.

Maxwell (1996) argued that quantitative component enables the collection of data from a large and diverse sample, increasing the statistical power and generalizability of the findings across broader customer and employee base. Meanwhile, the qualitative aspect allows for an in-depth exploration of individual experiences, opinions, and perceptions, offering rich insights into how social media influences corporate reputation on a more personal level. As Kothari (2004) noted, quantitative data adds breadth while qualitative data adds depth—together creating a more holistic

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and comprehensive view of the issue under investigation. This research is specific and analytical which means that the researcher used facts and information already available, gather new data, and analyze them to make a critical evaluation. It used administered questionnaires to collect answers from respondents and documentation from MTN's reports.

3.2 Target Population

As stated by Sugiyono (2016: 80), a population refers to a broader category that includes objects or subjects sharing specific qualities and attributes determined by researchers for study and subsequent conclusion. This research targeted MTN Rwanda staff and customers in Kigali, Giporoso I. However, given the fact that it is impossible to conduct it with all MTN staff and customers, the researcher was limited to 50 MTN's staff members form Marketing and Sales department, and 232 customers.

3.3 Sampling Technique

Patton (2004) explained that sampling in research involves the process of selecting individuals, units, or settings for study. Pat (2004) emphasized that decisions related to sampling should align with the research objectives, particularly in terms of how the findings were generalized to a broader population. Purposive or judgmental sampling, as outlined by Maxwell (1996), is a method where specific individuals, settings, or events are deliberately chosen to provide valuable insights that might not be obtainable through other sampling methods. This strategy is particularly useful when researchers aim to gather in-depth information from a targeted group of participants, ensuring that the sample selected is directly relevant to the research question. This approach allows for a more focused investigation of specific phenomena, enabling researchers to draw meaningful conclusions based on carefully chosen sources.

The study population was determined using Yamane's (1973) formula, which is commonly applied when dealing with a finite and known population size. This formula provides a precise way to calculate an appropriate sample size, ensuring that the sample accurately represents the population while maintaining statistical reliability. By using this method, the researcher obtained a sample that is both manageable and sufficiently robust to draw meaningful conclusions.

Determining the sample size, Yamane Formula was given:

$$n = N / [1 + N (e2)]$$

Where:

n = Sample size
N = Total population size (954)
e = Error tolerance/Margin of error (5%)

Given: $N = 954$ and $e = (0.05)^2$

$$n = \frac{954}{1 + 954\ (0.05)}$$

$$n = \frac{954}{1 + 954\ (0.0025)}$$

$$n = \frac{954}{1 + 2.385}$$

$$n = \frac{954}{3.385}$$

Therefore, the sample size is **282**.

3.4 Data Collection Instruments

To gather relevant data for this study, the researcher utilized both questionnaires and interviews as data collection tools. This approach involves collecting two main types of data: primary and secondary. Primary data refers to firsthand information directly obtained from the participants through administered questionnaires and structured interviews. This type of data provides original insights into participants' opinions, behaviors, preferences, and demographic information, which are essential for achieving the research objectives (Sugiyono, 2016). On the other hand, secondary data comprises information that has already been collected, documented, or published for other research purposes but is deemed useful for the current study (Kothari, 2004).

3.5 Reliability and Validity of Instruments

Reliability and validity are essential components in the research methodology section, requiring clear yet accurate explanation. These concepts establish the credibility and rigor of a research study. Reliability refers to the consistency or repeatability of research findings over time, while validity concerns the accuracy and truthfulness of the

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results, as described by Altheide and Johnson (1994). In other words, reliability ensures that the results can be replicated under similar conditions, whereas validity evaluates whether the research truly measures what it intends to measure.

According to Patton (2004), the validity of a study relies not only on using established techniques, but also on how carefully and thoughtfully the research methods are selected and applied. In this study, the researcher ensured reliability by using standardized tools to collect unbiased data from both MTN employees and customers, as well as validated secondary data from MTN's official digital platforms and archived records. Singh (2014) emphasizes that strong reliability and validity enhance transparency in qualitative research and minimize potential researcher bias. Together, these elements support the trustworthiness and integrity of the research process and outcomes. In conclusion, the credibility or believability of this research is measured according to findings. The researcher coded and checked responses for errors, and data was entered into the computer for analysis and interpretation. The researcher analyzed and summarize objectives and research questions using tables, and charts through SPSS software.

IV. FINDINGS & DISCUSSIONS

4.1 Demographic Characteristics of Respondents

This study examined the demographic characteristics of respondents, as these factors often influence perceptions, attitudes, and engagement with social media and corporate reputation. Understanding who the respondents are was essential in contextualizing their views and experiences, since individuals of different age groups, genders, educational levels, and mostly used social media platforms may interpret and react to social media publicity in varied ways.

Table 1

Age Group of Respondents

Age Group	**Frequency**	**Percent**
18-25	65	28.0
26-30	39	16.8
31-40	84	36.2
Above 40	44	19.0
Total	**232**	**100.0**

Out of the 232 respondents, the age distribution shows that the largest group fell within the 31–40 years category, representing 36.2% of the sample. This was closely followed by those aged 18–25 years, who made up 28.0%, while respondents above 40 years accounted for 19.0%. The smallest proportion was from the 26–30 years group, comprising 16.8% of the participants. Cumulatively, 44.8% of respondents were 30 years and below, and a significant 81.0% were 40 years and below.

Table 1

Gender of Respondents

Gender	**Frequency**	**Percent**
Male	152	65.5
Female	80	34.5
Total	**232**	**100.0**

The table shows that out of 232 respondents, 152 (65.5%) were male while 80 (34.5%) were female. This indicates that men were the majority in the study, representing nearly two-thirds of the participants. The cumulative percentage shows that 100% of respondents were accounted for when both genders are combined, highlighting that the sample was male-dominated, though female voices still contributed significantly to the overall findings.

Table 3

Mostly Used Social Media by Respondents

Social Media Used	**Frequency**	**Percent**
X (Twitter)	84	36.2
LinkedIn	20	8.6
Instagram	96	41.4
Facebook	32	13.8
Total	**232**	**100.0**

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The cumulative results highlight that a large majority of respondents (77.6%) preferred visually engaging and conversational platforms like Instagram and X, underscoring the importance of these channels in shaping MTN's digital engagement strategy. Indeed, Sugiyono (2016) asserted that population characteristics guides researchers to understand deeper their audiences to ensure reliable findings.

4.2 Impact of Social Media Publicity on MTN Rwandacell's Corporate Reputation

Using a Likert scale (SD = Strongly Disagree, D = Disagree, N = Not Sure, A = Agree, SA = Strongly Agree), respondents expressed their level of agreement with statements designed to measure the extent to which social media publicity affects trust, credibility, and overall reputation of the company.

Table 4

Impact of Social Media Publicity on Corporate Reputation

Statement	SD	D	N	A	SA	Total	Mean
Interactive campaigns, promotional content, and community conversations, to strengthen its corporate reputation.	0 (0%)	0 (0%)	20 (8.6%)	112 (48.3%)	100 (43.1%)	232	4.34
Timely responsiveness to customer inquiries and complaints on social media platforms	0 (0%)	0 (0%)	25 (10.8%)	122 (52.6%)	85 (36.6%)	232	4.25
Adoption of two-way communication practices	0 (0%)	0 (0%)	35 (15.1%)	121 (52.2%)	76 (32.8%)	232	4.17
Consistent, transparent, and culturally relevant messaging	0 (0%)	9 (3.9%)	21 (9.1%)	117 (50.4%)	85 (36.6%)	232	4.21
Social media initiatives that highlight innovation, social responsibility	0 (0%)	0 (0%)	25 (10.8%)	122 (52.6%)	85 (36.6%)	232	4.25
Overall Mean						**232**	**4.25**

As illustrated in the table, the majority of respondents agreed or strongly agreed with all statements regarding the company's social media strategies. Specifically, 91.4% of respondents acknowledged that MTN's diverse engagement strategies, including interactive campaigns, promotional content, and community conversations effectively enhance its reputation, reflected in a mean score of 4.34. Similarly, 89.2% of respondents agreed or strongly agreed that timely responsiveness to customer inquiries and complaints on social media strengthens trust and reinforces the company's reliability (mean = 4.25). These outcomes are supported by Borgatti, et al. (2018) who noted that social media publicity has a strong and positive impact on its corporate reputation.

4.3 Contribution of Social Media Publicity in Enhancing Stakeholder Perceptions

Results narrowed the lens to explore how these digital engagements influence the attitudes, trust, and perceptions of key stakeholders, including customers, business partners, and the wider community. By using a Likert scale (SD = Strongly Disagree, D = Disagree, N = Not Sure, A = Agree, SA = Strongly Agree), the study captured respondents' views on MTN's efforts to communicate openly, address concerns, promote inclusivity, and foster confidence through social media channels.

Table 5

Contribution of Social Media Publicity and Stakeholder Perceptions

Statement	SD	D	N	A	SA	Total	Mean
Customer's perception on the company's brand image, shaping opinions on its reliability and trustworthiness.	0 (0.0%)	0 (0.0%)	22 (9.5%)	112 (48.3%)	100 (43.1%)	232	4.34
Positive publicity enhancement on customer satisfaction	0 (0.0%)	0 (0.0%)	19 (8.2%)	122 (52.6%)	85 (36.6%)	232	4.25
Social media messages effect on customer attitudes	0 (0.0%)	0 (0.0%)	22 (9.5%)	121 (52.2%)	76 (32.8%)	232	4.17
Addressing complaints, crises, and feedback through social media.	5 (2.2%)	3 (1.3%)	17 (7.3%)	117 (50.4%)	85 (36.6%)	232	4.21
Social media publicity as a key determinant of customer perception	0 (0.0%)	0 (0.0%)	22 (9.5%)	122 (52.6%)	85 (36.6%)	232	4.25
Overall Mean						**232**	**4.32**

A striking majority of respondents agreed or strongly agreed with the statements measuring this construct, with means ranging from 4.25 to 4.35. For instance, 90.5% of respondents confirmed that MTN's social media publicity

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influences how customers perceive its brand image, while only 9.5% remained undecided. Similarly, 91.8% of respondents indicated that positive publicity enhances satisfaction and loyalty. Results align with Mikalef and Pateli, (2017) who stated that negative publicity could damage confidence in the brand.

4.4 Role of Social Media Publicity Implications in Enhancing Customer Loyalty

Responding to inquiries, feedback, and mentions helps build relationships and foster customer loyalty. Interactive content like polls, surveys, and contests also encourage engagement. Customer loyalty represents a critical dimension of corporate sustainability, as loyal customers not only ensure consistent revenue but also act as ambassadors who amplify the brand's reputation.

Table 6

Social Media Publicity Implications and Customer Loyalty

Statement	SD	D	N	A	SA	Total	Mean
MTN Rwandacell's social media engagement effectiveness and customer loyalty	1 (0.4%)	4 (1.7%)	17 (7.3%)	110 (47.4%)	100 (43.1%)	232	4.31
Social media platforms fostering trust to enhance long-term customer loyalty	0 (0.0%)	0 (0.0%)	27 (11.6%)	115 (49.6%)	90 (38.8%)	232	4.27
Customer interest influenced by social media publicity	0 (0.0%)	4 (1.7%)	18 (7.8%)	110 (47.4%)	100 (43.1%)	232	4.32
Emotional connections with customers reinforced by social media publicity	1 (0.4%)	0 (0.0%)	17 (7.3%)	114 (49.1%)	100 (43.1%)	232	4.34
Social media engagement strategies positively impact customers' willingness to remain loyal to the brand.	1 (0.4%)	4 (1.7%)	17 (7.3%)	125 (53.9%)	85 (36.6%)	232	4.25
Overall Mean						**232**	**4.30**

Results revealed that MTN Rwandacell's social media publicity has a considerable role in fostering customer loyalty, as indicated by the consistently high levels of agreement across all statements. MTN's responsiveness to inquiries and its problem-solving strategies scored a strong mean of 4.27, as 49.6% agreed and 38.8% strongly agreed that such responsiveness fosters trust, which is the bedrock of long-term loyalty. The relatively low levels of uncertainty (only 11.6% not sure) in this statement further confirm that most customers recognize and experience MTN's proactive engagement online. These reactions concur with research conducted by Parveen et al. (2016) highlightitng that businesses use social media as a direct communication channel with their customers.

4.5 Social Media Publicity Implications and Corporate Reputation

Results clearly situates social media publicity as a critical interface between customer loyalty and corporate reputation. Results synthesize insights from the three objectives to assess the overall strategic role of social media in enhancing MTN Rwandacell's image, trustworthiness, and competitive positioning in Rwanda's telecom sector.

Table 7

Relationship between Social Media Publicity Implications and Corporate Reputation

Variables	N	Corporate Reputation (Obj.1)	Stakeholder Perceptions (Obj.2)	Customer Loyalty (Obj.3)
Corporate Reputation (Objective 1)	232	1	.726**	.694**
Stakeholder Perceptions (Objective 2)	232	.726**	1	.751**
Customer Loyalty (Objective 3)	232	.694**	.751**	1
Sig. (2-tailed)		.000	.000	.000
Pearson Correlation (r)		Strong Positive	Strong Positive	Strong Positive

The Pearson correlation coefficients indicate strong positive associations across the three research objectives, with values of .726 between social media publicity and corporate reputation, .751 between social media publicity and stakeholder perceptions, and .694 between social media publicity and customer loyalty. These figures highlight that improvements in MTN's social media strategies — such as transparency, responsiveness, and innovative engagement directly enhance its reputation, improve the way stakeholders perceive the company, and increase levels of customer loyalty. The statistical significance at the 0.01 level (Sig. = .000) further strengthens the reliability of these findings, confirming that the relationships observed are not by chance but reflect a consistent pattern in the perceptions of the respondents.

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Table 8
Analysis of Variance

ANOVA[a]					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	65.421	1	65.421	358.672	.000b
Residual	33.879	230	0.147		
Total	**99.300**	**231**			

a. Dependent Variable: Corporate Reputation b. Predictors: (Constant), Social Media Publicity

The findings indicate a regression sum of squares of 65.421 compared to a residual sum of squares of 33.879, out of a total sum of squares of 99.300. This distribution of variance highlights that the majority of the variation in corporate reputation is explained by social media publicity. The F-statistic value of 358.672 with a significance level (Sig.) of .000 strongly confirms that the model is statistically significant, meaning that social media publicity is a valid predictor of corporate reputation.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This study concludes that social media publicity substantially enhances stakeholder perceptions. The findings show that stakeholders view MTN more positively when the company actively engages with them through social media, addresses complaints and feedback promptly, and communicates in a transparent and culturally relevant manner. This reinforces the perception of reliability, professionalism, and customer-centeredness. Additionally, the research concludes that social media publicity plays a crucial role in fostering customer loyalty. The study demonstrates that effective social media engagement strengthens emotional connections, encourages long-term commitment, and enhances customer satisfaction. Stakeholders and customers recognize MTN's efforts to maintain consistent and interactive communication, which reinforces attachment to the brand and builds sustained loyalty.

5.2 Recommendations

Drawing from this study's findings, the research recommends that MTN Rwandacell and similar organizations should enhance their social media strategies to reinforce corporate reputation and stakeholder trust. Continuous investment in innovative, interactive, and culturally relevant campaigns will help sustain credibility and visibility. Active, real-time engagement should be prioritized to address stakeholder inquiries and feedback transparently. Additionally, content that highlights corporate values, social responsibility, and innovation will strengthen positive perceptions. In conclusion, integrating innovation, transparency, and responsiveness into all digital communications ensures that customers feel valued and are motivated to maintain long-term loyalty to the brand.

REFERENCES

Altheide, D. L., & Johnson, J. M. (1994). Criteria for assessing interpretive validity in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 485–499). SAGE.

Aula, P., & Mantere, S. (2018). *Strategic reputation management: Towards a company of good*. Routledge.

Borgatti, S. P., Brass, D. J., & Halgin, D. S. (2018). Social network research: Confusions, criticisms, and controversies. *Connections*, *37*(1), 13–21.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education* (pp. 241–258). Greenwood Press.

Kateri, Z. A. (2021). Impact of social media adoption on SMEs performance in Kano State, Nigeria. *International Journal of Management Science & Entrepreneurship, 17*(7), 141–160.

Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.

Maxwell, J. A. (1996). *Qualitative research design: An interactive approach*. (Applied Social Research Methods Series). SAGE Publications.

Mikalef, P., & Pateli, A. G. (2017). Social media for open innovation: A study of adoption determinants. In *Proceedings of the Pacific Asia Conference on Information Systems* (PACIS 2017), 219–232.

Nahapiet, J., & Ghoshal, S. (2017). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 42*(2), 223–240.

Obar, J. A., & Wildman, S. S. (2015). Social media definition and the governance challenge: An introduction to the special issue. *Telecommunications Policy, 39*(9), 745–750.

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Parveen, F., Jaafar, N. I., & Ainin, S. (2016). Social media's impact on organizational performance and reputation: The mediating role of social capital. *Information & Management, 53*(5), 740–751.

Pat, B. (2004). Issues in mixing qualitative and quantitative approaches to research. Western Sydney University.

Patton, M. Q. (2004). *Qualitative research & evaluation methods*. SAGE Publications.

Scott, J. (2017). *Social network analysis* (4th ed.). SAGE Publications.

Simon, K. (2024). Digital 2024: Rwanda. DataReportal.

Singh, A. S. (2014). Conducting case study research in non-profit organizations. *Qualitative Market Research: An International Journal, 17*, 77–84.

Sugiyono, P. (2011). *Metodologi penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.

Tendai, C. (2024). *Corporate reputation management: Opportunities and challenges in the social media age*. Routledge.

Ur Rahman, R., Ali Shah, S. M., El-Gohary, H., Abbas, M., Haider Khalil, S., Al Altheeb, S., & Sultan, F. (2020). Social media adoption and financial sustainability: Learned lessons from developing countries. *Sustainability, 12*(24), 10616.

Wenlin, L., Anupreet, S., Amanda, M., Beacom, & Thomas, W. V. (2017). Social network theory. University of Southern California.

Yamane, T. (1973). *Statistics: An introductory analysis* (3rd ed.). Harper and Row.

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Significant fibrosis burden among hepatitis C and human immunodeficiency virus co-infection among injection drug users [IDUs] from Mombasa County, Kenya

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ABSTRACT

Globally 36.7 million people have HIV, and in Kenya it is estimated that 1.5 million are infected. The HCV burden is estimated to be 32 million in sub Saharan Africa with Kenya having a prevalence of less <1%. In Kenya Injection Drug Users [IDU's] are estimated to be 50,000. There is increased public concern on the rising cases of injection substance users, which has also led to increased HIV prevalence in Mombasa County, which stands at 8.6%. This is above Kenya's prevalence rate, which is at 6.3%. Lymphopaenias among the HIV and HCV co-infected IDU's has also not been explored and therefore this study was aimed to address this gap. Through this study significant fibrosis and lymphopaenias among HIV- and HCV-co-infected injection substance users were determined. While HIV promotes acceleration of HCV infections towards fibrotic liver disease, HCV increases immunosuppression in HIV infections, leading to early acquired immunodeficiency syndrome (AIDS) and death in untreated cases. Liver disease related to hepatitis C virus (HCV) and human immunodeficiency virus (HIV) infection may affect the immune status of the injection substance users. Limited data exists on significant fibrosis and lymphopaenia among human immunodeficiency virus and hepatitis C virus co-infected injection drug users. This was a cross-sectional study involving consenting adult (≥18 years) IDUs at Bomu Hospital, Mombasa, Kenya. The study groups were HCV-/HIV- IDUs (n=114); HCV-/HIV+ IDUs (n=73); HCV+/HIV- IDUs (n=19); and HCV+/HIV+ co-infected (n=17). A total of 223 participants were recruited. Socio-demographic and clinical characteristics data were collected using a pre-tested structured participant questionnaire. Consenting participants were serologically screened for the hepatitis C virus and also screened for the human immunodeficiency virus using the national algorithm of testing. Immunological status was tested by the BD FACS Calibur flow cytometer. Immunologic staging was based on the CD4 count, where lymphopaenia was a count of <500 cells/µl. Platelets alongside aspartate aminotransferase (AST) and alanine aminotransferase (ALT) were also determined. The aspartate aminotransferase to platelet ratio index (APRI), fibrosis 4 index (FIB 4) and non-alcoholic fatty liver score (NAFLD) were used to determine significant fibrosis. APRI approached significant difference (P=0.054) across the groups. Age showed significance P 0.001 and gender P<0.0001. The AST levels across the groups are P=0.001. In immunological staging, lymphopaenia was more profound in HIV mono-infected injection drug users (65.8%), HCV/HIV co-infected injection substance users (41.2%), HCV/HIV uninfected (21.1%) and lastly HCV mono-infected injection substance users (15.8%). From the results it can be concluded that HCV/HIV co-infection among IDU's, is associated with high burden of significant fibrosis and lymphopaenia. Significant fibrosis was more pronounced across groups with HCV mono-infected IDUs leading, while lymphopaenia was most severe in HIV mono-infected IDUs (65.8%). The HCV/HIV co-infected burden of both significant fibrosis and lymphopaenia (41.2%) is progressively high. These findings highlight the profound impact of HIV and HCV on liver disease progression and immune suppression. This emphasises the urgent need for early screening, monitoring and integrated management of co-infected individuals to reduce morbidity and mortality in this vulnerable population.

Key Words: Biomarker, Co-Infection, Hepatitis C Virus, Injection Drug Users, Kenya, Mombasa County

I. INTRODUCTION

Human immunodeficiency virus (HIV) and hepatitis C virus (HCV) are transmitted mainly through intravenous route and penetrative sexual intercourse. Globally 37 million people are estimated to be living with HIV (Pandey & Galvani, 2019). The global HIV prevalence is 0.8%. In sub-Saharan Africa an estimated 25.5 million people are living with HIV. A vast majority estimated at 19 million people living with HIV are in East and Southern Africa (Kurth et al., 2015). In Kenya an estimated 1.5 million people are living with HIV. In terms of burden, Kenya is ranked fourth

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alongside Mozambique and Uganda. HIV prevalence in Kenya is at 6.3% and 78,000 new infections occur annually (Kurth *et al*., 2015). Mombasa County has a prevalence rate of 8.6%.

Hepatitis C is considered a global issue that mostly affects the developing countries (Roudot-Thoraval, 2021). HCV is a single stranded RNA virus belonging to the family flaviviridae. It has eleven major genotypes with genotype 1 being the most prevalent genotype globally (46%) followed by genotype 3 (22%) and genotype 2 and 4 (13%) each (Dhiman et al., 2016). The global burden of HCV is estimated at 130 – 180 million people. HCV has genotypes 1-11 with a variety of subtypes: a, b, c, and about 100 strains. The most widely distributed genotypes are 1-3 with genotypes 1a and 1b accounting for 60% of infections (Cepeda et al., 2022).

HCV is known to cause both chronic and acute infection in humans. HCV is considered a leading cause of chronic liver disease, the prevalence was lowest in Southern Africa (0.72 %), followed by Eastern Africa at 3.00 %, Western Africa at 4.14 %, and Central Africa at 7.82 %. Blood donors consistently had the lowest prevalence (1.78 %), followed by pregnant women (2.51 %), individuals with comorbid HIV (3.57 %), individuals from the general population (5.41 %), those with a chronic illness (7.99 %), and those at high risk for infection (10.18 %) (Mora et al., 2016).

1.1 Statement of the Problem

There is an increased public concern on the rising cases of injection drug users in the country. Injection substance use in the coastal region has been on the rise and this has led to increased prevalence of HIV and HCV. HIV and HCV co-infected injection drug users seem to bear the biggest burden of significant fibrosis and lymphopaenia (Trickey et al., 2019a). This has however not been established in previous studies done. As a result, there is need to address HIV and HCV among the co-infected so as to address the challenges in the diagnosis and management of this disease outcomes.

Significant fibrosis results to the impairment of the liver which results in a number of derangements in the body system which may lead to increased morbidity and mortality to the affected persons. Therefore, with increasing cases of injection drug use in the country together with HCV and HIV co-infection the cases of significant fibrosis could possibly be on the rise and therefore this study was aimed at addressing this gap.

Previous studies (Nelson et al., 2011; Sanvisens et al., 2011) have also shown that there is an association between HIV and lymphopaenia, but little has been done to determine the association between HCV and HIV co-infection, injection drug use and lymphopaenia. HCV infection is known to affect the liver, but in our case, there is also the aspect of injection drug use and HIV. The question that was being addressed by this study was to understand the effect of HCV and HIV co-infection, injection drug use and the progression of HCV and fibrosis.

1.2 Research objectives

i. To evaluate the burden of significant fibrosis (APRI >1.5) among HCV/HIV co-infected IDU's in Mombasa County, Kenya.
ii. To determine the prevalence of lymphopaenia (CD4 <500 cells/µl) among HCV/HIV co-infected IDU's in Mombasa County, Kenya.

II. LITERATURE REVIEW

The global situation of Human immunodeficiency virus (HIV) is that 36.7 million people are living with HIV at the end of 2015 (Mwatelah *et al*., 2015). The risks and incidents of HIV infection remain high among certain demographics globally, including IDU's, commercial sex workers (CSW) and men having sex with men (MSM) (Mwatelah *et al*., 2015).

Recent studies have shown an increase in HCV sero-prevalence over the last decade escalating to 2.8%, corresponding to an average of >185 million infections globally. An estimated 90% of global HCV burden is among the low to medium income countries where Kenya lies in. It has also been globally estimated that only 7% of the HCV diagnosed are initiated on treatment (Wadhva *et al*., 2018). HCV prevalence is at 5.3% and an estimated 32 million people are infected in sub Saharan Africa. Egypt has the highest prevalence in the world which is at 17.5% (Sonderup et al., 2017). In Kenya the prevalence is <1%.

2.1 Liver Fibrosis Infection

Fibrosis results from excessive accumulation of scar tissue which leads to inflammation of the liver cells. Microbial components which include lipopolysaccharide (LPS), lipoteichoic acid, and flagellin may promote liver fibrosis by the stimulation of HSCs and Kupffer cells with a LPS binding protein (LBP) and soluble CD14 (sCD14) (Chen et al., 2020).

Needle biopsy of the liver is the gold standard. It is however not risk free, lacks accuracy and many times patients are skeptical about the procedure. Serum biomarkers include single assessment or combined indexes such as

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APRI, FIB-4, NAFLD, AST/ALT ratio and Forns index. In this study APRI was used to test for significant fibrosis. APRI is a non-invasive score formula. Imaging modalities may be repeated where necessary. APRI is cheap, better tolerated, safer and more accessible to the patient than liver biopsy (Wang *et al.*, 2017). The aspartate aminotransferase to platelet ratio index (APRI) is recommended by the world health organization (WHO) for the assessment of the presence of liver fibrosis where liver biopsy is unavailable (Wandeler *et al*., 2016).

2.2 Platelets

The normal platelet count is 150-450*$10^{9/L}$ with a mean platelet diameter 1-2µ. They normally account for 8-16% of total blood count and they are indirectly related to the state of marrow production (Dinakaran et al., 2024). Platelets are multifunctional cells usually involved in initiation of atheroma, endothelial dysfunction and in the modulation of inflammatory and immune responses in a number of diseases (Hottz et al., 2018). Megakaryocytes transfer to platelets all cellular components responsible for their hemostatic immune functions and this includes granule stored chemokines. Megakaryocytes also display pattern recognition receptors (PRR) and cytokine receptors (Cunin & Nigrovic, 2019).

III. METHODOLOGY

3.1 Study Design and Population

This was a cross-sectional study involving consenting adult IDUs at Bomu Hospital, Mombasa, Kenya. The study population was among consenting injection substance users who are HCV mono-infected, HIV mono-infected and HCV/HIV co-infected.

3.2 Study Site

The study area was Mombasa County, Kenya in particular at Bomu Hospital. Mombasa County has a total area of 294.7 km^2 where land has an area of 229.7 Km^2 and water 65 $Km^{2.}$ The latitude is $3^0$56’ and $4^0$10’ south of equator and the longitudes are $39^0$34’ and $39^0$46^0 East.

3.3 Sample Size and Sampling Technique

Injection drug users were recruited via respondent- driven sampling (RDS), snowball and targeted street outreach (TSO) sampling method. The Cochran formula was used to determine the minimum sample size as follows:

$N=Z^2PQ/d^2$ $N=\frac{1.96^2 \text{ X } (0.183\text{X}0.817)}{0.05^2}$ =230

Where: N=the minimum sample size required, Z= Confidence level at 95 % (standard value of 1.96), P= prevalence of HIV among IDUs in Kenya of 18.3% (Waimar *et al.*, 2015) and, Q= (100-P)

The HIV prevalence for the HCV/HIV co-infection among PWID in Mombasa County was used since it is known. However, the prevalence of both HCV/HIV co-infection has yet to be established especially in Mombasa County.

3.4 Ethical Consideration

This protocol approved by Masinde Muliro University of Science and Technology Institutional Ethical Review Committee (MMUST-IREC) protocol number (MMU/COR: 403012 vol 2 (12). The National Council on Science and Technology (NACOSTI) licence number (NACOSTI/P/18/71025/23382) authorized the study. All participants signed consent forms.

3.5 Data Collection

Demographic, clinical, and laboratory data were collected. Clinical chemistry parameters included AST and ALT. Hematological parameters assessed included lymphocytes count, CD3, CD4, CD45 and platelet count.

3.6 Statistical Analysis

Data cleaning and coding was done using Microsoft Excel. Data analysis was done by use of SPSS version 20 (SPSS Inc. Chicago, IL). Graph pad prism (version 6) was also used for statistical evaluation of the data. Continuous data (age, laboratory measures) summarized as medians (IQR) and categorical data (gender, duration of injection) presented as proportions were tabulated. Statistical comparisons of the continuous data across the study groups were performed using non-parametric ANOVA (Kruskal Wallis) tests followed by Dunn’s post-hoc corrections for multiple comparisons. The continuous data for significant fibrosis and lymphopaenias was summarized as medians and interquartile range. The medians for significant fibrosis and lymphopaenias were then compared across groups by use of Kruskal-Wallis test followed by Dunn’s post hoc analysis for significant difference. *P* values <0.05 were considered significant.

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IV. FINDINGS & DISCUSSION

4.1 Response Rate

A total of 223 adults were recruited into the study. The study participants were categorized into the following four groups: 1) HCV and HIV co-infected (n=17); 2) HCV mono-infected (n=19); 3) HIV mono-infected (n=73) and HCV and HIV uninfected (n=114).

4.2 Demographic and Clinical Characteristics of the Study Participants

The demographic and clinical characteristics of the study participants were analyzed to determine significant differences between HCV+/ HIV+ IDU's; HCV-/HIV+ IDU's; HCV+/HIV- IDU's and HCV-/HIV- IDU's. Among the virus infected group, the proportion of males was higher HIV+/HCV+ co-infected IDU's (88.2%) and HCV+/HIV- IDU's (94.7%) compared to HCV-/HIV+ IDU's which had a higher proportion of females (67.1%); the HCV-/HIV- IDU's had a higher proportion of males (90.4%). Age was significantly different across the study groups (P=0.001). Subsequent post-hoc analysis showed that age was significantly higher in the HCV+/HIV+ co-infected (P<0.05) and HCV+/HIV- IDU's (P<0.01) relative to the HCV-/HIV+ IDU's group.

The most commonly used narcotic drug in all the study groups was heroin (88.2%, 94.7%, 65.8% and 90.4%) compared to cocaine (11.8%, 0.0%, 31.5% and 7.9%) and concomitant heroin-cocaine injection (0.0%, 5.3%, 2.7% and 1.8%) respectively in the HCV+/HIV+ co-infected IDU's, HCV+/HIV- IDU's; HCV-/HIV+ IDU"s and HCV-/HIV- IDU's group. Other injectable drugs such as diazepam and flunitrazepam were not being abused to a large extent. The use of the sedatives was reported among the study groups. Diazepam (5.9%, 10.5%, 8.2% and 7.0%) and flunitrazepam (0.0%, 10.5%, 0.0% and 4.4%) respectively in the HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's study group. In terms of duration of injection, injection drug users who had injected for ≥1 year had high proportions across all the groups (100%, 84.2%, 87.7% and 57.9%) respective for HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+IDU's and HCV-/HIV- IDU's. For the IDU's who had injected drugs for <1 year the proportions were (0.0%, 15.8%, 12.3% and 42.1%) respectively in the HCV+/HIV+ co-infected; HCV+/HIV- IDU's, HCV-/HIV+ IDU's and HCV-/HIV- IDU's.

Table 1

Demographic and Clinical Characteristics of the Study Participants

Characteristic	**HCV(-)/HIV(-), n=114**	**HCV(-)/HIV (+), n=73**	**HCV(+)/HIV (-), n=19**	**HCV(+)/HIV (+), n=17**	***P*-Value**
Age, yrs.	31.3 (9.4)	30.1 (86)	36.3 (12.4)[b]	34.3 (7.9)[a]	**0.001**
Gender, n (%)					
Female	11 (9.6)	49 (67.1)	1 (5.3)	2 (11.8)	-
Male	103 (90.4)	24 (32.9)	18 (94.7)	15 (88.2)	
Injection drugs, n (%)					
Cocaine	9 (7.9)	23 (31.5)	0 (0.0)	2 (11.8)	-
Heroin	103 (90.4)	48 (65.8)	18 (94.7)	15 (88.2)	
Cocaine+Heroin	2 (1.8)	2 (2.7)	1 (5.3)	0 (0.0)	
Others					
Diazepam	8 (7.0)	6 (8.2)	2 (10.5)	1 (5.9)	-
Flunitrazepam	5 (4.4)	0 (0.0)	2 (10.5)	0 (0.0)	-
Duration of injection, n (%)					
<1 year	48 (42.1)	9 (12.3)	3 (15.8)	0 (0.0)	-
≥1 year	66 (57.9)	64 (87.7)	16 (84.2)	17 (100.0)	
Frequency of injection, n (%)					
≤2 times/day	53 (46.5)	19 (26.0)	7 (36.8)	3 (17.6)	-
>2 times/day	61 (53.5)	54 (74.0)	12 (63.2)	14 (82.4)	
Non-injection drugs, n (%)					
Bhang	50 (43.9)	46 (63.0)	15 (78.9)	7 (41.2)	-
Brown sugar	18 (15.8)	14 (19.2)	3 (15.8)	1 (5.9)	-
Flunitrazepam	52 (45.6)	46 (63.0)	12 (63.2)	8 (47.1)	-
Diazepam	1 (0.9)	1 (1.4)	0 (0.0)	0 (0.0)	
Cigarettes	83 (72.8)	52 (71.2)	12 (63.2)	13(76.5)	-
Khat	19 (16.7)	27 (37.0)	3 (15.8)	4 (23.5)	-
Cocktail	24 (21.1)	39 (53.4)	6 (31.6)	6 (35.3)	-
Alcohol	23 (20.2)	45 (61.6)	3 (15.8)	9 (52.9)	-

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AST was significantly different across the study groups (P=0.001). Subsequent post-hoc analysis showed that AST levels were elevated HCV+/HIV- (P=0.001) and HCV-/HIV+ P<0.01 which was relative HCV+/HIV- IDU's. PRI approached significant difference across the study groups *(P*=0.054). The median was (0.46, 0.52, 0.35 and 0.43) respectively for HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's.

Significant fibrosis class II was predominant across all groups (29.4%, 47.4%, 21.9% and 36.8%) and fibrosis class III (0.0%, 5.3%, 6.8% and 3.5%) respectively for HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV-IDU's. Using the FIB4 biomarker there was no significant difference among the study groups. For Fib4 the negative results were shown (100%, 100%, 98.6% and 98.2%) respectively for HCV+HIV co-infected, HCV+/HIV-IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's group. Fib4 positive (0.0%, 0.0%, 1.4% and 1.8%) respectively for HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's. AFLD biomarker for the groups was (<-1.455) which shows no significant fibrosis across the study groups (100%, 100%, 100% and 100%) respectively for HCV+/HIV+ IDU's, HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's.

Table 2

Prevalence of significant fibrosis

Characteristic	**HCV(-)/HIV(-), n=114**	**HCV(-)/HIV+), n=73**	**HCV(+)/HIV(-), n=19**	**HCV(+)/HIV(+), n=17**	***P.* value**
AST, U/L	11.0 (11.0)	9.0 (6.0)	19.0 (14.0)	12.0 (7.0)	0.001
>ULNR					
Platelets ($\times10^3$/ µl)	259 (103)	268 (145)	306 (160)	296 (104)	0.079
<150×10^3/µl					
APRI, median (IQR)	0.43 (0.51)	0.35 (0.35)	0.52 (0.31)	0.46 (0.22)	0.050
Significant fibrosis, n (%)					
Class I	68 (59.6)	52 (71.2)	9 (47.4)	12.0 (70.6)	-
Class II	42 (36.8)	16 (21.9)	9 (47.4)	5.0 (29.4)	
Class III	4 (3.5)	5 (6.8)	1 (5.3)	0.0 (0.0)	
Fib 4	0.25 (0.20)	0.24 (0.20)	0.32 (0.24)	0.27 (0.18)	0.108
Negative Positive	112 (98.2) 2 (1.8)	72 (98.6) 1 (1.4)	19 (100) 0 (0.0)	17 (100.0) 0 (0.0)	-
NAFLD < 1.455	-71.65 (17.17) 114 (100.0)	-70.00 (12.85) 73 (100.0)	-83.00 (28.1) 19 (100)	-80.91 (15.3) 17 (100)	< 0.0001 -

Platelet absolute count (*10^6/ul) showed no significance difference among the medians (104, 160,145 and 103) respectively for HCV+/HIV+ IDU's; HCV+/HIV- IDU's; HCV-/HIV+ IDU's and HCV-/HIV- IDU's. This suggests that there is increased need to combine different markers for better diagnosis of significant fibrosis. Data shown are median (IQR) for AST and platelet and proportion for other categorical variables. AST, aspartate aminotransferase; APRI, aspartate aminotransferase to platelet ratio index (%). HCV+/HIV+, HCV+/HIV-, HCV-/HIV+ and HCV-/HIV- study groups. APRI <0.5, Class I; APRI ≥0.5<1.5, Class II and APRI >1.5, Class III.

Absolute lymphocytes were approaching significance across the study groups (P=0.05). Subsequent post-hoc analysis showed that absolute lymphocytes were elevated in HCV-/HIV+ (P=0.001) which was relative HCV-/HIV- individuals. CD45 absolute count showed significance across the study groups (P=0.001). Subsequent post-hoc analysis showed that CD45 absolute count was significantly higher in the HCV-/HIV+ (P=0.001) relative to the HCV-/HIV- individuals. CD3+CD45 absolute count showed significance across the study groups (P=0.05). Post hoc analysis showed CD3+CD45 was significantly increased in HCV-/HIV+ (P=0.05) as compared to HCV-/HIV-study individuals.

Table 3

Lymphocyte and lymphopaenia levels

Characteristic	**HCV(-)/HIV(-), n=114**	**HCV(-)/HIV+), n=73**	**HCV(+)/HIV(-), n=19**	**HCV(+)/HIV(+), n=17**	***P.* value**
Lymphocytes ×10^3/µl	2.4 (1.1)	2.2 (1.9)	2.1 (1.2)	2.4 (1.3)	0.021
Lymphocytes %	37.0 (15.2)	38.3 (19.0)	32.5 (14.7)	36.3 (14.4)	0.250
Lymphopenia, n (%)	14 (12.3)	18 (24.7)	5 (26.3)	2 (11.8)	-
CD45+µ/l	1982 (1229)	2410 (1062)	1685 (972)	2265 (1541)	<0.0001
CD3+CD45+×10^3/µl l	1682 (1020)	1609 (1424)	1342 (864)	1724.5 (1012)	0.001
CD3+CD4+CD45+×10^3/µl	23 (9)	31 (11)	21 (16)	36 (13.3)	0.001
CD3+CD4+ T cells ×10^3/µl	515 (1179)	891 (725)	337 (352)	938 (641)	<0.0001
CD3+CD4+ T cells %	78 (9.5)	73 (9)	72 (14)	71 (13)	0.031
Immunological staging					
Stage 1	5 (4.4)	18 (24.7)	0 (0.0)	0 (0.0)	
Stage 2	19 (16.7)	30 (41.1)	3 (15.8)	7 (41.2)	
Stage 3	90 (78.9)	25 (34.2)	16 (84.2)	10 (58.8)	

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Data are presented as numbers (n) and proportions (%). HCV+/HIV+, HCV+/HIV-, HCV-/HIV+ and HCV-/HIV- study groups. Stage 1 CD4+T cell <200; stage 2 ≥200<500 and stage 3 ≥500.

4.3 Discussion

Both AST and ALT may be used as indicators for liver damage or injury as a result of different types of disease conditions. Although it's not specific it can be used with other markers to diagnose significant fibrosis. Chronic HCV infection may result in slight elevation of both AST and ALT enzymes, these results in liver injury and even cirrhosis (Tamber et al., 2023).

With injecting drugs, this could possibly be aggravated and disease prognosis will be poor. This has been shown in other studies that injecting drugs raises the AST levels (Marks et al., 2022). AST was significantly elevated (P=0.001) among HCV+/HIV- PWID relative to the HCV-/HIV+ individuals. AST was also significantly elevated (P=0.05) in HCV-/HIV+ PWID compared to HCV-/HIV- individuals. This results correlates to a study by Langohr et al on liver enzyme alteration in HCV mono-infected and HCV+/HIV+ co-infected patients (Langohr et al., 2008).

The same elevated AST level was seen in HCV-/HIV+ IDU's. These may be attributed to the fact that HIV lowers person's immunity and as a result of injecting drugs e.g. cocaine, the effect of the drug may include and not limited to liver damage (Busca et al., 2022). APRI proved reliable in the diagnosis of significant fibrosis with median values and proportions ≥0.5 in the HCV+/HIV- IDU's. Despite the availability of a number of validated non-invasive indices such as FIB4 and APRI to aid in the evaluation of significant fibrosis, liver biopsy remains the gold standard for diagnosis (Wang *et al*., 2017). Although relatively safe the procedure is costly and not without risk.

APRI was used in this study and it has been proven to be reliable in a number of previous studies (Li *et al*., 2017). In this study we found out that platelet count, AST level and ALP levels were independent predictors of significant fibrosis (Wadhva *et al*., 2018). APRI class I <0.5 the average proportion was over 50% apart from the HCV+/HIV-IDU's where it stood at 47.4%. APRI class II was highest in the HCV+/HIV- IDU's however in APRI class III it was <7% across all the groups. APRI class II and class III combined had significant high proportion among the various groups; HCV+/HIV+ IDU's comprised 29%; HCV+/HIV- IDU's 54%; HCV-/HIV+ IDU's 29% and HCV-/HIV- IDU's at 40%. These could be as a result of injecting drugs which have an impact in bringing about liver degeneration.

Stage I (<200 CD4 T cells) was observed among the HCV-/HIV+ IDU's with a proportion of 24.7%. Our data also shows that <50% of the HCV-/HIV+ IDU's had CD4 T cell of ≥500. HCV+/HIV+ IDU's also showed reduced proportion of CD4 T cells with a majority (41.2%); HCV-/HIV+ IDU's (41.1%) at the intermediate stage i.e. stage II. The lymphopenia % among the HCV+/HIV+ IDU's (11.8%); HCV+/HIV-IDU's (26.3%); HCV-/HIV+ IDU's (24.7%) and HCV-/HIV- IDU's (12.3%). In the study (41.2%) had a CD4 count of <500 cells/ microl in the HCV+/HIV+ IDU's. These results corresponds with the study done by Singh et al on clinic-haematological profile and its correlation with CD4 counts and other related studies (Aleknavičiūtė-Valienė & Banys, 2022).

With lowered immunity, there is an increased risk of developing immune deficiency among IDU's who are more prone to multiple infections, particularly to HCV and HIV that share similar immune target cells (Waimar et al., 2015). Class III fibrosis was at 3.5% in the HCV-/HIV- IDU's as compared to the HCV+/HIV+ co-infected IDU's this may be associated with polydrug use of the various injectable drugs such as cocaine, heroin, flunitrazepam and diazepam which are all opioids. Opiate drug use through interactions with specific receptors has been shown to modulate antibody response, natural killer cell activity, T-cell development and expression of cytokines and chemokines both in vitro and in vivo. Initiation of HSC activation is associated with increase in several inflammatory cytokines which modulate collagen expression, including TGFβ1, TNFα, IL-1β and IL-6. Specifically, in HSCs, TNFα and IL-6 induce cellular trans-differentiation and activation, ultimately resulting in secretion of pro-fibrotic and proliferative factors, culminating in fibrosis. Since HCV and HIV have similar routes of transmission, co-infection in IDU's is common. This association is linked to long-term morbidity and mortality which is more than in mono-infection of either HCV or HIV.

V. CONCLUSION & RECOMMENDATION

5.1 Conclusion

This study has shown that there is high prevalence of significant fibrosis (29.4%) among HCV+/HIV+ IDU's. This correlates with a study done by Sanvisens et al where significant fibrosis (9.2% to 17.3%) among the co-infected IDU's. The estimation of significant fibrosis by use of non-invasive biomarkers may be helpful with clinical decisions to facilitate access to treatment of chronic HCV and significant fibrosis. These study highlights a substantial burden of significant fibrosis (29.4%) and CD4 based immunosuppression (41.2%) among PWID co-infected with HCV+/HIV+. The high prevalence of fibrosis underscores the urgency of early screening and treatment interventions. These findings reinforce the importance of integrated care models targeting both liver health and immunologic recovery in HCV+/HIV+ co-infected PWID; aiming to reduce morbidity and improve long term outcomes.

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5.2 Recommendation

It is necessary to scale up HIV and HCV diagnosis particularly in the IDU's population. There should be early initiation of DAA treatment, combined with improved testing, linkage to care and adherence. This will reduce HCV prevalence, significant fibrosis and morbidity among PWID. HCV+/HIV+ co-infected IDU's should be assessed for significant fibrosis by use of non-invasive biomarkers (APRI, FIB-4). In cases of advanced significant fibrosis or cirrhosis, HCC should be monitored to avoid having severe outcomes (Busca et al., 2022). Counseling services should also be enhanced so as to be able to make more IDU's to come out and seek therapeutic and treatment services. There should be comprehensive addiction care to PWID and are HCV+/ HIV+. There is need to combine behavioral, socio-demographic and serological data to inform the planning and implementation of effective prevention and intervention strategies.

CONFLICT OF INTEREST

None of the authors have a conflict of interest as part of this study.

REFERENCES

Aleknavičiūtė-Valienė, G., & Banys, V. (2022). Clinical importance of laboratory biomarkers in liver fibrosis. *Biochemia Medica, 32*(3), 346–356. https://doi.org/10.11613/BM.2022.030501

Busca, C., Sánchez-Conde, M., Rico, M., Rosas, M., Valencia, E., Moreno, A., Moreno, V., Martín-Carbonero, L., Moreno, S., Pérez-Valero, I., Bernardino, J. I., Arribas, J. R., González, J., Olveira, A., Castillo, P., Abadía, M., Guerra, L., Mendez, C., & Montes, M. L. (2022). Assessment of noninvasive markers of steatosis and liver fibrosis in human immunodeficiency virus-monoinfected patients on stable antiretroviral regimens. *Open Forum Infectious Diseases, 9*(7), ofac279. https://doi.org/10.1093/ofid/ofac279

Cepeda, J. A., Thomas, D. L., Astemborski, J., Rudolph, J. E., Gicquelais, R., Kirk, G. D., & Mehta, S. H. (2022). Impact of hepatitis C treatment uptake on cirrhosis and mortality in persons who inject drugs. *Annals of Internal Medicine, 175*(8), 1083–1091. https://doi.org/10.7326/M21-3846

Chen, X., Liu, X., Duan, S., Tang, R., Zhou, S., Ye, R., Yang, Y., Wang, J., Yao, S., & He, N. (2020). Plasma inflammatory biomarkers associated with advanced liver fibrosis in HIV–HCV-coinfected individuals. *International Journal of Environmental Research and Public Health, 17*(24), Article 24. https://doi.org/10.3390/ijerph17249474

Cunin, P., & Nigrovic, P. A. (2019). Megakaryocytes as immune cells. *Journal of Leukocyte Biology, 105*(6), 1111–1121. https://doi.org/10.1002/JLB.MR0718-261RR

Dhiman, R. K., Satsangi, S., Grover, G. S., & Puri, P. (2016). Tackling the hepatitis C disease burden in Punjab, India. *Journal of Clinical and Experimental Hepatology, 6*(3), 224–232. https://doi.org/10.1016/j.jceh.2016.09.005

Dinakaran, P., Rajkumar, A., Mohan, N., Parthasarathy, S., & Jayaraman, V. (2024). Evaluation of platelet counts and associated factors using statistical methods. *2024 First International Conference on Innovations in Communications, Electrical and Computer Engineering (ICICEC), 7*(4), 1–9. https://doi.org/10.1109/ICICEC62498.2024.10808228

Hottz, E. D., Bozza, F. A., & Bozza, P. T. (2018). Platelets in immune response to virus and immunopathology of viral infections. *Frontiers in Medicine, 5*(8), 45. https://doi.org/10.3389/fmed.2018.00121

Kurth, A. E., Cleland, C. M., Des Jarlais, D. C., Musyoki, H., Lizcano, J. A., Chhun, N., & Cherutich, P. (2015). HIV prevalence, estimated incidence, and risk behaviors among people who inject drugs in Kenya. *Journal of Acquired Immune Deficiency Syndromes, 70*(4), 420–427. https://doi.org/10.1097/QAI.0000000000000769

Langohr, K., Sanvisens, A., Fuster, D., Tor, J., Serra, I., Rey-Joly, C., Rivas, I., & Muga, R. (2008). Liver enzyme alterations in HCV-monoinfected and HCV/HIV-coinfected patients. *The Open AIDS Journal, 2*, 82–88. https://doi.org/10.2174/1874613600802010082

Li, Q., Ren, X., Lu, C., Li, W., Huang, Y., & Chen, L. (2017). Evaluation of APRI and FIB-4 for noninvasive assessment of significant fibrosis and cirrhosis in HBeAg-negative CHB patients with ALT ≤ 2 ULN: A retrospective cohort study. *Medicine, 96*(12), e6336. https://doi.org/10.1097/MD.0000000000006336

Marks, L. R., Nolan, N. S., Liang, S. Y., Durkin, M. J., & Weimer, M. B. (2022). Infectious complications of injection drug use. *Medical Clinics, 106*(1), 187–200. https://doi.org/10.1016/j.mcna.2021.08.006

Mora, N., Adams, W. H., Kliethermes, S., Dugas, L., Balasubramanian, N., Sandhu, J., Nde, H., Small, C., Jose, J., Scaglione, S., & Layden, J. E. (2016). A synthesis of hepatitis C prevalence estimates in Sub-Saharan Africa: 2000–2013. *BMC Infectious Diseases, 16*(1), 283. https://doi.org/10.1186/s12879-016-1584-1

Mwatelah, R. S., Lwembe, R. M., Osman, S., Ogutu, B. R., Aman, R., Kitawi, R. C., Wangai, L. N., Oloo, F. A., Kokwaro, G. O., & Ochieng, W. (2015). Co-infection burden of hepatitis C virus and human immunodeficiency virus among injecting heroin users at the Kenyan Coast. *PLoS ONE, 10*(7), e0132287. https://doi.org/10.1371/journal.pone.0132287

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Nelson, P. K., Mathers, B. M., Cowie, B., Hagan, H., Des Jarlais, D., Horyniak, D., & Degenhardt, L. (2011). Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: Results of systematic reviews. *Lancet, 378*(9791), 571–583. https://doi.org/10.1016/S0140-6736(11)61097-0

Pandey, A., & Galvani, A. P. (2019). The global burden of HIV and prospects for control. *The Lancet HIV*, *6*(12), e809–e811. https://doi.org/10.1016/S2352-3018(19)30230-9

Roudot-Thoraval, F. (2021). Epidemiology of hepatitis C virus infection. *Clinics and Research in Hepatology and Gastroenterology*, *45*(3), 101596. https://doi.org/10.1016/j.clinre.2020.101596

Sanvisens, A., Fuster, D., Serra, I., Tor, J., Tural, C., Rey-Joly, C., & Muga, R. (2011). Estimated liver fibrosis and its impact on all-cause mortality of HCV-monoinfected and HCV/HIV-coinfected drug users. *Current HIV Research*, *9*(4), 256–262. https://doi.org/10.2174/157016211796320298

Sonderup, M. W., Afihene, M., Ally, R., Apica, B., Awuku, Y., Cunha, L., Dusheiko, G., Gogela, N., Lohouès-Kouacou, M.-J., Lam, P., Lesi, O., Mbaye, P. S., Musabeyezu, E., Musau, B., Ojo, O., Rwegasha, J., Scholz, B., Shewaye, A. B., Tzeuton, C., … Spearman, C. W. (2017). Hepatitis C in sub-Saharan Africa: The current status and recommendations for achieving elimination by 2030. *The Lancet Gastroenterology & Hepatology*, *2*(12), 910–919. https://doi.org/10.1016/S2468-1253(17)30249-2

Tamber, S. S., Bansal, P., Sharma, S., Singh, R. B., & Sharma, R. (2023). Biomarkers of liver diseases. *Molecular Biology Reports*, *50*(9), 7815–7823. https://doi.org/10.1007/s11033-023-08666-0

Trickey, A., Fraser, H., Lim, A. G., Peacock, A., Colledge, S., Walker, J. G., Leung, J., Grebely, J., Larney, S., Martin, N. K., Hickman, M., Degenhardt, L., May, M. T., & Vickerman, P. (2019). The contribution of injection drug use to hepatitis C virus transmission globally, regionally, and at country level: A modelling study. *The Lancet Gastroenterology & Hepatology*, *4*(6), 435–444. https://doi.org/10.1016/S2468-1253(19)30085-8

Wadhva, R. K., Haque, M. M., Luck, N. H., Tasneem, A. A., Abbas, Z., & Mubarak, M. (2018). Diagnostic accuracy of aspartate aminotransferase to platelet ratio index and fibrosis 4 scores in predicting advanced liver fibrosis in patients with end-stage renal disease and chronic viral hepatitis: Experience from Pakistan. *Journal of Translational Internal Medicine*, *6*(1), 38–42. https://doi.org/10.2478/jtim-2018-0008

Waimar, T., Meredith, S., Dita, B., Jerry, O., Nicholas, M., Fisher, R. H., Helgar, M., Andrea, K. A., Mercy, M., & Scott, G. (2015). HIV and STI prevalence and injection behaviors among people who inject drugs in Nairobi: Results from a 2011 bio-behavioral study using respondent-driven sampling. *AIDS and Behavior*, *19*(Suppl 1), 24–35. https://doi.org/10.1007/s10461-014-0936-3

Wandeler, G., Mulenga, L., Vinikoor, M. J., Kovari, H., Battegay, M., Calmy, A., Cavassini, M., Bernasconi, E., Schmid, P., Bolton-Moore, C., Sinkala, E., Chi, B. H., Egger, M., Rauch, A., & IeDEA-Southern Africa and the Swiss HIV Cohort Study. (2016). Liver fibrosis in treatment-naïve HIV-infected and HIV/HBV co-infected patients: Zambia and Switzerland compared. *International Journal of Infectious Diseases, 51*, 97–102. https://doi.org/10.1016/j.ijid.2016.08.028

Wang, H.-W., Peng, C.-Y., Lai, H.-C., Su, W.-P., Lin, C.-H., Chuang, P.-H., Chen, S.-H., Chen, C.-H., Hsu, W.-F., & Huang, G.-T. (2017). New noninvasive index for predicting liver fibrosis in Asian patients with chronic viral hepatitis. *Scientific Reports, 7*, Article 3589. https://doi.org/10.1038/s41598-017-03589-w

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The implications of Christian aid reception by Muslims on Christian-Muslim relations in Isiolo County, Kenya

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ABSTRACT

Christian aid in Kenya has also been both a tool of hope and a point of tension in intra-faith relations, as some of the society welcomed it with open arms, others in doubt, while others received it conditionally on terms negotiated. The central objective of the study was to examine the effects of reception styles of Christian Aid on Christian-Muslim relations in Isiolo County with the following specific research objectives: to examine the effect of grateful acceptance of Christian Aid on Christian-Muslim relations in Isiolo County, to examine the effect of suspicion of Christian Aid on Christian-Muslim relations in Isiolo County, and to examine the effect of conditional acceptance of Christian Aid on Christian-Muslim relations in Isiolo County. Two theories (Social Identity Theory and Theory of Intergroup Contact), which are most relevant to the dynamics of Christian aid among Muslim communities, guided this study. A qualitative descriptive case study in Osmer's Practical Theology Model was used in the research. Descriptive statistics, cross-tabulation, and binary logistic regression were used for the data, and qualitative data were coded thematically to bring contextual depth and triangulation. Study sampling design qualifications that were sampled in an attempt to attain an equal and representative study respondents' sample of the target population that consisted of 2,230 members of Isiolo County's local Muslim population. The target population was stratified into six Christian humanitarian organizations that run activities in Isiolo County and offer aid. Stratification was conducted to make sure the sample reflected members of the Muslim community and, by default, are beneficiaries of aid from Christian organizations in Isiolo County. Questionnaires were the principal tools in data collection, which was quantitative. Three common reception patterns of aid were found. The first was acceptance with gratitude, and respondents and leaders both came out openly and mentioned the benefits of Christian relief, particularly during times of crisis such as drought and famine. Gratitude also had a strong association with improved Christian–Muslim relations because it prompted cooperation, trust, and the community's participation in development projects. Suspicion and fearfulness were the usual problems, according to memories of relief associated with missionaries, fear of religious conversion, and shared rumors. Such stereotypes once discouraged the community from joining aid programs, and they preferred receiving the assistance anonymously, thereby eroding interfaith trust. Conditional acceptance was a reaction that mirrored the realist response in the sense that the community demanded firmly, negotiated with relief agencies, and oversaw the relief distribution with the purpose of providing cultural and religious legitimacy. The study recommends greater transparency in aid provision, open forums for interfaith dialogue, compliance with community terms, and institution-building for participatory monitoring.

Keywords: Christian Relief, Interfaith Relations, Isiolo County, Acceptance, Wariness and Suspicion

I. INTRODUCTION

Worldwide, Christian relief has generally encountered ambivalent responses depending on historical, cultural, and religious contexts. In Europe and North America, organizations such as World Vision, Caritas, and Catholic Relief Services are commonly accepted as legitimate humanitarian organizations. Their conduct has been broadly perceived as a show of Christian social responsibility and not proselytism, and that has allowed them to engage closely with governments, multilateral bodies, and civic groups (De Lauri & Turunen, 2022, p. 44).

In other parts of Asia, however, such as India and Pakistan, Christian relief is occasionally confronted with suspicion owing to concerns about conversion and legacy of colonialism. Even in the Middle East, where religious affiliations are politicized, Christian relief organizations have at times struggled to live down suspicion despite performing simplest of services. Yet, internationally, Christian Non-Governmental Organizations [NGOs] are accorded respect as pivotal players in humanitarian intervention and development with their reputation grounded on professionalism, impartiality, and serving the poorest (Kemp, 2023, p. 312).

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In Somalia, to name one example, Christian humanitarian work has sometimes been seen as being forced upon them and accused of having hidden religious agendas. However, despite such hindrances, Christian NGOs are much valued for trying to address needs such as famine, war, and displacement, and have effectively crossed religious lines by meeting human needs. There exists a dynamic Christian relief tradition in Kenya dating back to missionary days when hospitals and schools were established in the spirit of evangelization as well as social action. Today, the likes of Caritas Kenya, World Vision, and Anglican Church of Kenya Development Services remain main providers in the areas of health, education, disaster relief, and livelihood. While at times religious motives for aid are questioned, the general level of tolerance has been good. Christian organizations are generally regarded as reliable partners for gap-filling by government, particularly in far-flung and periphery areas (Ager et al., 2019, p. 72)

In Isiolo County, Christian aid takes on eerie significance. The county, with a population of about 268,000 people, is composed mainly of Muslims (69%) and is ethnically diverse, comprising Borana, Somali, Turkana, Rendille, Samburu, and Meru communities **(**Kenya National Bureau of Statistics [KNBS], 2019, p. 45). The county is a previously marginalised and socio-economically disadvantaged region whose economy is mainly pastoralism and whose principal cause of long-term food insecurity, negative health outcomes, and limited access to education is cyclic drought. Ever since the 1990s, Christian organizations such as Caritas Isiolo have attempted to deal with such issues by providing food aid, water projects, medical care, and livelihood schemes. While many Muslims in Isiolo have appreciated such assistance, especially if it is directed towards the weaker sections of society such as women, children, and the elderly, religious difference has provided the motivation for a sub-surface suspicion. Received in bulk, Christian reception of aid in Isiolo mirrors the broader international and continental patterns: valued for its material assistance to human welfare but sometimes controversial through suspicion of religious activity and identity. This study hence sought to explore how Christian reception of aid by Muslims in Isiolo influences Christian–Muslim relations, and what this implies for building trust, living together, and development in the region.

1.1 Statement of the Problem

Isiolo County in Kenya's semi-arid northern region provides a complex environment for Christian NGOs to provide humanitarian assistance in the predominantly Muslim environment. The demographic configuration of the region, which is marked by Muslim prevalence and presence of sizable Borana ethnic groups, brings religious and cultural factors that tremendously influence how humanitarian assistance is received. One of the most obvious issues is twinned reception of assistance, which is usually characterised by suspicion and mistrust fuelled by past grievances, theological conflicts, and apprehensions about proselytization. Such perceptions have the potential to undermine participation in the community and the success of aid interventions.

Assistance is also usually received on the understanding that it can be delivered only through local Muslim groups or guarantees of non-religious engagement, thereby inhibiting the capacity of Christian non-governmental organisations to implement it. Even where assistance is willingly and gratuitously extended, reaction is ambiguous in the community; whereas a few see it as a true expression of solidarity, others do so suspiciously or politically. Such challenges highlight the need for culturally sensitive, trust-building approaches. This study will examine these trends to optimize the benefit of faith-based relief response and foster Christian-Muslim relations in Isiolo and globally.

1.2 Research Objectives

i. To examine the effect of grateful acceptance of Christian Aid on Christian-Muslim Relations in Isiolo County.
ii. To assess the effect of suspicion and wariness towards Christian Aid on Christian-Muslim Relations in Isiolo County.
iii. To investigate the effect of conditional acceptance of Christian Aid on Christian-Muslim Relations in Isiolo County.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Social Identity Theory

Social Identity Theory (SIT) by Henri Tajfel and John Turner in the 1970s supposes that individuals construct a part of their identity through group membership and that these group memberships influence their attitudes and behaviors towards other individuals (Tajfel & Turner, 1986). Forming an "in-group" (us) and an "out-group" (them), SIT demonstrates how in-group solidarity can be the origin of suspicion or prejudicing towards individuals who are not in the same group.

In Christian relief in Isiolo, SIT illuminates why Muslims sometimes distrust Christian organizational relief suspiciously. Since donors of aid belong to an out-group stereotype, everything that they do shall have agenda motives like proselytizing or intrusiveness into culture. SIT also describes how positive experience seeps through such barriers

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and creates new knowledge of the out-group. Strength of SIT is that it can be used to explain how identity affects delivery of aid and is therefore very useful in religiously diverse settings. Weakness is that it focuses too much on conflict and division and falls short of explaining the challenge of getting over the divisions.

2.1.2 The Theory of Intergroup Contact

The Intergroup Contact Theory, initially founded by Gordon Allport in 1954, suggests that in the best circumstances of equal standing, common aims, collaboration, and support for institutions, contact would bring together various groups by lowering prejudice and enhancing the relations between them. This hypothesis relies on the fact that where Muslim aid recipients and Christian aid workers work together in such community activities as water projects, health projects, or education projects, they develop trust and stereotypes are alleviated.

In being a source of shared experience, aid is not only an exercise of humanity but a source of further inter-faith encounter. Strength of theory is that it is so positioned in scope: it addresses circumstances under which constructive contact will take place. Weakness is that these circumstances may not exist in vulnerable or marginal environments where power inequalities and distrust prevail. Contact itself, under the specified circumstances, may fail to eliminate prejudice.

2.2 Empirical Review

2.2.1 Grateful Acceptance

Dickens (2017, p. 200) wrote about verbal description of gratitude and its effect on Christians-Muslim relations. The results were that communities that thanked the donors always had better Christian-Muslim relations. The positive effect was described in how verbal gratitude led to religious bridging as well as orientations towards cooperation. Involvement of communities in activity that involves aid has been researched extensively. Dickens (2017, p. 202) reiterated that extremely high levels of engagement in aid activity, volunteering, and distribution would be needed to improve interfaith relations. Dickens required in his research that increased Muslim community engagement in these activities of aid were linked with improved relations with Christian NGOs. This level of interaction facilitated greater cooperation and understanding. Ekezie (2022, p. 15) also explored the latent meaning of expressed gratitude toward the Nigeria long-term aid relationships

Experiments had proven that long-term expressed gratitude was related to longer and more collaborative relations between Christian agencies and whom they were serving. Long-term appreciation allowed long-term partnership and trust. Ekezie (2022, p. 16) also explored the effect of involvement of individuals on long-term aid impact. The study recognized that active participation of community members in relief work would produce long-term partnership projects between Christian NGOs and target local communities. Proximity promoted short-term relief provision but also enhanced longer-term collaboration. Popular support by local leaders also remained a dominant feature in Christian-Muslim relations. Ssetuba (2024, p. 118) did research on the acceptance role of the local Muslim leaders in the Christian aid acceptance on people with HIV/AIDS in Uganda. It was revealed in the study that if the local leader accepted and appreciated the aid openly, it was equivalent to goodwill in Christian agencies' contexts. Endorsements, in such a manner, helped towards having started establishing trust as well as having facilitated interaction between the donor and the community to become easier.

In Kenya, Alio (2015, p. 299) had previously shown that support from local Muslim leaders positively affected the embrace of Christian aid in Tana River County. Popular consent and acceptance by appreciation leaders, their study found, helped in upholding positive relations and successful activities of aid. Nyongesa (2019, p. 309) focused on Kenya and analyzed the role that appreciation played in an attempt to spur long-run cooperation. The research proved that appreciative communities would also develop long-run projects with community organizations. The long-run commitment was a result of the positive effect of appreciation in creating cooperation and respectfulness towards each other.

2.2.2 Suspicion and Wariness

Gutkowski and Larkin (2021, p. 1060) so vividly captures this dynamic and illustrates that a supermajority, well over 65% of Syrian Muslim aid recipients, were "very concerned" that the provision of aid would be tied to proselytism attempts. That suspicion is especially corrosive where religious conservativism is strong and Islamic identity purity is jealously protected. The degree of fear has been enough to make individuals open to guarded engagement with Christian relief organizations, with some going out of their way to use Muslim-owned or state-owned facilities even where the latter is not the custom.

In Indonesia, Nur Syam and Ahida (2025, p. 50) reports that as many as 50% of individuals in parts of Aceh were "somewhat concerned" that Christian aid was a covert effort at religious conversion. Suspicion is not unwarranted, however, since the presence of foreign Christian NGOs in predominantly Muslim populations has sometimes been linked to heterodox religious teachings. Assumptions are again intermingled with local memory of missionary incursion

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into the region, one which puts a discredit-ing taint on its humanitarian work until today. Likewise, in Indonesia's Aceh in rural Indonesia, there is reciprocal restraint. Most recipients do not want to be helped anonymously or confidentially so that they will not be openly stigmatized as having any connection with Christian relief agencies and thereby boycotted or blamed for apostasy Gutkowski and Larkin (2021, p. 1060). Individuals do not wish to be identified as being part of Christians in the public sphere, and it will stigmatize them, especially with the surrounding rural local communities since there is strong social solidarity.

The same suspicion was raised in Ethiopia, and even more so in the Somali province. Weldu and Nyanchoga, (2024, P. 223) quotes that at best 45% of Muslims were "somewhat concerned" about Christian aid motives. This is because they are aware that the Christian agencies are using human development aid as a tool of proselytism and are fearful because Christian mission history in the country has done just that. Christian-Muslim polarisation has to an exceedingly large extent shaped the nature of aid in Nigeria. Among the Christians, who are predominant in the north, Afolaranmi (2020, p. 242) observed that Christian assistance is openly shown as a way of trying to convert individuals to Christianity. The individuals are so wary about this, and 52% of the interviewees had already stated that they were already "very concerned" about religious elements of receiving Christian agency assistance.

This is also a suspicion that is corroborated by the fact that the sectarian tensions within the region religious sensitivities, were running high. Christian relief agencies have been under suspicion in Kenya, particularly in Kenya's coastal regions that are predominantly Muslim. Green, (2020, p. 34) also demonstrates how Kenyan Muslims did not want to be given Christian relief as an adjunct to religious conversion programs. This is the legacy of the missionaries' activities in the area and combined with the prevailing socio-economic challenges of the country. Even among the northern parts of Kenya where there is Islamic predominance, the same has been seen. Ager et al. (2019, p. 72) confirms that 50% of Muslims indicated they were "somewhat concerned" about Christian aid's agenda. These are motivated by the belief that Christian agencies can use humanitarian aid as a means of proselytization and have had reason for this based on historical Christian missions in the country.

2.3.3 Conditional Acceptance

Most at risk is the political climate in Myanmar, the Rohingya crisis notwithstanding, where Muslim communities have been forcibly repressed. Christian relief organizations, in the massively competitive provision of relief, are regularly confronted with suspicion and distrust. Muslim society and the Rohingya specifically, have made relief conditional. Conditions typically require that Christian relief workers avoid religious symbols and relief provided is not requested by religious trappings (Kipgen, 2020, p. 55). Conditional tolerance is a term used to describe natural suspicion on the part of the community towards religious intervention or activity within humanitarian agendas of conversion process. Record and documentation of such incidents within community covenant is actually a documentation of levels of religious sensibility within relief intervention.

Similarly, the same patterns of conditional acceptance are observed where Christian organizations have been involved for decades. There is aid that is given with the promise that it would be dispensed on a non-sectarian basis, and even in some, there is Islamic local leadership that has some role to play in the distribution process of the delivery (Khafagy, 2020, p. 9). Such intervention by the local religious leaders is regarded as a prevention of the risk of religious conversion and an effort to Islamize the relief being offered. The conditions under which those types of communities, substantiated at large in interview and testimony with such community leaders, would accept Christian relief pass some qualitative threshold of suspicion that can be far below givers and takers of relief.

Christian relief in Yemen, where war has ravaged much of the country, is provided for the most part on the condition that any such-so-called religious symbols or markers are not used. Where territory is controlled by Islamic extremist groups, strict stipulations are put in place that aid is provided in a manner that will not undermine the group's religious ideology (Elayah & Al-Awami, 2024, p. 2271). The needs are pushed to their limits by contract conditions and with respect to the type of religious conversion that is taken into account. The prevalence of the diseases, as witnessed in the history of conformity of the community and through interviews, are indicators of the greatest challenge Christian relief agencies face in providing their services without evident religious strife.

III. METHODOLOGY

3.1 Research Design and Approach

The study employed qualitative descriptive case study design supported by the Osmer's Practical Theology Model. Qualitative research was adopted because the study critically sought to investigate Muslim societies in everyday life, meaning, and response to Christian aid. Unlike number-counting quantitative research designs, the qualitative research provided room for the researcher to have wiser attitude, meaning, and relational dynamics to receive aid and interfaith. This was the suitable design because the research was confined to one geographical area (Isiolo County) and examined the precise same dynamics among Muslim societies and Christian relief agencies therein. Selecting Isiolo

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alone enabled the research to come up with highly precise and context-specific results that were not otherwise easily available through more expansive survey methods.

3.2 Sampling Strategy

Study sampling design qualifications that were sampled in an attempt to attain an equal and representative study respondents' sample of the target population that consisted of 2,230 members of Isiolo County's local Muslim population. Target population was stratified into six Christian humanitarian organizations that run activities in Isiolo County offering Aid. Stratification was conducted to make sure the sample reflected members of the Muslim community and by default are beneficiaries of aid from Christian organizations in Isiolo County. The following are some of the organizations used in the present study: Caritas Isiolo, Catholic Relief Services (CRS), World Vision, Merti Integrated Development Programme (MID-P), Christian Aid, and Pastoralist Women for Health and Education (PWHE). Muslim beneficiaries were identified in all the strata who were being assisted by one of the said Christian NGOs. In this manner, it was possible to conduct chosen sampling from the ones who directly feel the impact of the assistance and who have some perceptions and opinions on the assistance that they directly encountered.

The representatives from each stratum were selected in proportion to the respondents in the recipient population of the aid. This made it certain that the recipients of every organization were selected in proportion to their frequency in the population. Where, for example, Caritas Isiolo had more recipients than organizations, its recipients were represented proportionally in the sample in relation to the other organizations. Having defined the strata and the strata ratios, then simple random sampling was conducted where within each stratum individuals were sampled. This was either through the use of a random number generator or through random picking of names from an aid beneficiary list such that every individual who was eligible had an equal chance of being included in the sample. The sampling frame was the registered Muslim beneficiaries of the aid by all the Christian organizations serving in Isiolo County. The roll was constructed from the respective six organizations and verified for completeness and accuracy in an attempt to cover the beneficiaries' population. The verified total of 2,230 beneficiaries of the aid and estimated sample size of 340, the sample was distributed proportionally to the respective strata. Sample size per stratum was established as a percentage of the target population of the aid beneficiaries.

3.3 Data Collection

Questionnaires were the principal tools in data collection which was quantitative. Close-ended questionnaire was applied in the administration of questionnaires on the target audience of the target population. The questionnaire contained open and close-ended questions with a view of gathering diverse responses on the attitude and perception of the community towards Christian aid. The questionnaire touched on sensitive topics such as: General impressions of Christian aid, under what circumstances the aid was being provided, and probable effect of aid on Christian-Muslim relations. Questionnaires were handed out personally and this allowed the possibility of easy collection of data from masses, and generality and reliability for numbers were ensured.

3.4 Data Analysis and Presentation

Percentages, frequencies, and medians were computed for reporting demographic information summaries and on Christian aid community attitudes. Since the dependent variable (Christian–Muslim relations) was also recoded into two attributes, inferential statistics, i.e., binomial-logistic model of regression, were used to ascertain the effect of independent variables (mode of reception of aid i.e., gratitude, suspicion, or conditional acceptance) on dependent variable (Christian–Muslim relations). Results were calculated from frequency tables endeavoring to make them readable and comparable with ease.

3.5 Ethical Considerations

The information was provided fully and in non-technical terms as a means of facilitating the participants in making an informed decision to participate. There was care to seek permission of all the subjects to facilitate complete voluntary participation and that they were informed that they had a right to withdraw at any point without negative consequence. There was privacy at all levels of the research. Anonymity of participant and response was maintained in such a way that there was no means whatsoever to trace data back to individuals. The information was also kept securely and to the individuals only who needed to do so, hence safeguarding secret information. Confidentiality was also considered; the interview and questionnaire were conducted in private rooms to enable participants to be free and safe in providing their experiences.

The personal information acquired from the participants was respected, and they were not forced to provide matters that injured them. They also honored the participants' health by treating them well whenever they required it and being polite during transactions. Transparency and honesty were used in the reporting of study findings. Study findings were reported transparently as the ones obtained, and conflict of interest disclosed for the sake of preventing

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bias in the study. Second, the research proposal was prepared for review and approval before an institutional ethics review board for adherence to human-subject study ethical standards. Following such ethical standards, the research would conduct a study that would be respectful, responsible, and dedicated to the highest potential ethical standards.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistics

4.1.1 Grateful Acceptance of Christian Aid

The research was interested in finding out the influence that welcomes Christian aid with gratitude has on Christian-Muslim relations in Isiolo County. They were also asked to rank on a scale of 1 to 5, from "Strongly Disagree" to "Strongly Agree", how much they disagreed or agreed with a series of statements about how the community reacted in relation to Christian relief. The result, as presented in Table 1, shows attitude and community reaction towards Christian relief tendencies.

Table 1

Grateful acceptance of Christian Aid

Statement	1	2	3	4	5	Median
The community often expresses gratitude for the Christian aid provided	26%	30%	21%	13%	10%	2
Local leaders publicly endorse the aid provided by Christian organizations	32%	27%	24%	12%	5%	2
There is active community participation in initiatives associated with Christian aid	28%	28%	22%	15%	7%	2
The community is willing to engage in long-term projects with Christian aid providers	31%	26%	14%	18%	11%	2

Table 1, 56% shows that the respondents agreed (30%) or else strongly agreed (26%) that the community frequently appreciates Christian assistance. This is a normally taken to be a positive attitude towards Christian humanitarian assistance. The median value of 2 shows that the community leans towards agreement, and therefore, thankfulness is the frequent response pattern among Muslim recipients.

Also documented was strong public support for local leaders, where 59% strongly agreed (32%) or agreed (27%) that Christian aid programs are endorsed by public leaders. Public support is crucial because Muslim leadership acceptability will put legitimacy seal on engagement with external actors Alio (2015, p. 301). This agrees with Nyongesa (2019, p. 312), who testified that the public mobilization by local leaders enhances trust, program legitimacy, and religious group collaboration in faith-based development programs.

Moreover, 56% of the respondents affirmed positively involvement in Christian relief schemes, i.e., beneficiaries are not just passive recipients but also play an active role in the implementation process. This is at the heart of facilitating ownership and sustainability of the relief program. Ekezie (2022, p. 15) also found in Nigeria that participatory involvement in interfaith schemes has the ability to create mutual respect and sustainable engagement among people of different faiths.

57% of them agreed or strongly agreed when they were asked whether they would be willing to work in long-term collaborations with Christian relief agencies. The implication is extremely high trust and openness to further cooperation. Safapour et al. (2021, p. 15) got the same response on the study on the frequency with which natural disasters occurs in places of interfaith conflict, where gratitude by Christian relief agencies meant they were open to forming long-term alliances, hence promoting peaceful coexistence and respect among faiths. Overall, the study recognizes that appreciation is a good facilitator of good Christian–Muslim relations in Isiolo County. Appreciation, expression of appreciation, public appreciation, community involvement, and willingness for long-term collaboration in general portray positive Christian assistance attitude. Appreciation not only guarantees social cohesion but also forms the foundation of interfaith interaction and building confidence.

This is also consistent with Dickens (2017, p. 204), which predicts that appreciation of interreligious humanitarian activity lowers prejudice and boosts affective reciprocity. It is also consistent with Allport's (1954) Contact Hypothesis requiring friendly contact in the form of equality and respect lowers intergroup hostility. The Isiolo case therefore illustrates global broader tendencies whereby religiously identified aid organizations appreciation contributes to bridging religious divides and achieving peaceful coexistence (De Lauri & Turunen, 2022, p. 44).

In short, appreciative acceptance of Christian aid in Isiolo County favors Christian–Muslim relations positively by fostering gratitude, respect, and hope for further interaction. It can be argued that gratitude serves as a social and moral bridge, making interaction in aid exchanges into interfaith relationships of understanding and shared long-term devotion.

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4.1.2 Suspicion and Wariness towards Christian Aid

The questionnaire aimed to explore how suspicion and mistrust of Christian aid envelop Christian-Muslim relations in Isiolo County. Respondents provided scores from 1-5 for four statements regarding their behavior and attitude towards Christian aid and their willingness to accept them. How the results were phrased can be seen from Table 2.

Table 2

Suspicion and Wariness towards Christian Aid

Statement	1	2	3	4	5	Median
There is a concern in the community that accepting Christian aid might lead to religious conversion.	29%	31%	10%	20%	10%	2
Many people prefer to accept Christian aid privately rather than publicly.	37%	29%	15%	13%	6%	2
Negative rumors about the intentions behind Christian aid are common in the community.	15%	7%	20%	28%	30%	4
The community shows reduced participation in programs associated with Christian aid.	40%	29%	12%	15%	4%	2

The results in Table 2 show the widespread fear among Isiolo County Muslims regarding Christian aid intentions. A total of 60% of the respondents (31% agreed and 29% strongly agreed) were concerned that the acceptance of Christian aid would mean religious conversion. The median value of 2 shows that this fear does exist and is common. This is in accordance with, Gutkowski and Larkin (2021, p. 1069) whose findings established that over 65% of Syrian Muslim aid recipients were apprehensive that Christian humanitarian assistance might have proselytization motives. Similarly, Nur Syam and Ahida (2025, p. 52) revealed that almost half of the respondents in Aceh, Indonesia, were of the opinion that Christian aid might be a disguise for conversion work.

The findings also reveal that 66% of the respondents (37% strongly agreed and 29% agreed) would prefer receiving Christian aid privately as compared to publicly. This finding means a fear of stigma based on social understanding of receiving aid from a Christian agency. This type of privacy-driven prudence is consistent with Gutkowski and Larkin (2021, p. 1061), wherein rural Syrian Muslims would not openly identify themselves with Christian groups in order to escape communal reprisal or accusations of apostasy.

On the other hand, 43% of the respondents disagreed or strongly disagreed that it was pervasive, in addition to 35% agreed or strongly agreed. This polarized reaction (median 4) indicates polarization some in the community are highly distrustful of Christian motives for assistance, whereas others can maybe perceive them as innocuous. This aligns with (Weldu & Nyanchoga, 2024, P. 219), who identified similar divisions amongst Ethiopian Muslims, concluding that suspicion was consistent with prior exposure to Christian agencies and local religious leaders' attitudes.

The noteworthy 69% of interview respondents (40% strongly agreed, and 29% agreed) ensured that participation of the community in Christian relief programs is lower due to suspicion. That low rate of participation goes a long way to show how suspicion directly affects the effectiveness and provision of humanitarian interventions. The same findings were reported by Afolaranmi (2020, p. 249) in Nigeria, whereby over half of Muslim respondents associated Christian relief activity with the goal of conversion, leading to low program participation.

These results confirm the theoretical expectations of Social Identity Theory (Tajfel & Turner, 1986), which asserts that group identity influences perception and interrelation with out-groups. In this case, the religious "in-group" designation (Muslim) is likely to stimulate suspicion of the "out-group" (Christian organizations), especially in settings dominated by historical and theological competition. Intergroup Contact Theory is also applicable here: where there is no meaningful intergroup contact, suspicion and prejudice prevail. In Isiolo, limited interfaith interaction and asymmetrical power relations can prevent the constructive contact conditions for attaining mutual trust.

Therefore, wariness and distrust of Christian assistance in Isiolo County are socially entrenched as well as historically founded. These disaffection and skepticism depredate community involvement, undermine credibility, and complicate interfaith collaboration. But these outcomes also offer a chance: by confronting fears through transparent, non-proselytizing means and participatory local alliances, Christian NGOs have the potential to restore trust over time and foster healthier Christian–Muslim relations.

4.1.3 Conditional Acceptance of Christian Aid

The study deliberated on the impact of the conditional acceptance of Christian aid on Christian-Muslim relations in Isiolo County. The respondents had to score their level of agreement with four statements on the community's method of accepting Christian aid, from 1 (Strongly Agree) to 5 (Strongly Disagree). The findings, as seen in Table 3, highlight the calculated and cautious nature of the community's method of accepting foreign aid.

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Table 3

Conditional Acceptance of Christian Aid

Statement	1	2	3	4	5	Median
The community often sets specific conditions before accepting Christian aid.	35%	31%	12%	15%	7%	2
Only certain types of Christian aid are accepted by the community.	38%	30%	14%	12%	6%	2
There is negotiation between the community and aid providers to clarify the terms of the aid.	36%	31%	14%	12%	7%	2
The community monitors the use of Christian aid to ensure it meets the agreed-upon conditions.	40%	31%	11%	11%	7%	2

According to Table 3, one would be intrigued to find that an interesting percentage of respondents said that the community places conditions on receiving Christian aid. Exactly, 35% of the respondents completely agreed and 31% agreed that the community often places certain conditions before taking the aid. This means the community is not a mere recipient and rather shapes the conditions under which the aid is received so that it fits religious and cultural norms. Also, 38% of the people strongly agreed and 30% agreed that certain types of Christian aid are only acceptable. This selectivity indicates careful examination of the type of aid, with the community having a predisposition for those that are for immediate social and economic needs and avoiding those that would in any way compromise their religious or cultural unity. Negotiations also emerged as important, with 36% strongly agreeing and 31% agreeing that discussions with aid providers help clarify terms.

This proactive involvement highlights agency within the community, echoing Green (2020, p. 18) argument that African faith communities often "renegotiate the meaning and function of aid" to preserve local religious identity while engaging external support. Finally, 40% of the participants strongly agreed and 31% agreed that they monitor use of aid to maintain agreed terms. This level of alertness shows community determination to safeguard its values, a discovery in line with Ng'etich (2024, p. 4), who added that Muslim communities in East Africa approach Christian NGOs cautiously, often putting boundaries on projects to prevent perceived proselytization. This aligns with Weldu and Nyanchoga (2024, p. 222), who described in Ethiopia that conditional acceptance was a pragmatic approach: communities embraced humanitarian assistance but insisted on limiting Christian visibility to reduce tension. At the same time, some researchers caution that overregulation of assistance gets in the way of long-term partnerships. For instance, Kemp (2023, p. 315) argues that undue conditionality or suspicion will dissipate the power of transformation of interfaith alliances, fixing communities in transactional as opposed to trust-based relationships.

4.2 Inferential Studies

4.2.1 Parameter Estimates on the Implications of the Patterns on Christian and Muslim Relations

Table 4 presents a detailed description of the parameter estimates of the binomial logistic regression model, which shows the role played by various determinants on the likelihood of having good relationships between the Christian and Muslim worlds.

Table 4

Model Parameter Estimates

Model		B	df	Sig.	Exp(B)
1	Grateful acceptance	1.567	1	.002	4.792
	Suspicion and wariness	1.487	1	.011	4.424
	Conditional acceptance	1.381	1	.013	3. 979
	Constant	1.193	1	.010	3.297

Statistical modeling of Table 5 indicates the strongest positive predictor to be grateful acceptance (Exp(B) = 4.792, p = .002). That is, five times more acceptable are the possibilities for good interfaith relations due to gratitude by one unit. The finding was supplemented by qualitative interviews. A Muslim youth leader said, "When we thank them openly for the boreholes or schools, they also respect us more." It clears tension. Thankfulness, yet another of our interviewees proposed, also helped make it drawing reciprocal support from relief agencies and, by implication, sustaining cooperation. Appreciation of religious aid in African contexts makes Wilkinson and Tomalin (2023, p. 204) say it rejuvenates trust and creates avenues for interfaith collaboration. They further shows that expression of gratitude, even in a situation where there are convergently disparate relief relations, helps towards speaking and an avenue towards peace-building.

Suspicion was also a significant negative predictor (Exp(B) = 4.424, p = .011). The greater the suspicion of the respondents, the over four times higher opportunities existed for dissidence with cordial relationships between religions. Suspicion that the respondents witnessed on a day-to-day basis. For instance, one of the elderly respondents was quoted

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to have said, "Sometimes the help comes with hidden teachings. We fear if our children get affected.". They responded, "We take the food but are not actually certain what they really want from us." Such signs illustrate how distrust destroys cooperation. This is further corroborated by Ng'etich (2024, p. 4), who also factored in the aspect that Muslim communities do not trust Christian relief to be a tool of proselytism. Conditioned acceptance was also significant (Exp(B) = 3.979, p = .013). This verifies conditionality is not rejectionist behavior but one that even builds relationships as long as Muslim sensitivities are not offended. One of the originators of such a women's group described it as, "We say we're taking food, but no preaching." When they negotiate first with our leaders, then we get the aid in total. Another of the respondents responded, "When they agree, things are better." Green (2020, p. 22) describe how conditionality in negotiated aid agreements makes people independent and enables greater inter-faith engagement. Also, Morse et al. (2023, p. 12) concludes that conditionality brings greater dignity, agency, and respect to more dominant recipient groups through more religion-based relationships for assistance.

The persistence (B = 1.193, p = .010; Exp(B) = 3.297) indicates that there are other determinants that influence Christian-Muslim relations. Evidence gathered using interviews attributed political bias, economic inequality, and interlocal leadership rivalries as determinants that influenced. One of the interviewees detailed as, 'Sometimes the problem isn't aid, but politics politicians use it to divide us.' Kemp (2023, p. 317) agree as well by asserting that socio-political motivations hold equal potential to generate interfaith experience as do religious motivations.

Lastly, regression and qualitative findings are congruent to presume that: Appreciation fosters cooperation and good will. Suspicion demolishes trust and engenders tension. Conditional acceptance is the realistic middle path that promises respect and dignity. Triangulated awareness here also tells us that aid will fill or create gaps based on reception and management. In seizing control of the relations between Christians and Muslims, aid agencies must create openness, accept realities on grassroots level, and assure each side's appreciation.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

Grateful Acceptance as a Driver of Positive Relations: Both quantitative and qualitative findings confirmed that acts of appreciation, public expression by leaders, and people's participation in aid programs instilled goodwill and fostered a culture of cooperation. Logistic regression analysis confirmed that appreciation is the strongest predictor of harmonious Christian-Muslim relations with the odds being nearly five times higher for consensus than cooperation. It means wherever recipients of such assistance as the worth of outside help volunteer to take it, it brings respect, sympathy, and cooperation.

Suspicion and Wariness as a Barrier to Cooperation: Surprisingly, it also discovers that suspicion and cautiousness are indeed actual barriers to Christian-Muslim cooperation. Distrust of ulterior motives or doubt of concealment dissuades individuals from believing and engaging in the relief effort. Logistic regression discovered that doubt of four times or more doubled the chances of strained interfaith relations. Qualitative data attested to this in the sense that informants had already encountered such cases in the past when aid was conflated with missionary work and thus causing the prevalence of paranoia. Its conclusion is that suspicion would only be confronted with openly defined communication, consulting a village chief, and open types of aid, or else even apparently good Intervention will fuel suspicion and enhance intrafaith conflict.

Conditional Acceptance as Enabling Pragmatic Middle Ground: It also suggests that conditional acceptance is empowering pragmatic middle ground to Christian aid's problem. By conditionally laying down conditions such as lexical exclusion of religious sermons, requiring culturally appropriate aid, and requiring negotiated settlement, the community is not in a state of chaos but is still in control and maintains its identity and gains external assistance at the same time. Regression analysis indicated conditional acceptance doubled inter-faith cooperation and doubled potential for cooperation given conditions were met. KIIs revealed leaders and elders would sooner negotiate aid terms and coordinate aid provision, an instance of active agency on the part of the community. The implication thus is that conditional acceptance, as much as it angers aid at times, is a viable middle path between suspicion and appreciation balancing receptivity to aid and religious and cultural justice.

Finally, the study concludes Christian relief in Isiolo County is conditionally meaningful, relational, and situated and not always positive but not always negative. Gratitude restores good will and tightens relations; mistrust ruins trust and destroys interaction; and acceptance on terms is a reasonable compromise that enhances respect and negotiation. The stability in the regression model also found other determinants such as politics, leadership relations, and socio-economic inequality also exhibit effects on interfaith outcomes further evidence Christian-Muslim relations to be multi-dimensioned and complex.

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5.2 Recommendations

Enhance transparency and communication: As a measure towards enhancing effective dispensation of fear in the context of Christian interest in relief and removal of suspicion, the aid agencies must enhance transparency of operation. Open and truthful declaration of purpose and intention behind aid programmes will enhance trust and dispel fear of religious conversion. Credible information about the intention of the aid and persuading people of their efficiency is one which they can accept will give rise to harmony and acceptance. Encourage dialogue and inclusivity: Encouragement of dialogue between Muslim and Christian nations has a critical role in bridging knowledge gaps as well as encouraging trust. Encouragement of bilateral dialogue as well as collective action will automatically encourage inter-faith collaboration. These two cultures are capable of achieving understanding and better relations through cooperation in common goals and issues.

Be respectful both culturally and religiously in developing aid programs and dispensing aid: Avoid pushing conditions and terms and let aid be accepted within paradigms of their belief and values will bear acceptance and easy distribution. Sensitivity towards them will prevent conflict and enable assistance to be provided in a dignified and effective manner.

Monitor and Evaluate Aid Programs: Aid programs should be monitored and evaluated periodically so that aid programs are delivering according to expectations and needs of the population. Involvement of the community during the analysis of programs can give useful feedback and empower the programs to be rendered more indigenous-value-relevant. Sustained checking on the effectiveness and merit of the aid can stimulate field success areas and overall aid process enhancement.

Encourage long-term relationships: Building long-term relationships with the community is likely to produce long-term outcomes. Aid agencies must invest money in creating long-term relationships and hear out the voices of community leaders and collaborate with them in dealing with long-term challenges and opportunities. With increased long-term involvement and discussion, development initiatives can be in a position to make longer term and more sustainable effects.

Conflict of Interest

The authors declare that they have no conflict of interest related to this study.

REFERENCES

Afolaranmi, A. O. (2020). Faith-based interventions in the reintegration of migrated displaced persons into the society. *African Journal of Political Science, 9*(2), 34–36.

Ager, W., French, M., Fitzgibbon, A., & Ager, A. (2019). The case for—and challenges of—faith-sensitive psychosocial programming. *Intervention, 17*(1), 69–75.

Alio, M. S. (2015). Kenyan Christian-Muslim relations: Bridging factors and persisting challenges. *International Journal of Education and Research, 3*(12), 298–304.

De Lauri, A., & Turunen, S. (2022). Forms of humanitarian diplomacy. *Project Repository Journal*.

Dickens, L. R. (2017). Using gratitude to promote positive change: A series of meta-analyses investigating the effectiveness of gratitude interventions. *Basic and Applied Social Psychology, 39*(4), 193–208.

Ekezie, W. (2022). Resilience actions of internally displaced persons (IDPs) living in camp-like settings: A Northern Nigeria case study. *Journal of Migration and Health, 6*, 100115.

Elayah, M., & Al-Awami, H. (2024). Exploring the preference for bilateral aid: Gulf oil states' aid to Yemen. *Third World Quarterly, 45*(2), 2266–2286.

Green, J. (2020). Faith-based organisations in Sub-Saharan Africa: Negatives, positives, and recommendations for effective promotion of human rights. *International Human Rights Internship Program Working Paper Series, 8*(1), 56–59.

Gutkowski, S., & Larkin, C. (2021). Spiritual ambiguity in interfaith humanitarianism: Local faith communities, Syrian refugees, and Muslim–Christian encounters in Lebanon and Jordan. *Migration Studies, 9*(3), 1054–1074.

Kemp, S. (2023). Effective faith partnerships during COVID-19: Lessons learned from development practitioners. *Religion and Development, 2*(2), 309–320.

Kenya National Bureau of Statistics. (2019). *2019 Kenya population and housing census: Volume I–IV*. Kenya National Bureau of Statistics.

Khafagy, R. A. (2020). Faith-based organizations: Humanitarian mission or religious missionary? *Journal of Humanitarian Action, 5*, Article 13.

Kipgen, N. (2020). Myanmar's perspective on the Rohingya crisis. *International Journal on World Peace, 37*(1), 43–70.

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Morse, S., McNamara, N., Nathan, N., Adamu, S., Micah, O. I., Kabir, M., Onwuaroh, A. S., & Otene, N. (2023). The leveraging of support by faith-based social groups in rural villages of the Federal Capital Territory, Nigeria. *Sustainability, 15*(19), 14251.

Ng'etich, E. K. (2024). Religion and development in Africa: History, status, and future prospects. *Religion Compass, 18*, e12511.

Nur Syam, & Ahida, R. (2025). Religious harmony in Singkil, Aceh, Indonesia: New paradigms for rebuild religious understanding. *International Journal of Islamicate Social Studies, 3*(1), 44–64.

Nyongesa, P. M. (2019). Analysis of inter-faith dialogue between Christians and Muslims as a response to religious radicalization in Kenya. *International Journal of Social Science and Humanities Research, 7*(3), 305–314.

Safapour, E., Kermanshachi, S., & Pamidimukkala, A. (2021). Post disaster recovery in urban and rural communities: Challenges and strategies. *International Journal of Disaster Risk Reduction, 64*, 102535.

Ssetuba, S. (2024). Examining the roles of faith-based organisations in HIV/AIDS prevention, care and support in Uganda. *IDOSR Journal of Applied Sciences, 9*(2), 83–91.

Tajfel, H., & Turner, J. C. (1986). The social identity theory of intergroup behavior. In S. Worchel & W. Austin (Eds.), *Psychology of intergroup relations* (pp. 7–24). Nelson-Hall.

Weldu, A. H., & Nyanchoga, S. (2024). Exploring Christian-Muslim dialogue for sustainable peace and development in the Oromia Region, Ethiopia: Social transformation perspective. *Journal of African Interdisciplinary Studies, 8*(5), 212–230.

Wilkinson, O., & Tomalin, E. (2023). Secular-religious dynamics and their effect on humanitarian norms compliance. *Journal of Human Rights Practice, 5*(6), 37.

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Re-securitizing the borderlands of Kenya and Somalia to counter the operational influence of terrorist groups in the Horn of Africa region

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ABSTRACT

Terrorism in the twenty-first century continues to reshape state security systems, particularly in the Horn of Africa, where weak governance structures and porous borders create enabling environments for extremist groups. This paper examines the counter-terrorism strategies employed by the Republic of Kenya and the Federal Government of Somalia in mitigating the operational influence of terrorist organizations that not only conduct kinetic attacks but also seek to fill governance vacuums in marginalized border regions. Guided by neorealism and securitization theory, the study interrogates how state-centric power calculations and security discourses shape bilateral cooperation in confronting an asymmetric, transnational threat. The research engaged 313 respondents from Mandera (Kenya) and Bulahawo (Somalia) using an explanatory sequential mixed-methods design, supplemented with documentary and archival evidence. The findings show that institutional mistrust, overlapping jurisdictions, and persistent socio-economic marginalization curtail the impact of bilateral counter-terrorism efforts, despite their moderate operational effectiveness. These structural weaknesses enable militant groups to occupy governance gaps by providing rudimentary security, justice, and welfare functions in areas where the state presence remains limited. The study concludes that sustainable counter-terrorism in the Horn of Africa requires a paradigm shift away from heavily militarized approaches toward human-security-oriented models that integrate community resilience, coordinated cross-border intelligence, and development-focused diplomacy. Achieving long-term stability therefore depends on transforming Kenya-Somalia cooperation from a predominantly military undertaking into a security-development compact capable of restoring state legitimacy in borderland regions.

Keywords: Bilateral Cooperation, Counter-Terrorism, Horn of Africa, Kenya-Somalia Relations, Neorealism, Securitization

I. INTRODUCTION

Terrorism is among the most dynamic and challenging threats to global peace, human security, and the stability of states in the twenty-first century. The level and complexity of terrorist activities have been growing over the past years, which forces states and multilateral institutions to implement multi-dimensional counter-terrorism (CT) strategies, including military responses and intelligence-sharing strategies, as well as cyber defence, community policing, and socio-economic resilience measures (United Nations Office of Counter-Terrorism [UNOCT], 2023). Modern studies indicate that kinetic efforts can no longer be used to eradicate terrorism based on its sustainability, but rather, structural causes are closely related to political weaknesses, socio-economic marginalization, and elite corruption, and gaps in governance within which extremist groups take advantage to embed themselves to survive within the weak societies (Botha, 2019).

These structural shortcomings have made the continent one of the worst hit in the war against terrorism around the globe as witnessed in the Global South, and Africa, in particular. The recent news indicated that over fifty percent of all terrorism-related killings in the world happen in Sub-Saharan Africa, fuelled by growing violence in the Sahel and the Horn of Africa (Institute for Economics & Peace, 2024). Somalia has been one of the most dangerous battlefields across the globe, and armed groups like Al-Shabaab still threaten the power of the state by launching attacks on specific targets, including cross-border operations, and recruitment of new members based on ideology (Hassan, 2022). To counter this, the regional and international bodies, such as the African Union Transition Mission in Somalia (ATMIS), have focused on stabilization interventions, security sector transformation, and avenues of intelligence sharing that would effectively reduce the functioning capacity of these groups (African Union, 2024).

Kenya is in an unfortunate situation because it has a very large and porous border with Somalia. Immediately after the Kenya Defence Forces (KDF) achieved success in tactically planning the operation Linda Nchi in 2011 and thereafter integrated into AMISOM/ATMIS, Al-Shabaab still possesses the capability of asymmetric attacks along the borderlands. The U.S. Department of State indicates that Kenya has been experiencing a tangible rise in the frequency

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and territorial dispersion of terrorist attacks between 2021 and 2023, which proves the persistence of insurgent cells and their capacity to capitalize on the inefficiencies and loopholes in governance and socio-economic frameworks in frontier counties, like Mandera, Wajir, and Garissa (U.S. Department of State, 2023). The counter-terrorism architecture of Kenya is based on a combination of military activities, intelligence-driven policing, and CVE initiatives on the community level and is anchored by the Prevention of Terrorism Act (2012) and the National Strategy to Counter Violent Extremism (Republic of Kenya, 2022).

Nevertheless, Horn of Africa terrorism is transnational by its very nature and therefore, state actions in a unilateral manner are inadequate. This explains the strategic value of Kenya-Somalia bilateral security cooperation, including joint border operations, coordinated intelligence sharing, diplomatic interaction, and legal harmonization. Although there is continuous cooperation, there are doubts about the effectiveness, legitimacy, and sustainability of these cooperative mechanisms. Ongoing attacks and the development of insurgent tactics suggest that bilateral efforts are still undermined by the premise of embedded institutional and governance limitations (Bryden, 2023).

Moreover, the two nations have domestic issues that weaken the effectiveness of counter-terrorism efforts. Weaknesses in the governance of states in Somalia, combined with historic marginalization in the border counties of Kenya, have created governance gaps where non-state armed groups have assumed quasi-governance roles, providing informal justice and rudimentary welfare services in areas where state presence is low (Lind, 2022). Such dynamics erase the lines between insurgency, governance, and legitimacy, making standard CT tactics difficult and supporting extremist discourses. There are other limitations, such as a lack of sufficient funding, poor cyber-intelligence, and low community trust, which also make the CT operations less sustainable (International Crisis Group, 2023).

In this regard, the Horn of Africa is not merely a geographic boundary but also a policy and analytical boundary in the manner in which states come to define and practice counter-terrorism in bilateral terms. The current literature on the area is sporadic, where the majority of the works focus on Kenya and Somalia without considering them as mutually supportive security players. This generates an important empirical and theoretical gap, especially because terrorist organizations are run fluidly across borders, and they take advantage of lapses in bilateral collaboration.

To fill this gap, this study aims to determine the effectiveness of Kenya-Somalia bilateral counter-terrorism strategies to minimize the operating capacity and operations of terrorist groups in the Horn of Africa. Based on the Securitization Theory and the Neorealism school, the paper will discuss the strategic incentives that the bilateral cooperation is based on, as well as the actual results of such CT agreements.

1.1 Research Objective

The study aimed to evaluate the effectiveness of bilateral counter-terrorism strategies between Kenya and Somalia in combating the operational influence of terrorism in the Horn of Africa.

II. LITERATURE REVIEW

2.1 Theoretical Review

This paper uses a dual theoretical perspective of the approach based on the Securitization Theory and Neorealism to describe how Kenya and Somalia construct, operationalize, and assess their counter-terrorism policy in the Horn of Africa.

2.1.1 Securitization Theory

Securitization Theory, developed by the Copenhagen School of Security studies, holds that security threats are not self-evident but are constructed socially by discourse and political practice. The concept was first presented by Ole Waever in the 1990s, which highlighted that a problem becomes a security matter once it is perceived as an existential threat by powerful actors like political leaders or state institutions (Waever, 1995). This model was subsequently codified by Buzan et al. (1998), who defined securitization as a process that allowed governments to rationalize extraordinary action like the deployment of military forces, emergency laws, or enhanced surveillance over and above the usual political practices.

The speech act is the core of the theory: a performative statement, according to which a phenomenon (e.g., terrorism) is an existential threat, and as a result, it stimulates the masses and the institutional intervention (McGlinchey, 2021). With such a formulation, securitization is not only descriptive but constitutive; with a naming of a threat, political actors create a sense of what society may think and what is important in the policies of the people. Nevertheless, securitization can be made successful only in case the concerned audience, such as citizens, legislators, or bureaucratic institutions, recognizes the claim and validates the suggested extraordinary responses (Waever, 2015).

In spite of its analytical virtues, the Securitization Theory has been criticized based on its unintentional political impacts. Other researchers believe that securitization may fuel nationalist feeling and suspicions of us against them (Dewdney, 2018). Others warn that securitized discourse can lead to militarized responses in building policy that

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dwarfs diplomatic or developmental policies (Lieven, 2020). Other criticisms draw attention to the danger of the commercialization of security, in which case, the policy-making process is affected by private defense and surveillance sectors to increase the market opportunities (Hayes et al., 2020).

Using this theoretical prism on Kenya-Somalia counter-terrorism cooperation, securitization can be used to understand how both states have framed terrorism as a life-threatening existential challenge that must be addressed with extraordinary measures. The 2011 Operation Linda Nchi by Kenya and the ongoing cooperation of Somalia with ATMIS can be viewed as securitizing actions that are explained by appeals to national survival and the territorial integrity. The theory also sheds some light as to how the intelligence sharing across borders, the increase of police authority, and the militarization of border control are packaged as required in the larger counter-terrorist context.

Nevertheless, this paper claims that securitization will not be enough to generate a sustainable counter-terrorism achievement. Trusting in emergency-based, militarized responses too much will jeopardize emphasis on longer-term structural ways to solve problems. The Horn of Africa needs to be counter-terrorized by de-securitizing neighboring spheres using an inclusive approach to politics, socio-economic investment, and functional community involvement, especially in marginalized border zones where state legitimacy is fragile.

2.1.2 Neorealism (Structural Realism)

Neorealism, developed by Kenneth Waltz in Theory of International Politics (1979), redefines classical realism by indicating a different explanatory emphasis on human nature, which is replaced by the structural properties of the international system. According to Waltz, the global system is characterized by anarchy, or lack of central authority that can keep the actions of states within check, forcing them to use self-help strategies to protect themselves (Waltz, 1979). In this kind of environment, states seek alliances, counter-alliances, and other balancing mechanisms to safeguard their national interests and maintain their autonomy (Donnelly, 2019).

In this context, the state action will be driven by security and not moral or ideological commitments. Interstate cooperation is usually short term, tactical, and driven by threat, and its emergence is only occasioned when states realize that they are facing a common threat instead of sharing values (Mearsheimer, 2014). In this regard, Kenya-Somalia counter-terrorism relationship easily fits into the neorealist logic: the two states are facing a common menace in the shape of Al-Shabaab and hence have strategic reasons to cooperate by coordinating military action, exchanging information, and managing the border together.

However, neorealism also brings home the weaknesses within such security alliances. The existence of asymmetries in military capabilities, national interests, and ingrained mistrust may result in security dilemmas, as initiatives by one state to increase its security are seen as a threat by the other (Booth et al., 2020). These strains have been manifested in Kenya-Somalia relations with periodical diplomatic quarrels, interference accusations and cases of duplicated or uncoordinated border activities.

Despite the fact that critics regard neorealism as simplistic in its approach to international politics, by undermining the importance of domestic causes (identities, ideologies, and governance) in the international system, it still finds a useful application in the study of state behaviors in conditions of structural constraints (Barkin, 2010). In the Horn of Africa, neorealism assists in understanding why Kenya and Somalia emphasize militarized and state-centered policies of counter-terrorism and why their collaborative strategies are geared more towards regime security than human security. Unless there is parallel investment in institutional reform, inclusive government and socio-economic development of marginalized border areas, neorealist policies will be reproducing the insecurities they are meant to address.

Combined, the Neorealism and the Securitization Theory suggests a complementary approach to interpreting the Kenya-Somalia counter-terrorist relationships. Whereas neorealism is used to explain the formation of strategic alliances between states in an anarchic situation, securitization theory is used to explain how leaders are characterized discursively to mobilize popular opinion and justify extraordinary security precautions. Their overlap shows a major paradox to the Horn of Africa: the re-securitization of borderlands as a survival mechanism, at the same time, introduces governance vacuums and undermines state legitimacy. The analysis of variables in the present study is therefore based on this combined theoretical framework.

2.2 Empirical Review

A considerable number of empirical studies has been done on the effectiveness of counter-terrorism (CT) measures in various territories, which provides a benefit to the security cooperation between Kenya and Somalia. Through these studies, it is now clear when a CT measure would be fruitful or not particularly in cases where terrorist organizations are taking advantage of fragile governance and porous borders.

Montasari (2024) examined the United Kingdom CONTEST framework which is based on the four pillars of Prevent, Pursue, Protect, and Prepare. The researchers concluded that despite the fact that operation efficiency may be enhanced; there are still unresolved issues of over-securitization and the role of over-securitization when it comes to civil liberties. Montasari pointed out that a successful CT strategy is one that balances between hard security and

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community access, social solidarity and the protection of human rights. The results are very applicable to Kenya and Somalia, where excessive militarization of CT response has sometimes led to poor relationship between the security forces and border communities, which reduces long-term preventive efficacy.

Localized intelligence networks are becoming a significant focus in studies in the Kenyan context. The study by Lind (2022) focused on the security practices in Kenya on the border counties in the north, such as Garissa, Wajir, and Mandera. The study revealed that community policing, local peace committees and informal intelligence mechanisms are important in cross border infiltration prevention by the Al-Shabaab. Lind made a conclusion that transparency between the state agencies and the local populations is an important means of improving CT. These findings highlight Kenya-Somalia bilateral policies to incorporate community-based initiatives and formal security interventions.

Botha (2021) conducted a wider analysis of Kenyan CT strategies and assessed how the policy of security in Kenya has developed after such significant attacks like Westgate in 2013 and Garissa University incidences in the years 2013 and 2015 respectively. Botha also discovered that Kenya has enhanced laws, interagency efforts, and military action in Somalia, the security apparatus has not succeeded in ending the gaps in intelligence, human rights violations, and lack of collaboration with marginalized groups. These shortcomings are hampering long-term resilience and, perhaps, contribute to radicalization unwittingly, which is a crucial factor to be taken into account by bilateral CT initiatives in cooperation with Somalia.

Hassan (2022) investigated the impact of hybrid governance systems in Somalia on the work of CT in relation to the involvement of clan elders, local militias, and state forces. The paper has shown that the localized forms of governance supported, as opposed to bypassed, improve intelligence circulation and diminish the effects of Al-Shabaab in the rural regions. This implies that Kenya-Somalia collaboration should be in line with the local political realities other than basing on centralized CT models.

Regional studies support the worthiness of integrated CT approaches beyond East Africa. As Onuoha (2020) investigated the multisectoral CT undertakings of Nigeria against the Boko Haram, the military advantages were inconsistent without an equivalent investment in socioeconomic growth, deradicalization and inter-border coordination with the neighbouring states. In the same manner, Agbiboa (2023) suggested that community trust, localized prevention and international cooperation are the most effective ways of counter-terrorism effort in West Africa when balanced.

Collectively, these works indicate that there are consistent themes that can be applied to Kenya-Somalia CT relations: attention to military reactions is not enough; the success of intelligence is conditional on the reliability of trust to the local people; disruptions in coordination prevent the successful work of the state; and the success of CT is impossible without eliminating the root causes of deficits in socio-economic and governance.

Although this is increasing empirical literature, there are some gaps. There are limited literature reviews that offer systematic reviews of bilateral CT frameworks in the Horn of Africa region. There is little empirical evaluation of Kenya-Somalia combined operations, cross-border intelligence-sharing efficiency, and long-term effects of the terroristic operation. Additionally, available literature rarely quantifies the impact of bilateral strategies in its operational functioning or the degree to which such strategies lower the level of resilience and adaptability of groups like Al-Shabaab.

The paper aims to bridge these gaps by assessing whether Kenya-Somalia bilateral counter-terrorism mechanisms are working to minimize the capacity of the terrorist groups in Horn of Africa. The study is based on the experience gained over the course of previous studies, analyzing the implementation of bilateral CT strategies, the issues that they face, and the prospects that can be used to enhance the cooperation of the security in the region.

Despite the significant empirical evidence on counter-terrorism (CT) in East Africa and other conflict-prone areas, there are still some gaps in the literature that are critical in terms of bilateral collaboration between Kenya and Somalia. To begin with, the current literature mainly concentrates on the national-level CT strategies in any of Kenya or Somalia alone, as well as the examination of the local intelligence systems, security sector reforms, and community involvement. Nevertheless, there is little academic literature to analyse Kenya-Somalia CT cooperation as an interdependent system, although the operations of the Al-Shabaab transnational entity and the permeability of the borderlands make it fluid. This leaves the small amount of knowledge about the implementation of bilateral strategies to work and the impact that these strategies have had on operational results across the border.

Second, there is little to no empirical evidence on the effectiveness of joint counter-terrorism mechanisms, i.e. intelligence sharing, coordinated patrols, or common legal frameworks. Majority of the studies report the CT intervention, but fail to quantify and/or qualitatively assess the meaningfulness of the intervention to the control of the terrorism activity, to the disruption of operational networks, or to have enhanced the early-warning systems. Therefore, in the literature, there is no systematic evidence regarding the aspects of bilateral cooperation that works, in what conditions, and why. Third, minimal researches have been conducted on the challenges facing Kenya-Somalia CT initiatives in implementation. Many authors draw attention to such issues as mistrust, capacity gaps, fragile governance, and fragmented security institutions, but not many studies focus on the way these structural constraints

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weaken bilateral coordination. These challenges should be comprehended to come up with realistic and sustainable CT frameworks in the Horn of Africa.

Fourth, the current literature does not refer to community-level insights in bilateral CT measures frequently. Studies indicate that community trust, local intelligence, and socio-economic inclusion are the key to the success of CT, but the cross-border experiences of communities living along the border, especially in Mandera, Garissa, Gedo and Lower Juba, are not explored. This restricts information about the way bilateral CT policies may collaborate with local actors, informal governance, and socio-economic facts in marginalized frontier areas. Lastly, the literature on the topic of bilateral counter-terrorism efforts to long-term resilience is severely lacking. Recent literature concentrates on the short-term military rewards and occasional security operations and not much is done to check whether joint operations are tackling the root causes of radicalization like economic deprivation, political marginalization, and historical resentments. Lack of longitudinal and resilience based studies curtail the potential of the region to assess sustainability and reformulate policies to that effect.

Considering these gaps, the proposed study aims at offering evidence-based evaluation of the efficiency of Kenya-Somalia bilateral counter-terrorism policies, including the operational influence, the implementation issues, and the opportunities to enhance cross-border security collaboration. The research can address such under-researched aspects, thereby helping to fill one of the larger empirical and theoretical gaps in the wider body of counter-terrorism literature on the Horn of Africa.

III. METHODOLOGY

3.1 Research Design

The research design was a mixed-method research design, which incorporated both quantitative and qualitative methods to enable the researcher have a holistic view on Kenya-Somalia bilateral counter-terrorist strategies. The quantitative component allowed the measurement of the community experiences, perceptions, and patterns using structured questions using questionnaires, and the qualitative one allowed exploring the matter in more detail with the help of experts and officials as part of the Key Informant Interviews (KIIs). Such a design was suitable as counter-terrorism is a complicated socio-political and security concern that needs quantifiable only indicators and multi-layered narrative accounts.

3.2 Study Area

The study was carried out in one County (Mandera) of Kenya and Bulohawo (Beled Hawo) of Somalia- two adjacent border towns that have experienced a lot of terrorist and counter-terrorist activity within the Horn of Africa. The region was chosen on the basis that it indicates the pragmatic realities of bilateral security collaborations such as joint patrols, sharing of intelligence, and stabilization efforts under the African Union Transition Mission in Somalia (ATMIS). The dynamics render the region a perfect place to gauge the efficiency of Kenya-Somalia counter-terrorism policies, including socio-economic and institutional parameters of their application.

3.3 Target Population

The population of interest was household heads, terrorism victims, security personnel, as well as diplomats or government officials who were directly involved or affected by the counter-terrorism efforts at the Kenya-Somalia border. The reason behind the selection of these groups is that these groups have related knowledge, experiences, and views, which are crucial to assess the essence and results of bilateral counter-terrorism approaches.

3.4 Sampling Procedures and Sample Size

The researchers adopted both stratified and purposive sampling to ensure representativeness and professional input into the study. The stratified random sampling method was used on the household heads and victims of terror to be able to capture the various demographic and socio-economic factors in the two regions of study. A purposive sampling was intended to be used to sample security experts, diplomats, and government officials who have specialized knowledge when it comes to counter-terrorism operations.

The 384 respondents in the sample were calculated with the help of the Krejcie and Morgan (1970) sampling model. Purposive selection of 18 Key Informants was done to conduct in-depth interviews. Table 1 represents the sampling distribution.

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Table 1

Sampling Distribution by Category and Study Location

Category	Sampling Technique	Mandera (Kenya)	Bulohawo (Somalia)	Total Sample
Household Heads	Stratified Random	138	92	230
Affected Victims	Stratified Random	23	15	38
Security Experts	Purposive	34	22	56
Diplomats & Officials	Purposive	35	25	60
Total Respondents		**230**	**154**	**384**
Key Informants (KIIs)	Purposive	10	8	18

3.5 Data Collection Instruments and Procedures

Quantitative information in the form of structured questionnaires and qualitative insights in the form of Key Informant Interview (KII) guides were used to collect the data. The questionnaires were used to obtain demographic data, opinions about counter-terrorism efforts as well as the efficiency of bilateral security cooperation. The expert opinions were gathered by conducting KIIs with the representatives of the security forces, diplomats, community leaders, and government representatives. The fieldwork was carried out in in-person administration, as well as in guided interviews, where the confidentiality and the safety of the respondents were observed in the sensitive security environment.

3.6 Data Analysis

Coding and analysis of quantitative data were performed with the help of SPSS Version 26, and the descriptive statistics (frequencies, percentages, means) and the inferential statistics (testing of hypotheses) were utilized. KIIs as qualitative data were transcribed, organized, and analyzed on a thematic level to determine how trends are repeated, new insights arise, and contextual explanations. The combination of data of the two kinds reinforced the interpretation and increased the validity of the results.

3.7 Ethical Considerations

The study was approved by the Kenya Methodist University and the National Commission on Science, Technology, and Innovation (NACOSTI) on ethical grounds. The participants were told the purpose of the research, their anonymity ensured, and they were free to drop out any time without repercussions. Since security-related research is sensitive, other measures like anonymization of locations and identities were implemented to protect the respondents and make sure that ethical standards of research were met.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Findings on Effectiveness of Bilateral Counter-Terrorism Strategies

This paper aimed to measure the success of bilateral counter-terrorism (CT) measures between Kenya and Somalia in lowering the operational impact of terrorist groups. The respondents were requested to evaluate different facets of effectiveness, such as minimization of terrorist attacks, border personnel training, international cooperation, reintegration and de-radicalization programs, economic empowerment efforts, intelligence-led policing, and responsiveness of the CT strategies on the whole. This was done on a 5-poin Likert scale where: 1=not effective; 2=slightly effective; 3=moderately effective; 4=effective and 5=very effective. Table 2 includes the results.

Table 2

Respondents' Views on the Effectiveness of Bilateral Counter-Terrorism Strategies

Parameter	1 (%)	2 (%)	3 (%)	4 (%)	5 (%)	S.D	Mode	Mean	Rank
Reduction of terrorist attacks due to current CT strategies	2.88	5.77	34.62	47.76	8.97	0.85	4	3.54	2
Border security personnel training in CT protocols	2.24	11.86	58.65	20.83	6.41	0.8	3	3.17	6
International collaboration (e.g., with UN, ATMIS, IGAD) in CT operations	1.92	3.85	42.95	44.55	6.73	0.76	4	3.5	3
Reintegration programs for former extremists	2.88	10.58	57.37	24.36	4.81	0.79	3	3.18	5
Deradicalization initiatives aimed at preventing re-offending	2.24	9.62	49.36	34.29	4.49	0.79	3	3.29	4
Economic empowerment programs reducing susceptibility to radicalization	2.88	5.45	30.13	51.92	9.62	0.85	4	3.6	1
Intelligence-led policing in your area	4.81	21.15	43.59	24.36	6.09	0.94	3	3.06	7
Current CT strategies address the main threats in your area	3.53	17.95	50.96	22.76	4.81	0.86	3	3.07	8

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The results show that the respondents usually evaluated the effectiveness of bilateral CT strategies as moderate to quite high. The overall proportion of 56.7% of the respondents (Effective + Very Effective) who said that current measures have helped reduce the number of terrorist attacks gave a mean of 3.54 (SD = 0.85). This indicates that combined efforts between Kenya and Somalia have provided tangible albeit lopsided security gains. The initiatives of economic empowerment gained the greatest average score (M = 3.60, SD = 0.85), and 61.5% of the respondents gave the initiatives a rating of effective or very effective. This highlights the perceived importance of the socio-economic line of attack on the root cause of radicalization, including unemployment and marginalization. The international collaboration, especially frameworks that included UN, ATMIS, and IGAD, was also evaluated highly (M = 3.50, SD = 0.76), and 51.3% indicated that it positively impacted the stability of the region and coordination of intelligence. In the same way, the de-radicalization efforts (M = 3.29) and the rehabilitation of former extremists (M = 3.18) were considered to be moderately effective. These responses lead to the cautious optimism of the respondents, which means that although there are mechanisms of rehabilitation, their sustainability and reach are limited in the long run.

In comparison, intelligence-led policing and training of border security employees turned out to be the least effective dimensions. The border security officers scored a mean of 3.17 (SD = 0.80) with majority of the respondents (58.65) indicating that it was only moderately effective. This means that although it has training programs, it might not be regular, comprehensive, and standardized enough to deal with the changing threats. Similarly, the mean of intelligence-led policing was the lowest (M = 3.06, SD = 0.94), indicating that there are still coordination gaps, technological lag or absence, and low levels of integration between the Kenyan and Somali security agencies.

Lastly, the respondents were questioned about whether the existing CT strategies are sufficient to deal with the primary threats in their domains, and 50.96% were neutral, with only 27.6% acquiescing to this question. The respective mean of 3.07 (SD = 0.86) is a pointer of doubt as to the effectiveness of currently implemented measures. In general, the results of the description indicate that the most effective elements of Kenya-Somalia bilateral counter-terrorism activities are seen in international cooperation, economic empowerment, and minimization of terrorist attacks. On the other hand, border staff training, intelligence-based policing, and reintegration initiatives need to be strengthened to increase the operational effectiveness and police credibility. These findings contribute to the new-found agreement on the significance of sustainable counter-terrorist outcomes, which are not founded on the basis of military collaboration only, but on comprehensive, developmental, and intelligence-driven approaches.

4.1.1 Qualitative Findings on Effectiveness

The quantitative data were supported by the qualitative data and provided more specific information on what the respondents thought about the effectiveness and performance of bilateral counter-terrorism (CT) strategies between Kenya and Somalia. The interviews demonstrated that there were 4 key themes such as the reduction of the influence of terrorists, the most effective features, the existing gaps, and monitoring and evaluation mechanisms.

4.1.2 Reduction of Terrorist Influence

Successful containment of the Al-Shabaab and allied extremist groups has been listed as one of the clearest signs of effectiveness by the respondents since it has led to the reduction of attacks, networks, and movement of terrorists along the border between Kenya and Somalia.

Table 3

Reduction of Terrorist Influence

Sub-theme	Frequency of Mentions	Illustrative Focus
Al-Shabaab containment	12	Disruption of bases, decline in attacks
Reduced recruitment	6	Fewer youth are being radicalized, prevention of ISIS expansion
Restricted movement	6	Border restrictions, interception of operatives

During interviews conducted in Mandera Town, Kenya (September 2025), several security experts emphasized that joint counter-terrorism (CT) initiatives had significantly weakened Al-Shabaab's operational capability. One key informant remarked:

> "*Our cooperation with Kenya has been good because at least we can say we have reduced the role of Al-Shabaab in places they once controlled like Kismayo." (*Interview with Somali security official, Bulohawo, September, 2025*)*

Similarly, another respondent highlighted a decline in youth radicalization:

> *"Radicalization and recruitment of youths have also dwindled over time*."(Interview with Kenyan border intelligence officer, Mandera, September 2025)

Enhanced border surveillance was also credited with constraining terrorist mobility:

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> "*The strategies have helped to restrict the movement of terrorists along the borders."* (Interview with local administrator, Mandera, September , 2025)

These direct descriptions show that bilateral cooperation of CT has not only provided concrete operational results, but also confidence among the local security stakeholders. The decreasing trend in the number of attacks and recruiting is similar to the quantitative results, which evaluated the decrease in terrorist attacks (Mean = 3.54) as one of the most effective dimensions of bilateral CT strategies. This shows that joint military activities, exchange of intelligence and cross-border patrolling have all increased security within the region. However, the continuing information flow and community-based deradicalization programs will be the key to maintaining such gains to avoid the re-emergence of extremist networks.

4.1.3 Most Effective Components

Respondents were also requested to point out what they believed to be the most effective areas of Kenya-Somalia counter-terrorism (CT) coordination with regard to countering terrorist threats. The qualitative data yielded three prevailing themes, namely, intelligence sharing, joint operations, and de-radicalization programmes.

Table 4

Most Effective Components of Counter-Terrorism Strategies

Sub-theme	Frequency of Mentions	Illustrative Focus
Intelligence sharing	13	Real-time data, prevention of attacks
Joint operations	11	Coordinated missions, capacity building
De-radicalization programs	7	Reintegration, reduced recruitment

Interviews conducted in Mandera (Kenya) and Bulohawo (Somalia) in *September 2025* consistently underscored that *intelligence sharing* was the backbone of bilateral CT efforts. One key informant emphasized:

> "*Intelligence sharing is the most important because it fills gaps and allows us to catch up with terrorists before they carry out attacks."* (Interview with Somali National Army officer, Bulohawo, September 2025)

This sentiment reflects a common understanding that information exchange enables early detection, swift response, and reduced duplication of security efforts. The data suggest that such collaboration has enhanced preventive capacities and reduced the operational latitude of terrorist cells across the border. The second most frequently mentioned component was *joint operations*. Respondents noted that joint missions foster mutual learning, resource pooling, and cross-border synergy:

> "*Joint operations have been very significant because they bring together our forces, intelligence units, and even logistics to coordinate counter-terrorism actions effectively." (*Interview with KDF intelligence liaison, Mandera, September 2025*)*

This perspective demonstrates that coordinated field engagement between Kenyan and Somali forces strengthens the collective response to evolving threats while promoting interoperability between security agencies.
Finally, *de-radicalization programs* were recognized as a sustainable approach to long-term peacebuilding. As one respondent noted:

> "*De-radicalization is the best strategy since it reduces the number of new recruits who would otherwise become field operators for terrorist organizations*."*(*Interview with community peace facilitator, Mandera, September 2025)

This observation reinforces the argument that soft-power interventions—focused on ideological rehabilitation and community reintegration- complement military and intelligence operations by addressing the human dimensions of terrorism.

Collectively, these findings suggest that the most effective CT outcomes arise from a *hybrid strategy* that integrates intelligence-led operations with collaborative field missions and preventive de-radicalization measures. This aligns with neorealist logic emphasizing alliance-building for mutual security, while also resonating with securitization theory's focus on socially constructed responses to perceived threats.

4.1.4 Gaps in Counter-Terrorism Strategies

Despite the good achievements recorded, the respondents identified that there were several recurrent gaps that were undermining the effectiveness of the bilateral strategies in general. They included poor resources, technology, absence of community empowerment, and poor coordination systems.

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Table 5
Reported Gaps in Counter-Terrorism Strategies

Sub-theme	Frequency of Mentions	Illustrative Focus
Community empowerment	4	Clan dynamics, lack of civic support
Inadequate resources	7	Funding constraints, skill shortages
Technology gaps	10	Online radicalization, drones, and cryptocurrencies
Weak coordination	2	Gender-insensitive approaches, AU-level debates

According to the respondents, terrorism succeeds when communities are perceived to be sidelined or not taken care of:

> "*Economic empowerment has the potential of making the region a better place since many communities feel neglected*".*(*Interview with KDF intelligence liaison, Mandera, September 2025*)*
> Another common constraint as mentioned, was funding and shortage of skills:
> "*All operations or plans have limitations which we tend to experience and, in this case, financial limitations*." *(*Interview with KDF intelligence liaison, Mandera, September 2025*)*

One of the main worries was that the technological lag behind the terrorist circles was significant:

> "*The way of the terrorist outfits is nowadays improved, too. They are employing drones and cryptocurrencies in logistics and finance*." *(*Interview with KDF intelligence liaison, Mandera, September 2025*)*

These results highlight the fact that, as much as there has been improvement, sustainability and flexibility are in danger because of inadequate resourcing, lack of technological investments, and disproportionate community attention.

4.1.5 Monitoring and Evaluation of Strategies

The respondents highlighted the significance of monitoring and evaluation (M&E) systems to achieve performance tracking, foster accountability, and adaptive learning within CT operations.

Table 6
Monitoring and Evaluation of CT Strategies

Sub-theme	Frequency of Mentions	Illustrative Focus
Community empowerment	4	Clan dynamics, lack of civic support
Inadequate resources	7	Funding constraints, skill shortages
Technology gaps	10	Online radicalization, drones, and cryptocurrencies
Weak coordination	2	Gender-insensitive approaches, AU-level debates

The issue of community perceptions was stated as the key indicator of success:

> *"The local population can serve as a measure of success. When the locals embrace the strategies or leave terror groups, it is a sign that it is effective." (*Interview with KDF intelligence liaison, Mandera, September 2025*)*

Existing structures also integrated formal review mechanisms:

> *"We also have quarterly review meetings under the AUSOM, IGAD, and the UN mission in Somalia, and check whether our strategies are working or not." (*Interview with KDF intelligence liaison, Mandera, September 2025*)*

Regular changes were mentioned as a crucial part of flexibility:

> *"They are reviewed every quarter by examining which strategies have the most success." (*Interview with KDF intelligence liaison, Mandera, September 2025*)*

All these insights, together, point to the fact that strong M&E systems make it possible to persist in continuous improvement, establishing learning and responsiveness to the changing nature of terrorism in the region.

4.2 Discussion

The results of the study have shown that Kenya and Somalia have recorded some significant gains on counteracting the operational capacities of terrorist organizations especially through better intelligence coordination, combined security operations and increased cross-border patrols, however, overall efficiency of their bilateral counter-terrorism framework is still hampered by structural issues. The respondents have admitted to the reduction in the rate and intensity of Al-Shabaab attacks in Mandera and Bulohawo. Nevertheless, they have also focused on the fact that the gaps in governance, institutional vulnerabilities, and socio-economic marginalization still form conditions in which

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radicalization and the ability to resist extremism flourish. These observations can be compared with the claim according to which counter-terrorism efficacy is fundamentally multidimensional and depends on the ability to balance the coercive options with the community-based and preventive initiatives (Montasari, 2024).

The centrality of human-security-driven solutions was supported on the basis of the community views of Mandera and Bulohawo. Economic deprivation, political marginalization, and poor service provision were among the key motivators to radicalization as cited by respondents numerous times over. These data point in the same direction as researchers claim that inadequate inter-agency response and the lack of inclusive and community-based approaches to counter-terrorism strategies negatively affect the sustainability of the final results in the long run (Botha, 2021). Although its operations improved, a large number of the respondents believed that Kenya-Somalia collaboration is still disjointed because of bureaucratic delays, imbalanced distribution of resources, and vested national interests. This fact is repeated by previous studies that suggest that regional CT structures are commonly disjointed and feature distrust among partnering states (Onuaha, 2020).

The fact that the bilateral CT mechanisms have not gone beyond the point of limited self-reliance in the Horn of Africa is also evidenced by the persistence of external factors, such as the African Union, the United Nations, and other external donors. The respondents mentioned that the intelligence sharing and joint operations are the most useful elements of the partnership; however, since there are no standardized evaluation systems, interoperable technologies, and strategic planning frameworks, the partnership cannot become more deeply institutionalized. It aligns with the research results those bilateral arrangements are the most successful in the context of being integrated in the larger regional and international regimes on security matters (Onuoha, 2020).

In theory, the results indicate that the Securitization Theory is used to describe why Kenya and Somalia referenced the discursive construction of terrorism as an existential threat. This framing has justified extraordinary measures such as foreign military intervention, broader spy activities, and emergency act as per the reason presented by Buzan et al. (1998). The securitized policy priorities can be seen in the focus of the respondents on military solutions, rapid response units, and increased surveillance technologies. Nevertheless, the results also show the weaknesses of securitization: it has strengthened the militarist-based response at the expense of developmental and community-oriented interventions as a long-term resilience factor. As the experts caution, privatization is biased towards short-term containment and covering structural causes of violent extremism (McGlinchey, 2021).

Neorealism also explains why Kenya and Somalia still work together even though they had mistrust in history and domestic unrest. Under an anarchic regional order, states respond to self-help policies through mutual vulnerability, and thus pragmatic collaboration against Al-Shabaab is a sensible decision (Waltz, 1979). The results of the study prove that bilateral cooperation is driven by the necessity of security but not common values and normative commitments. But the contemporary terrorism is also characterized by threats like attacks via drones, encrypted messages, and anonymous funding of terror, which are not limited to conventional territorial logics. This questions the neorealism assumptions that are state-centric and emphasizes the necessity of flexible and technology-oriented security policies.

In general, there is evidence to indicate that Kenya-Somalia bilateral counter-terrorism activities are yielding short-term operational successes, but are yet to achieve structural stability or long-term resilience. The alliance is predetermined by securitized and neorealist interests, contributing to an increase in the level of tactical coordination but being insufficient to ensure the socio-economic and political environment that contributes to violent extremism. These observations help substantiate the hypothesis that a hybrid security model is needed in sustainable counter-terrorism in the Horn of Africa, a model that incorporates coercive capacity and preventive governance, technological modernization, and integrative community participation. It agrees with scholars who think CT's efficacy is based on the rise in institutional legitimacy, public trust, and state flexibility, not just the drop in attacks (UNOCT, 2023).

In the case of Kenya and Somalia, it means that the empowerment of the youth, the investment in the development projects across borders, the development of digital intelligence, and the institutionalization of the participation of the community are the necessary measures that would help in the transformation of short-term tactical victory into long-lasting peace and the stability of the region.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This paper confirms that re-securitization of Kenya-Somalia borderlands has been associated with quantifiable but partial benefits in curbing the operational effects of terrorist organizations within the Horn of Africa. Two-way collaboration due to similar threat perceptions and strategic interdependency has improved intelligence coordination, interfered Al-Shabaab networks, and eliminated cross-border incursions. The theoretical hypotheses of the Securitization process and Neorealism are supported by these developments that show how the mode of framing terrorism as existential threat and operation in an anarchic system facilitates the mobilization of extraordinary resources and the establishment of practical alliances to survive.

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Nevertheless, what the findings also show is that these securitized and neorealist logics, though effective in marshalling resources and coordinating activities, has strengthened a militarized view of security at the expense of governance, socio-economic inclusion and community involvement. Institutional incoherence, technological gaps, and weak presence of the state in frontiers make the non-state actors to still have functional authority. The paper has thus argued that Kenya-Somalia frontier stabilization is to be achieved through the shift in logic of re-securitization towards coercive containment to inclusive governance. The long-term peace will require the alignment of military strength and legitimacy whereby restoration of state power is not done by control, but with trust, development and civic integration that will tie the borderlands to the political and moral space of the state.

5.2 Recommendations

In order to strengthen the Kenya-Somalia bilateral counter-terrorism cooperation effectiveness and sustainability, a number of mutually dependent steps should be made. To begin with, the two governments ought to formalize their cooperation by creating a standing bilateral counter-terrorism coordination secretariat that is based on the respective ministries of interior. The result of such an institutional mechanism would be the standardization of intelligence sharing, coordination of joint operations and policy accountability framework which would curb the lack of coherence in operations that is currently being experienced. Second, the alliance should focus on technological modernization in order to deal with asymmetrical threats that are being created. Early-warning against online radicalization, drone warfare and cryptocurrency-based financing networks would be enhanced by investing in digital surveillance, predictive analytics and cyber-defense systems. Technological capacity creation would also improve the level of interoperability between security agencies as well as the ability to respond to changing risks in real-time.

Third, community-based initiatives in the security fabric determine the success of counter-terrorism in the Horn of Africa. Cross border development programmes that would increase youth employment, entrepreneurship and civic education would help solve the underlying socio-economic grievances that perpetuate extremist recruitment. The development of Mandera and Bulahawo as local actors would change the citizens of both regions into active participants of security, rather than mere subjects of it, enhancing trust between the state and the frontier population. Fourth, adaptive mechanisms of governance, which facilitate the learning and constant accountability of the policies, should be embraced by both states. Combined with structured community feedback, joint monitoring and evaluation systems would be used to produce empirical data that would be used to gauge performance and to make sure that strategies are responsive to their context. This reflexive governance would entrench the culture of iterative perfection into the counter-terrorism institutions. Lastly, Kenya and Somalia ought to incorporate their bilateral endeavors in the regional and multilateral platforms under the IGAD and the African Union to align the intelligence systems and joint security actions. The Horn of Africa terrorism activities are beyond the borders of the states; hence, not that coordinated regional mechanisms cannot guarantee the strategic depth and continuity of the policy.

REFERENCES

African Union. (2024). *ATMIS progress report: Stabilisation and counter-terrorism operations in Somalia*. https://au.int

Agbiboa, D. E. (2023). *They eat our sweat: Transport labour, corruption and everyday survival in urban Nigeria*. Oxford University Press. https://doi.org/10.1093/oso/9780192868151.001.0001

Barkin, J. S. (2010). *Realist constructivism: Rethinking international relations theory*. Cambridge University Press.

Booth, K., Wheeler, N. J., & Dunne, T. (2020). Security dilemmas in asymmetric conflicts. *International Affairs, 96*(1), 1–20. https://doi.org/10.1093/ia/iiz254

Botha, A. (2019). Political fragility and violent extremism in the Horn of Africa. Institute for Security Studies. https://issafrica.org/research

Botha, A. (2021). Terrorism in Kenya: Recruitment and radicalisation in Kenya's urban centres. Institute for Security Studies. https://issafrica.org/research/east-africa-report/terrorism-in-kenya-recruitment-and-radicalisation-in-kenyas-urban-centres

Bryden, M. (2023). Reassessing Al-Shabaab's regional threat. Center for Strategic and International Studies. https://www.csis.org

Buzan, B., Waever, O., & de Wilde, J. (1998). *Security: A new framework for analysis*. Lynne Rienner Publishers. https://www.rienner.com/title/Security_A_New_Framework_for_Analysis

Dewdney, J. (2018). Nationalist narratives and the politics of securitization. *Journal of International Relations and Development, 21*(3), 511–530. https://doi.org/10.1057/s41268-017-0104-6

Donnelly, J. (2019). Structural realism revisited: The limits of neorealist analysis. *International Relations, 33*(2), 238–254. https://doi.org/10.1177/0047117819834622

Hassan, M. (2022). Al-Shabaab's evolving governance and security strategy. *Journal of Eastern African Studies, 16*(4), 623–642. https://doi.org/10.1080/17531055.2022.2061304

Licensed Under Creative Commons Attribution (CC BY-NC)

Hayes, B., Jones, C., & Marquez, R. (2020). The privatisation of security: Commercial interests and policy influence in counter-terrorism. Transnational Institute. https://www.tni.org/en/publication/the-privatisation-of-security

Institute for Economics & Peace. (2024). *Global Terrorism Index 2024*. https://www.visionofhumanity.org

International Crisis Group. (2023). *Stopping the spread of extremism in East Africa*. https://www.crisisgroup.org

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement, 30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Lieven, A. (2020). The militarization of Western security policy. *Survival, 62*(5), 7–28. https://doi.org/10.1080/00396338.2020.1819645

Lind, J. (2022). Securing Kenya's borderlands: State authority and local security arrangements. Rift Valley Institute. https://riftvalley.net/publication/securing-kenyas-borderlands

McGlinchey, S. (2021). Securitization and the power of discourse in conflict settings. *International Affairs Review, 29*(1), 1–18. https://iar-gwu.org

Mearsheimer, J. J. (2014). *The tragedy of Great Power politics* (Updated ed.). W. W. Norton. https://wwnorton.com/books/9780393349276

Montasari, B. (2024). Assessing the United Kingdom's evolving CONTEST counter-terrorism strategy. *Policy Studies, 45*(1), 55–72. https://doi.org/10.1080/01442872.2022.2132857

Onuoha, F. C. (2020). Collaborative approaches to countering Boko Haram in the Lake Chad Basin. *African Security Review, 29*(2), 120–137. https://doi.org/10.1080/10246029.2020.1735204

Republic of Kenya. (2022). *National Strategy to Counter Violent Extremism* (Revised ed.). https://interior.go.ke

U.S. Department of State. (2023). *Country reports on terrorism 2023*. https://www.state.gov/reports

United Nations Office of Counter-Terrorism. (2023). *Global counter-terrorism update*. https://www.un.org/counterterrorism

Waever, O. (1995). Securitization and desecuritization. In R. Lipschutz (Ed.), *On security* (pp. 46–86). Columbia University Press. https://cup.columbia.edu/book/on-security/9780231101953

Waever, O. (2015). The Theory Act: Responsibility and critique in securitization theory. *Security Dialogue, 46*(4), 337–354. https://doi.org/10.1177/0967010615585732

Waltz, K. N. (1979). *Theory of international politics*. Addison-Wesley. https://press.princeton.edu/books/9780691203481

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Impact of the Meru KOPIA project on poultry farmers' income in Meru County, Kenya

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ABSTRACT

Most farming households in Kenya keep indigenous chickens in scavenging systems characterized by low productivity. In response to this, the Korea Program on International Agriculture (KOPIA) center in Nairobi collaborated with the County Government of Meru to disseminate localized technologies and provide technical support to indigenous poultry farmers using the model village approach. The aim of this paper is to assess the impact of the project on participating poultry farmers' income in Meru County, Kenya, as promoted by the KOPIA. Descriptive cross-sectional survey research was adopted to achieve the objectives of the paper. Data was collected from beneficiaries and a control group through a survey of 236 households using researcher-administered questionnaires sampled from a population of 400 farmers drawn from the 4 participating villages. The study was based on the rational choice theory. Propensity score matching was used to compute the average treatment effect on the treated. Using the nearest neighbor, caliper-based, and kernel-based matching methods, the results showed evidence that program beneficiaries increased their annual income from poultry production, ranging from Kshs 66,616 to 81,674. Being located in Mbaria, Ng'onyi, and Ntalami model villages, the number of livestock enterprises, the number of eggs sold, the number of hens sold, and egg production per hen influenced the impact of the project. The study recommends the establishment of more model villages so as to spread the benefits to a wider area. Future efforts should include addressing constraints in marketing and group cohesion so as to increase the benefits to the participating farmers. Assisting farmers to form a marketing cooperative will not only increase market participation but also benefit farmers from collective procurement of inputs as well as credit for enterprise expansion.

Keywords: Impact, Indigenous Chicken, Kenya, Meru County, Smallholder Farmers

I. INTRODUCTION

With the expected increase in population, agriculture will have to make noticeable adjustments to produce enough food. However, reduced productivity of the major crops and livestock enterprises, has affected the majority of African countries whose economies rely on agriculture leading to high levels of poverty and hunger (Wiebe et al., 2021). Agriculture, the mainstay of Kenya's economy, plays a critical role in ensuring food and nutrition security for the Kenyan population. The sector contributed approximately 23 percent of total Gross Domestic Product (GDP) and an additional 17.1 percent to GDP through linkages to other sectors such as manufacturing, distribution and services (Kenya National Bureau of Statistics, 2021). Product diversification is thus an important aspect of agribusiness strategy especially for small scale producers for increased profitability, reduction in risk, increasing competition, higher growth and more efficient resource allocation.

In the limited livelihoods diversification that poor households tend to have, livestock constitutes an important source of income and in general comprises the most important asset. In some of the developing countries including Kenya, rural poultry farming has been recognized as an important tool for income generation as well as improvement of livelihood for the rural poor (Acosta *et al.*, 2021). The birds are kept and raised in a wide range of production systems, and provide mainly meat, eggs and manure. In addition, chicken buffer households' income and consumption shock since livestock holders usually first sell small animals such as poultry. Poultry is thus an important enterprise for small holders making it one of the fastest growing agricultural sub-sectors (Mottet & Tempio (2017).

In Sub Saharan Africa (SSA), rural chicken production accounts for about 60% of poultry with indigenous chickens constituting 70% of the total chicken population (Kejela et al., 2019). In Kenya, poultry production remains a key enterprise among smallholder farmers (Ayieko et al., 2015), with about 70% of the rural population deriving their livelihood from poultry production (Kamau et al., 2018). Further, the poultry enterprise has been identified as an exit strategy in addressing food scarcity among rural households (Milkias et al., 2019). However, the production of indigenous poultry among smallholder farmers encounters several challenges. In Kenya, the challenges include the

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rising costs of farm inputs resulting from competition of key raw materials (Abadi et al., 2018). In addition, poultry farmers are unable to control diseases related to poultry as a result of the increasing costs of vaccines and management fees (Milkias et al., 2019). There is limited information regarding both input and output markets which leads to stiff competition within the industry (Abadi et al., 2018).

Demand for animal food products in developing countries like Kenya is rising and the trends in consumption and production strongly suggest that much of the demand for meat will have to be met through increased poultry production (Delgado et al., 2001). Further opportunities are expected within the chicken industry, which is projected to record the highest growth of 121% within the livestock sub-sector by the year 2050 (Mottet & Tempio, 2017). Developing countries like Kenya are expected to play a key role in spurring this growth at the rate of 2.4% compared to 1.8% at the global level for chicken production (Mottet & Tempio, 2017).

Most indigenous chickens in Africa are farmed in traditional scavenging systems (Guèye, 1998). They are better adapted to the scavenging systems, where they are exposed to disease, food that is deficient in quantity and quality, poor housing and health care. Management interventions are limited or non-existent under these systems (Tadelle et al., 2000). Thus, despite the capacity of indigenous chicken to contribute to the economy and reduce poverty levels among the poor rural households, the enterprise is still constrained by low productivity and slow maturity (Kenya Agricultural Research Institute [KARI], 2011; Kingori et al., 2010). To address these constraints improved indigenous chicken (IIC) technologies have been developed and introduced to smallholders.

The importance of agricultural technology adoption in ending poverty and food insecurity has been well discussed. Technology adoption is expected to increase productions, efficient uses of inputs, and farmers' income. The adoption of yield increasing technologies, in Asia, resulted with what is known as the Green Revolution (World Bank, 2008) and its replication in African countries is considered to be important for increasing productivity. Various studies have shown that technologies have positively increased farm productivity including poultry technologies (Mwiti et al., 2021), improved varieties (Hailu et al., 2014; Addison, 2022, Mensah et al., 2021), Chemical fertilizers (Hailu et al., 2014; Addison, 2022), mobile phone-based money transfer services (Kirui et al., 2013), genetically modified (GM) crop technology (Brookes, 2022), and climate resilient technologies (Samuel et al., 2021). The multiplier effect is expected to increase income and food security, alleviate poverty and generally improve the welfare of small farmers.

In Kenya, just like in other sub-Sahara Africa (SSA) countries, productivity lags behind that of other regions in the world, and is well below that required to achieve food security and poverty goals. One way of increasing agricultural productivity is through introduction and use of improved agricultural technologies. However, inadequate assimilation of technology is limiting the rate of agricultural growth over time, and thus affect both quantity and quality of what is produced. The National Agricultural Sector Extension programme (NASEP) (Government of Kenya, 2012) addressed these weaknesses by articulating the importance of clientele participation and demand driven extension system. The implementation of this policy was envisioned to contribute towards improved transfer of technology and management for higher agricultural sector productivity, a key prerequisite to poverty reduction and enhanced food and nutrition security.

Intensification of agricultural production and diversification into relatively more profitable and competitive livestock enterprises is one of the options to increase food production and reduce rural poverty. The IIC breeds have the potential of transforming livelihoods of populations in the developing countries of the world including Kenya. However, Kamau et al (2019) notes that only a few smallholder farmers have adopted the IIC technologies. In many areas of Kenya where rural livelihoods depend heavily on subsistence farming, using IIC breeds provides an opportunity to increased poultry productivity in smallholder agriculture and thus raise household income and reduce poverty.

Technological changes in agricultural production practices thus remains the main drivers of the sector's growth. However, given smallholders' limited access to productive resources, technologies, and markets, it is imperative to consider productivity improvements through provision of modern technologies. The KOPIA (Korea Project on International Agriculture) project in collaboration with the Meru County Government, department of livestock development embarked on a program to improve the performance of indigenous chicken value chains among small scale farmers by disseminating localized technologies and practices through the model village approach. The selected poultry farmers received training on poultry production practices, received day-old and month-old improved indigenous chicken chicks. Members of model villages were also provided with incubators to increase their access to improved indigenous chicks. In addition, social halls equipped with screens were constructed in the model villages which acted as meeting and learning centers.

The shift from free-ranging flocks to confined poultry operations was expected to increase the number of birds per farmer, facilitate the substitution of capital for labour, and lead to a significant increase in productivity. An impact evaluation will identify how the project addresses the main development problems in the area and quantify the impact of the project to the beneficiaries. Using data from participating (treatment group) and non-participating (control group) farmers in the model villages, this knowledge gap was addressed by assessing the impact of KOPIA project on the income of small holder indigenous chicken farmers in Meru County. The fact that low adoption of new technologies

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and innovations has been identified as a contributing factor to the decline in agricultural productivity means that although Kenya has a well-structured agricultural research system, small scale farmers will still experience low incomes.

According to the Meru County Socio Economic Indicators baseline survey (2016), 89% of the households in Meru County practice agriculture while 63% of all enterprises owned are in the agriculture sector. The 2019 Kenya Population and Housing Census in 2019 estimates that over 89% of the estimated 426,360 households in Meru keep chickens or some other poultry, making the local chicken a main source of income and employment. Dilley et al. (2021), reported that a majority of those in Meru County envision a future which involved some agricultural activity with most indicating that they saw their imagined future involving a mix of activities. Thus, productivity change using existing technologies with better input allocation or modern technologies with available inputs would contribute to economic sustainability. The Meru County Government Vision 2040 (Meru County Government, 2019) recognizes that to improve smallholder farm productivity and increase farm households' incomes, it is important to transform the sector into a profitable, commercial oriented and competitive economic activity. Plans for the livestock sector includes disease control with emphasis on prevention, reducing the cost of production to have a competitive advantage, commercialization of livestock farming, improved breeding, improvement of feed, support of processing and marketing, supporting farmers with agricultural equipment and with subsidized inputs.

1.1 Statement of the Problem

The improved indigenous chicken breeds have the potential of transforming livelihoods of populations in the developing countries. They provide an opportunity to increase poultry productivity in smallholder agriculture and thus raise household income and reduce poverty. However, given smallholders' limited access to productive resources, technologies and markets, it is imperative to consider productivity improvements through provision of modern technologies. The KOPIA project in collaboration with the Meru County Government embarked on a program to improve the performance of indigenous chicken value chains among small scale farmers. The aim was to increase the number of birds per farmer, facilitate the substitution of capital for labour which was expected to significantly increase in productivity and income. However, the impact of the intervention on the welfare of the beneficiary smallholder poultry farmers in Meru County is not well understood. Using data from participating (treatment group) and non-participating (control group) farmers in the model villages, this knowledge gap was addressed by assessing the impact of KOPIA project on the income of small holder indigenous chicken farmers in Meru County.

1.2 Research objective

The aim of this paper aimed at quantifying the impact of the KOPIA programme on poultry farmers' income in Meru County, Kenya

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was based on the rational choice theory proposed by economist Adam Smith in 1776. The theory assumes that decision to participate in a project is motivated by expected gains. Farmers are rational consumers of new technologies and will adopt technologies in anticipation of increased productivity and will therefore choose the most preferred alternative. According to Neumann and Morgenstern (2007) preference of new technology will be made if its expected utility exceeds that of the traditional technology. Hence the decision to participate in the KOPIA project activities will be realized if the expected utility for participating is greater than the utility for not participating.

Impacts evaluations are done to answer cause and effect questions, which evaluate the outcome and asses the differences an intervention makes in an outcome (Rosebaum & Rubin, 1983). Since the outcome of the same individual cannot be simultaneously obtained with and without the program, impact assessment establishes with as much certainty as possible, whether or not an intervention produces its intended effects. There are two approaches to study the impact of a given project: the 'before and after' and the 'with and without' approaches. Before and after analysis compares the performance of key variables during and after the program, with those prior to the implementation of the program. With and without comparisons compares the behavior in the key variables in a sample of program beneficiaries, with their behavior in non-program group (a comparison group). This is an approach uses the experiences of the comparison group as a proxy for what would otherwise have happened in the program beneficiaries. These approaches use statistical methods to evaluate whether there is a significant change in some essential variables over time.

Although impact evaluation has taken different meanings, this study considered it as an assessment of the impact of an intervention on final welfare. According to White (2006) impact evaluation is concerned with establishing the counterfactual, i.e., the difference the project made (how indicators behaved with the project compared to how they would have been without it). The appropriate counterfactual is most usually defined with reference to a control group, which has to be identified in a way in which avoids selection bias, meaning the use of either experimental or quasi-

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experimental approaches. An evaluation of impact is therefore important to comprehend the effects of participating in the KOPIA programme on the recipients' increased income.

2.2 Empirical Review

2.2.1 Assessing the Impact of KOPIA Project

Impact evaluation is important for determining whether a program is making a difference to people, groups, organizations or communities (Streatfield & Markless, 2009) Thus, the approach was used to determine the effect of KOPIA project on income for poultry farmers in Meru County, Kenya. Literature identifies three main kinds of impact evaluation designs. These are experimental, quasi-experimental and non-experimental. In experimental or randomized control design method selection into the treatment and control groups is random within some well-defined set of people. In this case there should be no difference between the two groups besides the fact that the treatment group had access to the program. Non-experimental or quasi-experimental design methods are used to carry out an evaluation when it is not possible to construct treatment and comparison/control groups through experimental design. These techniques generate comparison groups that resemble the treatment group, at least in observed characteristics. The econometric methodologies include difference in difference methods, reflexive comparisons, instrumental variables methods and matching methods (Baker, 2000).

Evaluating program effectiveness without a randomized control is a frequent necessity in most public programmes. Matching techniques have gained prominence in impact evaluations with the most widely used type of matching is propensity score matching (PSM), in which the comparison group is matched to the treatment group on the basis of a set of observed characteristics in the form of a propensity score. The propensity score is the predicted probability of participation in an intervention given observable characteristics. Propensity-score matching is a non-experimental method for estimating the average effect of social programs (Rosenbaum & Rubin, 1983; Heckman *et al.*, 1998). The nature of treatment may be very diverse which according to Barbara, (2009) and Ali & Abdulai, (2010) makes matching the best available method for selecting a matched comparison group which 'looks like' the group of interest. PSM was thus used in the study.

To analyse the effect of participation in the KOPIA project on income, Propensity Score Matching **(**PSM), a quasi-experimental approach was used to analyze the impact of the project in Meru County. According to Kono and Takashi (2010) and Stuart (2010), Average Treatment Effect (ATE) and Average Treatment Effect on the Treated (ATT) can be used to directly measure the impact of participating in the project activities on the target group. The assumption will be that those who participated and those that did not participate in the KOPIA project could have the same income except for the intervention of the project. The impact of treatment for individual i, noted δi, is defined as the difference between the potential outcome in case of treatment and the potential outcome in absence of treatment (Hulme, 2000)

$$\delta_i = Y_{1i} - Y_{0i} \quad (1)$$

Y_{1i} and Y_{0i} are mutually exclusive because the same individual cannot participate or not participate at the same time (Heckman et al., 1997). In general, the evaluation seeks to estimate the mean impact of a program, obtained by averaging the impact across all the individuals in the population. This parameter is known as ATE:

$$ATE = E(\delta) = E(Y_1 - Y_0) \quad (2)$$

Where E(.) represents the average (or expected value).

ATT measures the impact of the program on those individuals who participated:

$$ATT = E(Y_1 - Y_0 | D = 1) \quad (3)$$

Where; Y is the income from chicken in a year, Y_1 is the observed income for the treated, and Y_0 is the counterfactual. The expected value of the ATT is defined as the difference between expected outcome values with and without treatment for those who participated in treatment.

The treatment sample refers to those who have participated in the KOPIA project activities as members of poultry model villages. A group of those who did not participate in the project activities served as the control group to control for selection bias. The purpose of matching was to estimate the counterfactual outcome and correct for selection biases created by non-random sampling of those who have participated in the project. To estimate ATT based on propensity scores, alternative matching methods to assess the effect of the project will be compared; Nearest neighbor matching, Kernel matching, and Caliper matching methods.

A Logit model was applied to estimate the propensity scores of participating in the project. The Binary Logit Regression model was used to examine the determinants of participation in KOPIA project activities by poultry farmers. The logit model was used for the binary outcomes of dependent variable. The dependent variable was the choice by farmers either to participate in the KOPIA project or not (Participants and non-participants). Score of 1 was given if yes and 0 otherwise.

$$ln(\frac{pi}{1-pi}) = pr(D_i = 1) = b_0 + b_1 x_1 + b_2 x_2 \dots\dots\dots b_n x_n + e_i \quad (4)$$

Where;

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$\ln\left(\frac{pi}{1-pi}\right)$ is the log of odds ratio = LOGIT

$b_0, b_1, b_2 \ldots\ldots\ldots b_n$ are the logit coefficients to be estimated.

$x_1, x_2 \ldots\ldots\ldots\ldots\ldots\ldots x_n$ are the independent variables and e_i is the error tem.

The Logit model was used to estimate project participation as a function of the observable characteristics.

2.2.2 The KOPIA Project in Meru County

The South Korean Rural Development Administration (RDA) through Korea Program on International Agriculture (Now Korean Programme for International Cooperation in Agricultural Technologies-KOPIA) supported an Indigenous Chicken Technical Cooperation Project (TCP) in Meru County. The project's main aim was contributing to raising the food security, nutritional status and wealth of the Meru County smallholder households through increased production in terms of number of eggs laid per chicken, number of chickens growing to maturity per household, amount of meat gained per chicken in the shortest time and the number of chickens sold. The project also envisaged to realise increased profits to the farmers due to increased access to financial access and strengthened marketing strategies.

The Meru-KOPIA indigenous chicken project targeted regions in the county that predominantly receive low and poorly distributed rainfall leading to frequent crop failure. The indigenous chicken is one of the main sources of income and employment. The village model chicken production and marketing-based outreach project promoted the resilient improved indigenous chicken which thrives under the low input-output system in selected smallholder households in Meru County Kenya. The project is implemented by County Government of Meru department of Agriculture, Livestock development and Fisheries (MERU-ALF) in collaboration with the KOPIA Center in Nairobi, Kenya.

The selection of the model villages beneficiary households was done through community participatory processes involving the local national government administration, the county government leaders, local churches and support groups, non-state actors' representatives, the department of Agriculture and Livestock development and the local community leaders. In a bid to reorganize and strengthen the participating farmers into cohesive groups, the implementation approach involved formation of four (4) smaller common interest groups (CIGs) in each of the selected model villages. Social cohesiveness, geographical distribution, poverty and vulnerability indices, willingness to participate in the chicken production and gender considerations were critical in the selection of the participating households.

In order to enhance chicken productivity at the farm level and hasten adoption of innovations, the project procured and distributed improved indigenous chicks amongst the model village beneficiaries. Beneficiaries were also supported with additional amenities to improve poultry production including a social hall fitted with screens and furniture, borehole, hatchery unit, incubators, power generators, motorcycle and office equipment. The farmers in the model villages were capacity built on skills and knowledge in chicken production and marketing. A detailed training curriculum was developed by the technical department of Meru-ALF covering topics in chicken production systems, feeding and nutrition, record keeping, ration formulation, incubation and brooding, health management, entrepreneurship, chicken housing and equipment, marketing, group formation and dynamics, management, leadership and financial literacy

The study will provide empirical evidence of the impact of the KOPIA programme on poultry farmers' productivity and income. Therefore, this paper aims at quantifying the impact of the KOPIA programme among smallholder indigenous chicken farmers in Meru County of Kenya. The analysis will highlight the scale of the opportunity of access to technologies and evaluate its scope to increased income from agricultural production. The remainder of the paper is organized as follows: Section 2, explains the materials and methods applied in data collection and analysis section 3 presents the results and discussion from data analysis and section 4 presents the conclusions and policy implications.

III. METHODOLOGY

3.1 Study Area

The study was carried out in Meru County, Kenya. Meru County is an agricultural county located on the eastern side of Mt. Kenya with a total of 423,848 households out of which 64.7% are farming households (KNBS, 2021). According to Republic of Kenya (RoK) (2013), Meru has an altitude that lies between 2230 and 2900m above the sea level, lies between longitudes 38° East and 37° West and also along the equator at latitudes 0°6′ North and 0°1′ South. It is made up of 45 Wards and 9 Sub- Counties, namely; Tigania West, Tigania East, Igembe Central, Igembe North, Igembe South, Imenti North, Imenti South, Central Imenti, and Buuri (RoK, 2013). Meru County is characterized by four main agro-ecological zones; the upper highlands, the lower highlands, the upper midlands and the lower midlands which is a semi-arid area. (Jaetzold et al., 2007).

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Livestock rearing is a common enterprise in Meru, with a population of 274,081 livestock farming households out of which 71% are subsistence livestock farmers (Ministry of Agriculture, Livestock and Fisheries, 2019). Livestock constitute 52% of the households' income (Mwendia et al., 2020), an indication that it is a key income earner for families in the area. Meru is the leading producer of indigenous chicken in Eastern Kenya, with a population of over 1.3 million IC (Ministry of Agriculture, Livestock and Fisheries, 2018), with production concentrated among farmers in Tigania West. Although the average farm size differs from one agro-ecological zone to another, the average land holding size per household is 1.8 ha (County Government of Meru, 2018) which according to FAO definition (Khalil et al., 2017) are considered as small scale producers.

3.2 Research Design

A descriptive cross-sectional survey research design was adopted to achieve the purpose of this study. This design enabled the researcher to make inferences and generalizations about the population of interest.

3.3 Target Population

The project had been implemented in Meru County where the area of coverage for intervention was done through public participation of the policy makers depending on various factors among them being suitable agro ecological zone, areas who have minimal or little support from other development partners. A total of 400 small scale farmers from Mbaria, Ng'onyi, Ntalami and Kangeta model villages who participated in the KOPIA project constituted the study population.

3.4 Sampling and Sample Size

The 4 model villages were purposively selected for the survey and a list of the 400 participating farmers from the model villages was used to randomly select a sample of 150 farmers. In addition, 100 non-participating farmers were selected from the four model villages using simple random sampling technique to act as a control group.

3.5 Data Collection

The survey was carried out between September and October, 2022 and captured data for the latest production cycle. The data used for the study was cross-sectional obtained from household survey at farm level conducted by well-trained enumerators and administered through structured questionnaires.

Table 1

Description of Variables used for Impact Evaluation in Meru County

Variable	Type	Measurement
Income	Continuous	Kenya Shillings
Mbaria	Dummy	1 if farmer is located in Mbaria, 0 otherwise
Ng'onyi	Dummy	1 if farmer is located in Ng'onyi, 0 otherwise
Ntalami	Dummy	1 if farmer is located in Ntalami, 0 otherwise
Age	Continuous	Years
Experience	Continuous	Years
Off-farm income	Dummy	Yes=1, No=0
Occupation	Dummy	1 if farming is the main occupation, 0 otherwise
Cash crop enterprises	Continuous	Number
Livestock enterprises	Continuous	Number
Food crops enterprises	Continuous	Number
Eggs sold	Continuous	Number
Hens sold	Continuous	Number
Cocks sold	Continuous	Number
Eggs per hen	Continuous	Number

IV. FINDINGS & DISCUSSION

4.1 Response Rate

A 100% response rate was achieved by having 150 completed questionnaires that were collected from farmers who were participating in project activities. 86% response rate was achieved from the targeted 100 non-participating farmers.

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4.2 Characteristics of Participants and Non-Participants of KOPIA Project Activities

The differences in the characteristics of participants and non-participants with test of significance in their differences are presented in Table 2. T-tests were carried out for continuous variables and chi-square test for categorical variables.

Table 2

Differences in Characteristics of Participants and Non-Participants of KOPIA Project Activities (sample mean)

	Participating	Non-Participating	Difference	t/χ^2
Mbaria	0.23	0.31	-0.08	-1.35
Ngonyi	0.19	0.34	-0.15*	-2.63
Ntalami	0.33	0.07	0.3*	4.778
Age	50.01	44.74	5.27*	3.24
Experience (Years)	15.53	11.09	4.44*	3.26
Off-farm income (Yes=1)	0.75	0.81	-0.06	-1.07
Occupation (Farming=1)	0.63	0.7	-0.07	-1.06
Cash crop enterprises (No.)	0.23	0.23	0	0.01
Livestock enterprises (No.)	0.56	0.34	0.22*	2.62
Food crop enterprises (No.)	2.08	1.98	0.1	0.59
Eggs sold (No.)	197.6	194.49	3.11	0.05
Hens sold (No.)	17.17	6.93	10.24*	4.10
Cocks sold (No.)	14.68	7.7	6.98*	3.01
Eggs per hen (No.)	140.4	44.5	96.0*	3.01

*Significant at 10%, **significant at 5% and *** significant at 1%;

The t tests show that the participating and non-participating farmers differ significantly with respect to age, experience in poultry farming, number of livestock enterprises, number of hens and cocks sold and annual per hen egg production. Generally, participating farmers had more experience in poultry farming, had more livestock enterprises, sold more hens and cocks and higher per hen egg production. According to Chege *et al.* (2019), technology transfer aims to improve the human resources and production capacity for long-term economic development. Thus, the participating farmers reported a significantly number of eggs produced per hen, the number of cocks sold and the number of hens sold.

4.3 Impact of Participating in KOPIA Project on Income

To assess the impact propensity score matching (PSM) was applied. Since the purpose was to compare the outcomes for those participating and with those not participating, Aditiya et al (2019) suggest that the estimate can be constructed from a Probit or Logit model. The results of the initial step in PSM used in estimating the propensity scores (which employs a Logit regression) are shown in Table 3.

Table 3

Maximum Likelihood Estimates of the Logit Regression used in Estimating the Propensity Scores

Variable	Coef.	SE	z	P value
Mbaria	1.8514**	0.901	2.05	0.040
Ngonyi	1.7297*	0.974	1.78	0.076
Ntalami	4.1842***	1.002	4.18	0.000
Age	0.0234	0.029	0.8	0.426
Experience	0.0559	0.043	1.3	0.192
Off-farm income	-0.2676	0.789	-0.34	0.735
Occupation	-0.1447	0.606	-0.24	0.811
Cash crop enterprises	0.6235	0.640	0.97	0.330
Livestock enterprises	0.9910*	0.546	1.82	0.069
Food crops enterprises	-0.2519	0.331	-0.76	0.447
Eggs sold	-0.0017***	0.000	-2.6	0.009
Hens sold	0.1040*	0.053	1.95	0.051
Cocks sold	0.0058	0.044	0.13	0.894
Eggs per hen	0.0191***	0.006	3.05	0.002

*Significant at 10%, **significant at 5% and *** significant at 1%;

Pseudo R^2 = 0.388; P value = 0.000

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The likelihood ratio test of goodness of fit indicates that the model fits the data well (p value =0.000). The results also show that seven independent variables were found to be significant in explaining the farmers' participation in the KOPIA project. Hence individuals participating in the project differ significantly from the non-participants with respect to observable characteristics suggesting that there is self-selection. Comparing the two groups as they are would have resulted in biased estimates and thus the need to correct for selection bias through the use of propensity score matching.

With high production costs and as agricultural marketing becomes competitive in terms of quantity and quality, smallholder farmers increasingly encountered the problems regarding the production and distribution of agricultural products. The results show that livestock enterprises, egg production per hen, number of eggs sold and number of hens sold significantly influenced participation in the project. The results confirm the findings by Palee et al (2024) who reported that production income influenced the participation in agricultural projects. The findings confirm a study by Chege et al. (2019) which found that engaging in livestock enterprises influenced participation in agricultural technologies.

The impact of participating in the KOPIA project was computed using four matching algorithms namely, Kernel based matching (KBM), nearest neighbor matching 1 (NNM1), nearest neighbor matching 5 (NNM5) and Caliper based matching (KBM) as shown in Table 4. Nearest Neighbor 1 and 5 refers to matching algorithm that compares propensity score of a participant with the non-participant who has a similar or closest propensity score during impact assessment. It was preferred since all treated matches found a match. Kernel Matching was preferred to improve the quality of matching since it matched all the participants with a weighted average of all non-participants with weights that were inversely proportional to the distance between the propensity scores of the participants and non-participants. The main purpose of a matching procedure is to reduce selection bias by increasing the balance between the treatment and control groups. The outcome variable was the annual income from poultry in Kenya Shillings (Kshs).

Table 4
Impact of Participating in the KOPIA Program on Household Income

Matching algorithm	Outcome Variable	Treated	Controls	Difference	Std.Err	T-stat
Kernel Based Matching	ATT	116326.2	46418.09	69908.07	19507.01	3.58**
	ATU	23009.57	105771.90	82762.34		
Caliper Based Matching	ATT	115322.2	48705.42	66616.81	20180.09	3.3**
	ATU	22472.45	124771.40	102298.98		
Nearest neighbor Matching (1)	ATT	115322.2	48705.42	66616.81	20180.09	3.3**
	ATU	22472.45	124771.40	102298.98		
Nearest neighbor Matching (5)	ATT	115322.2	33647.47	81674.76	18981.61	4.3**
	ATU	22472.45	89011.08	66539.35		

*Significant at 10%, **significant at 5%, ***significant at 1%

Notes: ATT: Average Treatment effect of the Treated; ATU: Average Treatment effect of Untreated; ATE: Average Treatment Effect; Propensity Score: Refers to the probability that a household might be exposed to the treatment (Participation in KOPIA project).

The results indicate that, participating in KOPIA project had a positive and significant impact on the incomes of the small holder poultry farmers at the 5 percent level. The impact for these farmers is an increment in the average income from poultry of Kshs 69,908, Kshs 66,616, Kshs 66,616 and Kshs. 81,674 using KBM, CBM, NNM (1) and NNM (5) matching algorithms respectively which are significant at 5 percent. It can therefore be concluded that the impact of participating in KOPIA program helped the farmers to increase their income from poultry production. The 95% confidence level for all the matching methods imply that, assuming no selection bias, average annual income from poultry for participants was significantly higher than for the non-participants.

The density distribution of the propensity scores for participants and non-participants is shown in Figure 1. The bottom half of each graph shows the propensity score distribution for the non-treated, while the upper-half refers to the treated individuals. The y-axis (density/proportion) indicates the frequency of the propensity score distribution while the x-axis (propensity score) represents the estimated probability of a participant being in the treated group, based on their baseline characteristics, with scores ranging from 0 to 1. It presents the covariates' means, their t-test of differences in means as well as the percentage bias before and after matching.

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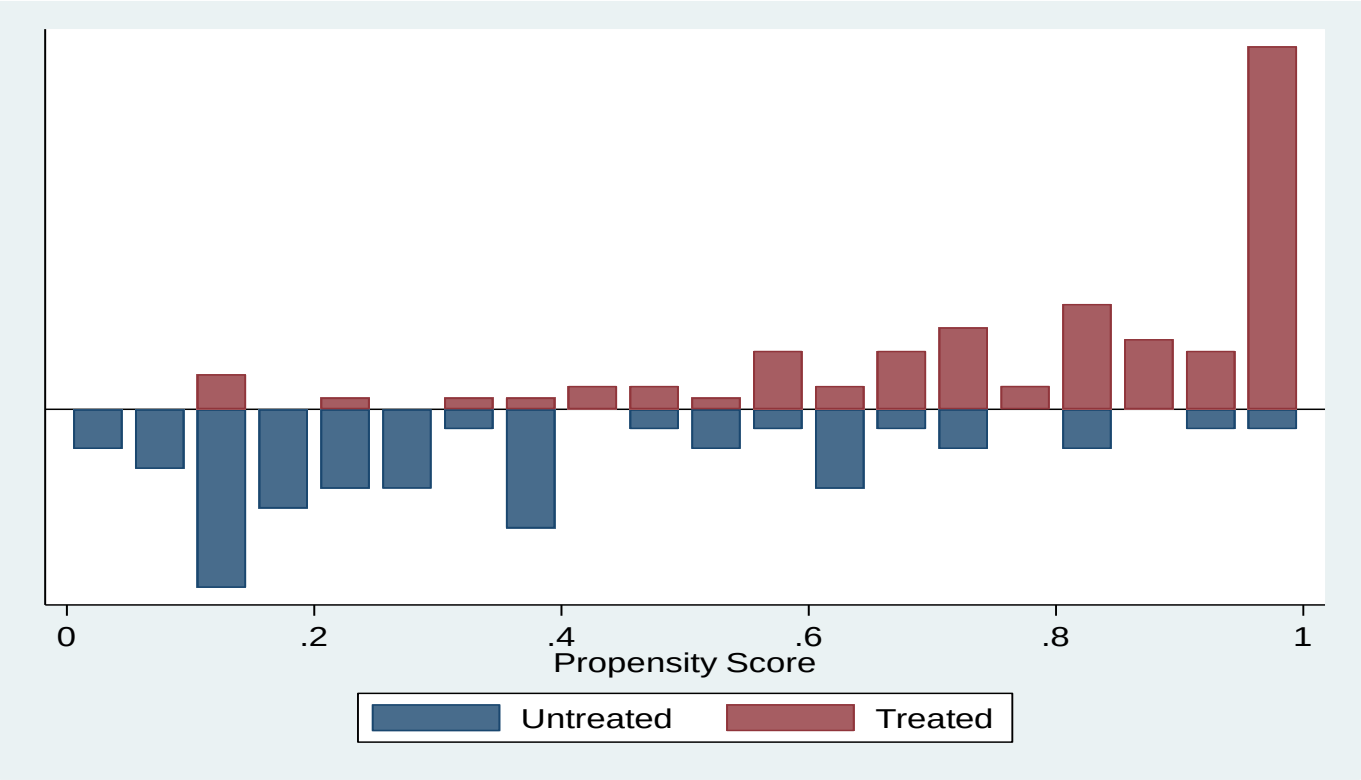

Figure 1
Propensity Score Distribution and Common Support for Propensity Score Estimation

Visual analysis of the density distribution of the propensity scores suggests that there is a high chance of getting good matches. All the treated and the untreated individuals were within the region of common support indicating that all treated individuals have corresponding untreated individuals. This indicates a successful propensity score model, allowing for a less biased estimation of the treatment or participation effect.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The main objective of this study was to determine the effect of participating in KOPIA project on income of small scale chicken farmers in Meru County. Using data from smallholder poultry farmers from participating villages in Meru County, Kenya, the study employed propensity score matching (PSM) to estimate the additional income that can be attributed to participation. Seven variables were found to be significant and include number of livestock enterprises, number of eggs per hen per year, the number of hens sold in a year, and residing in Mbaria, Ng'onyi, and Ntalami. The estimated average treatment effects (ATT) obtained through PSM method shows that participation yields positive and significant effects on the farmers' income. Given the findings, we point out that participating in KOPIA program is likely to improve farmers' income and therefore more farmers should be part the village model.

5.2 Recommendations

To enhance the impact of the KOPIA project and other agricultural development projects in the future, attention should be given to improving market access in order to increase benefits from increased output. For sustainability, assisting farmers to convert their groups to farmer cooperatives will not only enable them to get benefits of collective marketing, but also access credit for enterprise improvements and expansion. Farmer training should be on going in order to meet the continuous need for new knowledge, with emphasis on leadership and group dynamics.

REFERENCES

Abadi, T., Gezahegn, M., & Teklehaimanot, A. (2018). Assessment of factors affecting adoption of exotic chicken breed production in North Western Zone of Tigray, Ethiopia. *International Journal of Livestock Production, 9*(11), 293–299.

Acosta, A., Nicolli, F., & Karfakis, P. (2021). Coping with climate shocks: The complex role of livestock portfolios. *World Development, 146*, Article 105546. https://doi.org/10.1016/j.worlddev.2021.105546

Licensed Under Creative Commons Attribution (CC BY-NC)

Addison, M., Ohene-Yankyera, K., & Acheampong, P. P. (2022). The impact of uptake of selected agricultural technologies on rice farmers' income distribution in Ghana. *Agriculture & Food Security, 11*(2), 1–16. https://doi.org/10.1186/s40066-021-00339-0

Ali, A., & Abdulai, A. (2010). The adoption of genetically modified cotton and poverty reduction in Pakistan. *Journal of Agricultural Economics, 61*(1), 175–192.

Ayieko, M. O. D., Bett, E. K., & Kabuage, L. W. (2015). Analysis of indigenous chicken marketing participation decisions: The case of producers from Makueni County, Kenya. *East African Agricultural and Forestry Journal, 81*(1), 12–17.

Baker, J. (2000). *Evaluating the impact of development projects on poverty: A handbook for practitioners*. World Bank.

Barbara, S. (2009). Propensity score matching. Institute for Fiscal Studies, UCL. http://www.esrc.ac.uk

Brookes, G. (2022). Farm income and production impacts from the use of genetically modified (GM) crop technology 1996–2020. *GM Crops & Food, 13*(1), 171–195. https://doi.org/10.1080/21645698.2022.2105626

Chege, S. M., Wang, D., Leparan, S., & Kyetuza, O. (2019). Influence of technology transfer on performance and sustainability of standard gauge railway in developing countries. *Technology in Society, 56*, 79–92. https://doi.org/10.1016/j.techsoc.2018.09.007

County Government of Meru. (2018). *Meru County Integrated Development Plan, 2018–2022*. County Government of Meru.

Delgado, C. L., Mark, W. R., & Meyer, S. (2001). Livestock revolution to 2020: The revolution continues. Paper presented at the Annual Meeting of the International Agricultural Trade Research Consortium (ATRC), Auckland, New Zealand, January 18–19, 2001.

Dilley, L., Mausch, K., Crossland, M., & Harris, D. (2021). What's the story on agriculture? Using narratives to understand farming households' aspirations in Meru, Kenya. *The European Journal of Development Research, 33*, 1091–1114. https://doi.org/10.1057/s41287-021-00361-9

Government of Kenya. (2012). *National Agricultural Sector Extension Policy (NASEP)*. Government Printer.

Guèye, E. F. (1998). Village egg and fowl meat production in Africa. *World's Poultry Science Journal, 54*, 73–86. https://doi.org/10.1079/WPS19980007

Hailu, B. K., Abrha, B. K., & Weldegiorgis, K. A. (2014). Adoption and impact of agricultural technologies on farm income: Evidence from Southern Tigray, Northern Ethiopia. *International Journal of Food and Agricultural Economics, 2*(4), 91–106.

Heckman, J., Ichimura, H., Smith, J., & Todd, P. (1998). Characterizing selection bias using experimental data. *Econometrica, 66*(5), 1017–1098.

Hulme, D. (2000). Impact assessment methodologies for microfinance: Theory, experience and better practice. *World Development, 28*(1), 79–98.

Jaetzold, R., Schmidt, H., Hornet, Z. B., & Shisanya, C. A. (2007). *Farm management handbook of Kenya: Natural conditions and farm information* (Vol. 11/C, 2nd ed.). Ministry of Agriculture/GTZ.

Kamau, C. N., Kabuage, L. W., & Bett, E. K. (2018). Impact of improved indigenous chicken breeds on productivity: The case of smallholder farmers in Makueni and Kakamega counties, Kenya. *Cogent Food & Agriculture, 4*(1), Article 1477231.

Kamau, C. N., Kabuage, L. W., & Bett, E. K. (2019). Analysis of improved indigenous chicken adoption among smallholder farmers: Case of Makueni and Kakamega counties, Kenya. *International Journal of Agricultural Extension, 7*(1), 21–37. https://doi.org/10.33687/ijae.007.01.2809

KARI. (2011). *Kenya Agricultural Research Institute annual report*. KARI.

Kejela, Y., Banerjee, S., & Taye, M. (2019). Some internal and external egg quality characteristics of local and exotic chickens reared in Yirgalem and Hawassa towns, Ethiopia. *International Journal of Livestock Production, 10*(5), 135–142.

Kenya National Bureau of Statistics. (2021). *Economic survey 2021*. Kenya National Bureau of Statistics.

Khalil, C. A., Conforti, P., Ergin, I., & Gennari, P. (2017). Defining small-scale food producers to monitor Target 2.3. of the 2030 Agenda for Sustainable Development. Rome: FAO.

Kingori, A., Wachira, A., & Tuitoek, J. (2010). Indigenous chicken production in Kenya: A review. *International Journal of Poultry Science, 9*(4), 309–316. https://doi.org/10.3923/ijps.2010.309.316

Kirui, O. K., Okello, J. J., Nyikal, R. A., & Njiraini, G. W. (2013). Impact of mobile phone-based money transfer services in agriculture: Evidence from Kenya. *Quarterly Journal of International Agriculture, 52*(2), 141–162.

Kono, H., & Takahashi, K. (2010). Microfinance revolution: Its effects, innovations, and challenges. *The Developing Economies, 48*(1), 15–73.

Mensah, A., Asiamah, M., Wongnaa, C. A., Adams, F., Etuah, S., Gaveh, E., & Appiah, P. (2021). Adoption impact of maize seed technology on farm profitability: Evidence from Ghana. *Journal of Agribusiness in Developing and Emerging Economies, 11*(5), 578–598.

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Meru County Government. (2019). *Meru Vision 2040: A prosperous, united and happy society*. County Government of Meru.

Milkias, M., Molla, M., & Tilahun, S. (2019). Productive and reproductive performance of indigenous chickens in Gena Bossa District of Dawro Zone, Ethiopia. *International Journal of Livestock Production, 10*(1), 24–32.

Ministry of Agriculture, Livestock and Fisheries. (2018). *Economic review of agriculture*. Government Printers.

Ministry of Agriculture, Livestock and Fisheries. (2019). *Agricultural census*. https://statistics.kilimo.go.ke/en/2_3c/

Mottet, A., & Tempio, G. (2017). Global poultry production: Current state and future outlook and challenges. *World's Poultry Science Journal, 73*(2), 245–256. https://doi.org/10.1017/S0043933917000071

Mwendia, S., Ohmstedt, U., Peters, M., & Notenbaert, A. (2020). Livestock feeds assessment report from Meru County, Kenya. International Center for Tropical Agriculture.

Mwiti, M. E., Njiri, N. S., & Chege, M. S. (2021). Production of indigenous poultry among smallholder farmers in Tigania West, Meru County, Kenya. *African Journal of Agricultural Research, 17*(5), 705–713. https://doi.org/10.5897/AJAR2021.15465

Neumann, J., & Morgenstern, O. (2007). *Theory of games and economic behavior: 60th anniversary commemorative edition*. Princeton University Press.

Palee, W., Sirisunyaluck, R., Chalermphol, J., & Limnirankul, B. (2024). Factors affecting farmer's participation on agricultural extension of the longan collaborative farming project in Lamphun Province, Thailand. *International Journal of Agricultural Technology, 20*(3), 1165–1176.

Republic of Kenya. (2013). *Meru County Integrated Development Plan 2013–2017*. Government Printers.

Rosenbaum, P., & Rubin, D. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*, 41–55.

Samuel, J., Rao, C. A. R., Raju, B. M. K., Reddy, A. A., Pushpanjali, Reddy, A. G. K., Kumar, R. N., Osman, M., Singh, V. K., & Prasad, J. V. N. S. (2022). Assessing the impact of climate resilient technologies in minimizing drought impacts on farm incomes in drylands. *Sustainability, 14*, 382. https://doi.org/10.3390/su14010382

Streatfield, D., & Markless, S. (2009). What is impact assessment and why is it important? *Performance Measurement and Metrics, 10*(2), 134–141. https://doi.org/10.1108/14678040911005473

Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science, 25*(1), 1–21. https://doi.org/10.1214/09-STS313

Tadelle, D., Alemu, Y., & Peters, K. J. (2000). Indigenous chicken in Ethiopia: Genetic potential and attempts at improvement. *World's Poultry Science Journal, 56*, 45–54.

White, H. (2006). Impact evaluation: The experience of the Independent Evaluation Group of the World Bank. The World Bank. https://mpra.ub.uni-muenchen.de/1111/

Wiebe, K., Sulser, T. B., Dunston, S., Rosegrant, M. W., Fuglie, K., & Willenbockel, D. (2021). Modeling impacts of faster productivity growth to inform the CGIAR initiative on crops to end hunger. *PLoS ONE, 16*(4), e0249994. https://doi.org/10.1371/journal.pone.0249994

World Bank. (2008). *The growth report: Strategies for sustained growth and inclusive development*. The World Bank.

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Influence of the collaborative roles of human resource and line managers on organizational performance: A systematic review

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ABSTRACT

The collaborative roles of Human Resource (HR) practitioners and line managers have garnered significant attention in management research, particularly for their potential to enhance organizational performance. Despite this interest, there is a lack of systematic investigation into how HR-line manager collaboration specifically influences organizational outcomes. This study explored the nature of HR-line manager collaboration and assessed its impact on organizational performance. Using a systematic review of scholarly articles published between 2018 and 2025 (following [Preferred Reporting Items for Systematic Reviews and Meta-Analyses] PRISMA protocols) from reputable databases, combined with semi-structured interviews conducted with 15 key informants from various Ministries, Departments, and Agencies (MDAs), the study provides comprehensive insights. The findings indicate that strong HR-line manager collaboration is positively linked to improved employee engagement, productivity, and retention. Qualitative analysis identifies significant challenges such as role ambiguity, inadequate training, and a deficiency of empathy among HR personnel. Conversely, effective collaboration is facilitated by clearly delineated roles and focused capacity-building initiatives. The study contributes practical recommendations for HR practitioners and policymakers by highlighting strategies to overcome collaboration barriers and optimize HR-line manager partnerships, ultimately promoting sustainable organizational success.

Keywords: HR-Line Manager Collaboration, Human Resource, Organizational Performance

I. INTRODUCTION

Effective collaboration between Human Resource (HR) professionals and line managers is a critical factor in enhancing organizational performance (Bayo-Moriones & Bello-Pindado, 2021). HR departments are responsible for designing policies related to recruitment, training, performance management, and employee relations, while line managers play a key role in implementing these policies at the operational level (Beijer et al., 2019). The synergy between these two roles ensures that human capital is effectively managed to align with organizational goals. However, in many organizations, the collaboration between HR and line managers is inconsistent, poorly structured, or hindered by bureaucratic challenges, leading to inefficiencies in workforce management and overall performance outcomes (Kurdi-Nakra & Pak, 2023).

The strategic integration of HR and line managers has been widely acknowledged in Strategic Human Resource Management (SHRM) literature as a key driver of employee engagement, productivity, and retention (Lundmark et al., 2020a). Line managers serve as the first point of contact for employees, making them crucial in translating HR policies into daily operations. When HR and line managers work collaboratively, they create a work environment that fosters innovation, motivation, and high performance. Conversely, a lack of collaboration often results in miscommunication, inconsistent policy implementation, and reduced workforce effectiveness (Beijer et al., 2019). This raises concerns about how organizations can establish strong collaboration frameworks to optimize performance.

Despite the significance of HR-line manager collaboration, several challenges persist. Many line managers feel that HR policies are developed without sufficient input from those on the ground, leading to rigid and impractical workforce management approaches (Lundmark et al., 2020b; Ruël & Gbur, 2017). Moreover, HR professionals often report that line manager's lack adequate HR training, making it difficult for them to effectively implement policies such as performance evaluations, employee engagement programs, and talent management strategies. Furthermore,

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organizational structures and cultural barriers can create silos between HR and line management, limiting cooperation and hindering strategic workforce planning (Crawshaw & Game, 2015). These issues necessitate further research on how HR and line managers can better collaborate to drive organizational performance.

Empirical studies suggest that organizations that prioritize HR-line manager collaboration benefit from higher employee satisfaction, lower turnover rates, and increased operational efficiency (Bondarouk et al., 2019; Katou et al., 2021; Kehoe & Han, 2020; Rimi et al., 2017). Successful companies invest in joint leadership training programs, HR analytics tools, and digital HR systems to enhance collaboration. However, the effectiveness of these interventions varies across different organizational contexts, requiring a more in-depth analysis of best practices, success factors, and challenges. Understanding the specific mechanisms through which HR and line managers contribute to performance improvement is essential for designing effective collaboration models that can be adapted to different industries and sectors.

Given the importance and challenges associated with HR-line manager collaboration, this study seeks to conduct a systematic review of existing literature and supplement it with qualitative insights from key informants to provide a comprehensive understanding of the impact of collaborative roles between HR-Line managers on organizational performance. By integrating secondary data with real-world experiences from line, this study aims to identify collaborative strategies, key influencing factors, and barriers that shape HR-line manager dynamics. The findings will provide practical recommendations for policymakers, HR practitioners, and organizational leaders looking to enhance workforce performance through improved collaboration frameworks.

In today's dynamic business environment, effective collaboration between HR professionals and line managers is essential for achieving optimal workforce performance and organizational success (Kehoe & Han, 2020). HR departments are responsible for developing policies, managing talent, and ensuring compliance with labor laws, while line managers serve as the direct link between employees and organizational leadership. Despite growing recognition of the strategic role of HR and line manager collaboration, there is limited systematic investigative evidence on how this collaboration directly affects organizational performance in different institutional contexts. Most existing studies focus on general HRM strategies, but few explore the specific collaborative mechanisms, success factors, and challenges that influence the effectiveness of HR-line manager interactions (Bondarouk et al., 2019; Katou et al., 2021; Kehoe & Han, 2020; Rimi et al., 2017). This gap in research makes it difficult for organizations to design structured, evidence-based collaboration frameworks that can optimize performance outcomes.

To address this issue, a systematic review of existing literature combined with qualitative insights from key informant interviews were conducted to examine how HR-line manager collaboration impacts organizational performance. The study will explore collaborative strategies, key performance indicators, facilitating factors, and barriers that shape this dynamic. Specifically, the study addressed the following objectives:

i. To explore the nature and scope of collaboration between HR and line managers and its impact on organizational performance.
ii. To identify the factors that facilitates or hinders effective collaboration between HR and line managers.
iii. To assess the outcomes of HR and line manager collaboration on employee outcomes, including engagement, retention, and performance.
iv. To provide evidence-based recommendations for improving HR-line manager collaboration to enhance organizational performance.

II. LITERATURE REVIEW

2.1 Theoretical Review

The collaboration between HR professionals and line managers in influencing organizational performance can be understood through several theoretical frameworks. This section reviews relevant theories that explain the roles, interactions, and impact of HR and line managers on workforce management and overall business success.

2.1.1 Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, developed by Barney (1991), emphasizes that an organization's sustainable competitive advantage is derived from its ability to manage and leverage valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 2001). Among these, human capital the knowledge, skills, and competencies of employees stand out as a crucial asset in determining an organization's long-term success. Organizations that effectively harness their human resources gain a strategic edge, as employees drive productivity, innovation, and operational efficiency. However, this requires strong collaboration between HR professionals, who develop and oversee human capital strategies, and line managers, who implement these strategies at the operational level. Without effective collaboration, the full potential of human capital remains untapped, limiting an organization's ability to achieve superior performance (Assensoh-Kodua, 2019).

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This study applies RBV theory to examine the extent to which HR and line managers collaborate in optimizing human capital to enhance organizational performance. HR professionals are responsible for developing policies related to recruitment, training, career progression, and employee engagement, while line managers serve as the link between HR strategies and workforce execution. When HR and line managers work in harmony, they ensure that organizational goals align with workforce capabilities, leading to improved employee performance, retention, and productivity. However, challenges such as communication gaps, role conflicts, and inadequate managerial training often hinder effective collaboration, resulting in poor policy implementation and reduced workforce efficiency. By analyzing the collaborative mechanisms, barriers, and key drivers of success, this study provides insights into how organizations can enhance HR-line manager cooperation to maximize human capital utilization and, ultimately, improve organizational performance.

Building on the Resource –based view, this review highlight that effective collaboration between HR and line managers acts as a strategic resource that enhances human capital utilization, similarly, Role theory explains how role clarity and shared responsibilities facilitate or hinder this collaboration, impacting organizational outcomes. Our synthesis reveals that addressing role ambiguity and fostering HR-line manager partnership are crucial for leveraging these theoretical advantages.

2.1.2 Role Theory

Role Theory, introduced by Katz and Kahn in 1978, explains how individuals within organizations perform specific roles based on structured expectations, responsibilities, and interactions (Collins & Stockton, 2018). In the context of human resource management, HR professionals and line managers have distinct but interdependent roles that require seamless collaboration to ensure effective workforce management. HR professionals are primarily responsible for designing and implementing policies related to talent acquisition, training, employee well-being, and compliance with labor regulations (Biddle, 1986). In contrast, line managers act as the first point of contact between employees and the organization, overseeing day-to-day performance management, employee motivation, and direct application of HR policies. The effectiveness of HR-line manager collaboration depends on role clarity, mutual understanding, and open communication, ensuring that both parties fulfill their responsibilities without conflicts or inefficiencies.

This study applies Role Theory to assess the impact of role clarity and collaboration on organizational performance. When HR and line managers have well-defined responsibilities and engage in proactive communication, HR policies are effectively translated into practical actions that drive employee productivity, engagement, and retention (Galletta & Heckman, 1990). However, in many organizations, role ambiguity and lack of alignment create challenges such as delayed decision-making, inconsistent policy implementation, and ineffective employee management. Some line managers may feel overburdened with HR responsibilities, while HR professionals may struggle to enforce policies without managerial support, leading to a disconnection that negatively affects organizational performance. By identifying the factors that enhance or hinder role-based collaboration, this study provides practical recommendations on how organizations can foster a stronger and more effective partnership between HR and line managers to drive business success.

2.2 Empirical Review

Empirical studies grounded in Role Theory show that the collaborative relationship between HR and line managers significantly influences organizational performance through role clarity, role alignment, and shared responsibilities. Research consistently indicates that when HR and line managers have clearly defined roles particularly in the areas of recruitment, performance management, training, and employee relations organizations experience stronger implementation of HR practices, improved decision-making, and enhanced workforce productivity (Biddle, 1986). Conversely, empirical evidence shows that role ambiguity and role conflict hinder collaboration, resulting in inconsistent policy implementation, lower employee engagement, and reduced organizational effectiveness.

Studies further highlight that complementary roles, where HR focuses on strategic activities and line managers handle daily people management, lead to better employee development outcomes, higher performance levels, and stronger organizational alignment. Effective communication and HR-related training for line managers are also found to reduce role strain and increase competence, thereby strengthening collaboration (Anvari *et al.*, 2024). However, empirical evidence shows that role overload among line managers and limited authority among HR professionals can weaken role execution and impede performance. Overall, empirical findings support that organizations with well-defined, complementary, and collaboratively enacted HR and line manager roles achieve higher productivity, better employee outcomes, and more successful strategic HRM implementation.

Empirical evidence also shows that role ambiguity is one of the most persistent barriers to collaborative HR–line manager performance. Studies have found that when line managers do not fully understand their HR duties, or when HR departments fail to communicate policies effectively, employees receive a mixed signal, which affects

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performance outcomes and reduces trust in leadership (Pombo & Gomes, 2022). Such ambiguity often leads to inconsistencies in how HR practices are applied across departments, undermining organizational fairness and diminishing the strategic value of HRM systems. Role Theory explains this dynamic by emphasizing how unclear expectations produce psychological strain, decision-making confusion, and reduced task efficiency (Biddle, 1986).

Role conflict is another factor empirically shown to affect the HR–line manager partnership. Research reveals that line managers frequently experience conflict between their operational roles such as meeting production targets and HR roles that require coaching or addressing employee relations issues (Dany et al., 2022). These conflicting demands create tension that reduces the quality of HR practice implementation, such as inconsistent performance appraisals or inadequate feedback. Organizations with high role conflict tend to experience lower employee morale, weaker service delivery, and diminished organizational performance (Engelsberger et al., 2023). Role Theory supports these findings by suggesting that incompatible role expectations lead to emotional strain and performance deterioration.

Empirical research further indicates that when HR and line managers recognize how their roles complement each other, organizational outcomes improve significantly. Studies in various sectors show that when HR focuses on strategy formulation and workforce planning while line managers handle day-to-day employee interactions, employees experience better support and clearer communication (Kim et al., 2018). Such complementary role alignment increases trust, reduces workplace conflict, and enhances the overall quality of HR practices. Research also suggests that shared ownership of HR responsibilities increases commitment from both parties, leading to more effective implementation of HR systems and improved employee outcomes such as job satisfaction and engagement (Dulal-Arthur *et al.*, 2024).

However, empirical studies also emphasize systemic challenges, particularly role overload among line managers and limited authority for HR departments. Line managers often report that HR responsibilities add to their already demanding workloads, creating time pressure and reducing the attention they can devote to people management (Chimakati & Odiyo, 2023). This overload leads to shortcuts in HR implementation, affecting the quality of performance reviews, employee development initiatives, and conflict resolution. On the other hand, some studies show that HR professionals sometimes lack sufficient authority to enforce policies, leading to inconsistent implementation across departments. These findings align with Role Theory's view that unclear authority structures contribute to confusion and weakened role performance.

Overall, empirical evidence strongly supports that effective collaboration between HR and line managers driven by role clarity, role complementarity, and an aligned expectation significantly enhances organizational performance. Organizations that successfully manage role ambiguity, reduce role conflict, and address role overload experience higher productivity, better employee outcomes, and more effective HR strategy execution (Anvari et al., 2024). The combined findings suggest that Role Theory provides a robust framework for understanding how collaborative roles influence organizational performance, emphasizing the importance of structured communication, well-defined responsibilities, and supportive organizational systems.

III. METHODOLOGY

3.1 Research Approach

This systematic review adopts a mixed-method approach, utilizing secondary data analysis and qualitative data from key informant interviews (KIs). The study focuses on the collaborative roles of HR professionals and line managers in influencing organizational performance, with data sourced from both existing literature and first-hand insights from key industry professionals (De Oliveira, 2023). This section outlines the research design, data sources, sampling techniques, and data analysis methods.

3.2 Research Design

The study employs a systematic review design, synthesizing existing scholarly articles, reports, and case studies on HR-line manager collaboration (Creswell & Poth, 2018). This is supplemented by qualitative data collected through semi-structured interviews with line managers from executive agencies, independent departments, ministries, and institutions. The combination of secondary data and primary qualitative insights enhances the study's comprehensiveness, credibility, and practical relevance.

3.3 Data Sources and Selection Criteria

The secondary data consists of peer-reviewed journal articles, industry reports, and organizational studies published between 2018 and 2025. These sources were retrieved from reputable databases such as Google Scholar, PubMed, Scopus, and Web of Science. The selection criteria focused on studies that:

Examine the collaboration between HR and line managers in different organizational settings. Explore the impact of HR-line manager collaboration on key performance indicators such as employee productivity, retention, and organizational efficiency. Identify factors influencing effective collaboration, including organizational culture,

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leadership styles, and resource availability. Highlight the challenges hindering HR-line manager collaboration and possible solutions. For the primary data, semi-structured interviews were conducted with 15 key informants from ministries, independent departments, and executive agencies. These participants were selected based on their experience and their availability and redness to participate in the study, their roles in HR management, leadership roles, and direct involvement in employee performance oversight was an important factor for inclusion.

3.4 Sampling Technique

A purposive sampling technique was used to select the 15 key informants for interviews. This non-probabilistic sampling method ensures that only individuals with substantial knowledge and experience in HR-line manager collaboration are included in the study (Thomas, 2022). The selection process prioritized diversity in organizational settings, capturing insights from diverse public institutions to provide a broader perspective on the subject.

3.5 Data Collection Methods

This study employs a systematic literature review for secondary data collection and semi-structured interviews for primary data collection. For secondary data collection, a systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Selçuk, 2019). The PRISMA framework ensures that the review process is rigorous, transparent, and replicable, minimizing biases in the selection and synthesis of sources. The study identified and analyzed peer-reviewed journal articles, reports, and case studies from reputable databases such as Google Scholar, Scopus, Web of Science, and PubMed. The inclusion criteria focused on studies published between 2018 and 2025 that examine HR-line manager collaboration, its impact on key performance indicators, and the factors facilitating or hindering this collaboration. The data extraction process involved reviewing abstracts, selecting relevant full-text articles, and synthesizing findings into thematic categories aligned with the study's objectives.

For primary data collection, semi-structured interviews were conducted with 15 key informants drawn from executive agencies, independent departments, ministries, and institutions. These interviews were conducted either in-person or virtually, depending on the availability and preference of participants. The semi-structured format allowed for flexibility in exploring participants' perspectives while ensuring consistency in addressing key topics related to collaborative strategies, challenges, and performance outcomes. The interviews focused on how HR professionals and line managers interact the effectiveness of their collaboration, and the impact of their joint efforts on employee engagement, productivity, and overall organizational efficiency. While the qualitative sample provided valuable insights, it is limited in scope; future research could expand this to include a large and more diverse sample to enhance generalizability. Additionally, triangulating interview data with organizational performance metrics would strengthen causal inferences.

3.6 Data Analysis

The study employed a thematic analysis approach to interpret and synthesize findings from both secondary and primary data sources. Thematic analysis was used to identify, analyze, and report patterns (themes) within the data, allowing for a comprehensive examination of the collaborative roles of HR professionals and line managers in influencing organizational performance (Ali & Bhaskar, 2016). The structured nature of thematic analysis ensured that key insights were captured, categorized, and interpreted in a meaningful way. The first step in the analysis process was familiarization with the data, where the researcher thoroughly reviewed literature, interview transcripts, and notes to identify recurring patterns and insights related to HR-line manager collaboration. This stage provided a deep understanding of the context and perspectives presented in both secondary and primary data sources. The next step involved generating initial codes, where data was broken down into smaller units of meaning and assigned specific codes based on their relevance to HR-line manager collaboration. These codes included aspects such as communication effectiveness, policy implementation, leadership involvement, and employee performance impact.

Once the initial codes were established, they were grouped into broader themes that aligned with the study's objectives. The themes identified in this study included collaborative strategies, key performance indicators, facilitating factors, and challenges hindering HR-line manager collaboration. These themes helped structure the discussion of findings and draw meaningful conclusions. Finally, the study interpreted and synthesized findings by comparing themes across secondary and primary data sources. This comparative analysis provided a comprehensive understanding of the extent to which HR and line managers collaborated, the factors that facilitated or hindered this collaboration, and its overall impact on employee and organizational outcomes.

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IV. FINDINGS & DISCUSSION

4.1 Findings

The empirical studies reviewed reveal a comprehensive view of the critical role that line managers play in HRM and its subsequent impact on organizational performance. These studies consistently emphasize that line managers are not just administrative figures; they are central to the implementation of HR practices and the day-to-day management of employees. Their involvement significantly influences various organizational outcomes, including employee engagement, job satisfaction, retention, and overall business performance.

Table 1

Thematic Analysis Result

Theme	Studies	Key Findings/Focus
Role of Line Managers in HRM and Organizational Performance	Kehoe & Han (2020), Kim *el al.* (2018), Katou *el al.* (2021), Pombo & Gomes (2022), Anvari *et al.* (2024)	Line managers play a pivotal role in implementing HR practices and fostering employee engagement, job satisfaction, and organizational performance. Effective communication and collaboration with HR specialists and their leadership quality are key factors in improving employee performance and reducing turnover.
HR-Line Manager Collaboration	Rimi *el al.* (2017), Chimakati & Odiyo (2023), Beijer *el al.* (2019), Bondarouk *el al.* (2019)	Strong collaboration between HR specialists and line managers is critical for aligning HRM practices with organizational goals. It fosters innovation, improves employee satisfaction, and enhances the effectiveness of policy implementation.
Devolution of HRM Responsibilities	Rimi *el al.* (2017), Dany *el al.* (2022), Pombo & Gomes (2022)	Devolution of HRM responsibilities to line managers enhances HRM effectiveness by involving them in decision-making and aligning HRM practices with operational needs. When line managers take on more HR duties, they better understand employee needs, driving engagement and performance improvements.
HRM Innovation and Open Innovation	Engelsberger *et al.* (2022), Bondarouk *el al.* (2019)	Line managers' involvement in HRM is critical to fostering open innovation by supporting knowledge sharing and motivating employees. HRM practices such as leadership development and feedback systems are central to encouraging innovative behavior and creative problem-solving among employees.
Impact of HRM on Employee Well-being	Dulal-Arthur *et al.* (2024), Beijer *el al.* (2019)	Training and support for line managers in employee well-being (mental health and engagement) significantly enhance workplace conditions. Collaboration between HR and line managers in implementing mental health initiatives is a key driver for improving employee well-being and reducing burnout.
HRM Integration and Strategic Alignment	Dany *el al.* (2022), Katou *el al.* (2021)	Effective integration of HRM practices within the organizational strategy requires a balance of influence between HR specialists and line managers. Strategic alignment enhances organizational performance, with shared responsibility for HRM initiatives leading to better outcomes for both the employees and the organization as a whole.

4.1.1 The Role of Line Managers in HRM and Organizational Performance

Numerous studies underscore the crucial role line managers play in implementing HR practices and driving organizational success (Anvari et al., 2024; Katou et al., 2021; Kehoe & Han, 2020; Kim et al., 2018; Pombo & Gomes, 2022). These managers are seen as key enablers of employee performance through their ability to foster positive working relationships, provide timely feedback, and communicate HR initiatives effectively. Research indicates that line managers are critical to ensuring that HR policies align with the needs and goals of the workforce, and when these practices are implemented effectively, they lead to improved employee outcomes.

One interviewee, Interviewee A, shared:

> *"As a line manager, my role goes beyond overseeing day-to-day tasks. I have a responsibility to ensure that our team fully understands HR policies, and I play an active role in guiding them through performance reviews, coaching, and giving feedback".* (KI, HRM, December, 2024).

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This quote reflects the belief that line managers don't just enforce HR practices, but are integral to the actual implementation and success of these strategies. Another participant, Interviewee B, echoed this sentiment:

> *"When line managers take a hands-on approach to HR practices like giving feedback and addressing team concerns, employees feel valued and supported. They are more likely to remain engaged with their work. This is something I see firsthand; it creates an atmosphere of trust, and trust leads to better performance. The HR strategies are more effective when they are practiced by someone who interacts with employees daily".* (KI, HRM, December, 2024).

This proves that, line managers are instrumental in shaping the organizational climate, enhancing employee job satisfaction, and ultimately improving organizational performance. Their day-to-day interactions with staff give them the unique ability to gauge employee concerns and work toward addressing them, making them essential players in reducing turnover rates and fostering a positive work environment.

4.1.2 HR-Line Manager Collaboration

Another common theme in the studies is the importance of collaboration between line managers and HR specialists. The research by (Beijer et al., 2019; Bondarouk et al., 2019; Chimakati & Odiyo, 2023; Rimi et al., 2017) all emphasize that a strong relationship between these two groups is critical to ensuring that HR practices are not only designed but also effectively executed within the organization. The studies highlights that line managers often bridge the gap between HR strategy and the workforce, ensuring that HR policies are relevant to the practical realities of employees. When HR specialists and line managers work together in a cohesive manner, the result is a more flexible, responsive, and engaged workforce. This collaboration is also linked to greater levels of innovation within organizations, as line managers who understand HR practices can better encourage creativity and problem-solving among employees. The studies show that when line managers are well-trained in HR policies and work closely with HR professionals, they become more effective in managing team dynamics, handling conflicts, and motivating employees, leading to improved organizational outcomes such as enhanced productivity and morale.

While most studies emphasize the positive effects of collaboration, the results from interviewee highlight persistent challenges such as role conflict and training gaps. This suggests that merely promoting collaboration is insufficient; organizations must also invest in role clarification and capacity building to realize the full benefit.

4.1.3 Devolution of HRM Responsibilities to Line Managers

The devolution of HRM responsibilities to line managers is another prominent theme discussed in the literature. According to Rimi *et al.* (2017), (Dany et al., 2022) and Pombo & Gomes (2022), giving line managers more responsibility in managing HR practices like recruitment, performance evaluations, and training is critical for enhancing HRM effectiveness. These studies suggest that when line managers take on HR-related tasks, they gain a deeper understanding of their team members' needs and aspirations. As a result, they can tailor HR interventions that are more relevant and effective, thereby improving employee performance and engagement. This approach enables organizations to respond more swiftly to changing workforce needs and operational demands. The research highlights that line managers, when empowered with HR responsibilities, are more likely to feel ownership over HR processes, leading to greater accountability and a more personalized approach to employee development. Interviewee C shared:

> *"Taking on responsibility for recruitment and performance reviews has made me much more involved in my team's development. Before, HR was the separate entity that gave us policies, but now I'm part of the decision-making process. It's no longer something that's 'done to' my team—it's something we do together. That sense of ownership is powerful for both me and the team."* (KI, HRM, January, 2025).

Interviewee D added to this, saying,

> *"When line managers are given the autonomy to manage their team's HR needs, it becomes much more personal. I have a clearer understanding of my team's strengths, weaknesses, and potentials, which allows me to make more informed decisions about development and performance. The accountability that comes with this responsibility drives me to be more involved in making sure that the HR processes are aligned with the team's needs."* (KI, HRM, January, 2025).

Interestingly studies indicate that devolution of HR responsibilities enhance engagement, but some managers from interview report feeling overwhelmed without adequate training. This contradiction underscores the importance of supporting line managers through targeted capacity development.

4.1.4 HRM Innovation and Open Innovation

Several studies also explore the link between HRM practices and innovation, particularly the role line manager's play in fostering open innovation within organizations. (Engelsberger et al., 2023) and (Bondarouk et al., 2019) argue that line managers are essential to creating an organizational culture that encourages open communication and knowledge sharing. By fostering an open and inclusive work environment, line managers can inspire employees to

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contribute innovative ideas that drive organizational growth. The studies indicate that line managers who actively promote a culture of creativity and knowledge exchange can harness the full potential of their teams, leading to competitive advantages for the organization. By encouraging collaboration and flexibility, line managers help develop an atmosphere conducive to open innovation, where employees feel valued and are motivated to share their ideas freely. Interviewee I shared:

> *"Innovation doesn't just happen by chance. I encourage my team to think outside the box and to regularly come up with new ideas, whether it's for improving processes or developing new products. I facilitate brainstorming sessions and make sure that every voice is heard. When employees feel supported in their creativity, they become more invested in the success of the organization."* (KI, HRM, January, 2025).

Also interviewee J reinforced this point:

> *"As a line manager, it's essential that I foster a culture where innovation is welcomed. I always tell my team that there's no such thing as a 'bad idea.' I want them to feel comfortable suggesting solutions to problems or proposing new ways of doing things. That openness builds a sense of trust and allows the team to be more creative and forward-thinking."* (KI, HRM, January, 2025).

4.1.5 Impact of HRM on Employee Well-being

Another critical aspect highlighted by the studies is the role of line managers in supporting employee well-being. Research by (Dulal-Arthur et al., 2024) and (Beijer et al., 2019). Beijer *et al.* (2019) emphasizes that line managers are vital to implementing HR practices aimed at improving employee mental health, engagement, and work-life balance. These managers, when properly trained, can identify signs of burnout and stress among employees and take appropriate actions to mitigate these issues. The studies underscore the positive impact of well-being initiatives on employee satisfaction, morale, and organizational loyalty. Furthermore, it is noted that HR departments that collaborate closely with line managers to promote well-being initiatives can create a healthier work environment, which in turn reduces absenteeism, turnover, and workplace stress. Interviewee K shared:

> *"I've learned over time that employee well-being is about more than just physical health; it's about emotional support as well. I make sure I check in with my team regularly, not just about their work, but about how they're feeling. If I notice someone is stressed, I'll offer them flexible hours or just listen to what they have to say. These small actions can prevent burnout and help employees perform at their best."* (KI, HRM, December, 2024).

These practices are particularly important in industries where employee well-being is at risk, such as high-pressure environments or those dealing with vulnerable populations.

4.1.6 HRM Integration and Strategic Alignment

Finally, the studies reviewed by Dany *et al.* (2022) and Katou *et al.* (2021) show that aligning HRM practices with organizational strategy is crucial for improving business outcomes. When HRM strategies are integrated with the broader goals of the organization, it enables both HR professionals and line managers to work towards common objectives, ensuring that HR practices are aligned with the needs of the business. The research shows that this strategic alignment results in more effective HR interventions and better business performance. Line managers, with their day-to-day understanding of operations, are in a unique position to facilitate this integration by ensuring that HR policies are applied in a way that is consistent with the organization's strategic goals. This alignment is considered key to enhancing employee engagement, satisfaction, and organizational effectiveness. Interviewee M explained:

> *"For HR practices to be effective, they need to align with the overall business strategy. As a line manager, I make sure my team understands how their day-to-day activities contribute to the bigger picture. It's not just about following rules; it's about working towards common organizational objectives* (KI, HRM, December, 2024).

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

This study has examined the pivotal role of line managers in the implementation and success of Human Resource Management (HRM) practices within organizations. The research shows that line managers are essential not just in executing HR policies but also in shaping the overall organizational climate and influencing employee performance. Their involvement in the day-to-day application of HR practices significantly impacts employee motivation, job satisfaction, and retention, which are critical factors for organizational success. The study also highlights that line managers bridge the gap between HR strategies and the workforce, ensuring that HR policies are not only communicated but also effectively integrated into operational practices.

One of the primary findings is that line managers are integral in creating a positive work environment. Their leadership style, interactions with employees and ability to foster a supportive team culture directly affect employee

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engagement and performance outcomes. By empowering line managers with more HR responsibilities, organizations can increase their engagement and sense of ownership, which in turn enhances the overall effectiveness of HR practices.

5.2 Recommendations

Based on the findings of this study, organizations should make investments in continuous training and development programs for line managers in order to reinforce the effectiveness of HRM practices. Training should focus on performance management, leadership, conflict resolution, and employee engagement, among other areas, to improve the capacity of line managers to implement the HR policies competently and consistently. Organizations should also promote closer collaboration between the HR department and line managers through the setup of formal and clear channels of communication. They should institutionalize regular consultative meetings, joint planning sessions, and structured mechanisms that allow feedback to ensure that HR policies are well integrated into daily line management practices and continue to be responsive to employees' needs.

The study further suggests that organizations should give more responsibility to the line managers in respect of core HR functions like recruitment, training, and performance management. Such involvement is likely to foster a greater sense of ownership, accountability, and commitment on their part for ensuring that the HR practices are effectively implemented. Second, HR policies and practices must be integrated with general organizational strategy to establish coherence between workforce management and strategic objectives. Therefore, the line managers should actively participate in the strategy formulation process so that HR interventions reflect operational realities and are tailored according to the specific needs of their teams.

REFERENCES

Ali, Z., & Bhaskar, J. B. (2016). Basic statistical tools in research and data analysis. *Indian Journal of Anaesthesia, 60*(10), 790.

Anvari, R., Janjaria, M., & Shirvani, A. (2024). Role of line managers in human resource activities: Evidence from a case study. *Intangible Capital, 20*(1), 43–59.

Assensoh-Kodua, A. (2019). The resource-based view: A tool of key competency for competitive advantage. *Problems and Perspectives in Management, 17*(3), 143.

Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management, 27*(6), 643–650. https://doi.org/10.1177/014920630102700602

Bayo-Moriones, A., & Bello-Pindado, A. (2021). Differences in the impact of AMO bundles of line managers and frontline workers on the performance of manufacturing firms. *Academia Revista Latinoamericana de Administración, 34*(2), 201–223.

Beijer, S., Van De Voorde, K., & Tims, M. (2019). An interpersonal perspective on HR attributions: Examining the role of line managers, coworkers, and similarity in work-related motivations. *Frontiers in Psychology, 10*, 1509.

Biddle, B. J. (1986). Recent developments in role theory. *Annual Review of Sociology, 12*(1), 67–92. https://doi.org/10.1146/annurev.so.12.080186.000435

Bondarouk, T., Kees Looise, J., & Lempsink, B. (2019). Framing the implementation of HRM innovation: HR professionals vs line managers in a construction company. *Personnel Review, 38*(5), 472–491.

Chimakati, F. M., & Odiyo, W. (2023). The role of HR and line managers in policy implementation: A collaborative approach to efficiency and effectiveness. *Journal of Human Resource & Leadership, 7*(6), 84–91. https://doi.org/10.53819/81018102t30128

Collins, C. S., & Stockton, C. M. (2018). The central role of theory in qualitative research. *International Journal of Qualitative Methods, 17*(1), 1609406918797475. https://doi.org/10.1177/1609406918797475

Crawshaw, J. R., & Game, A. (2015). The role of line managers in employee career management: An attachment theory perspective. *The International Journal of Human Resource Management, 26*(9), 1182–1203. https://doi.org/10.1080/09585192.2014.934886

Creswell, J., & Poth, C. (2018). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). SAGE Publications. https://us.sagepub.com/en-us/nam/qualitative-inquiry-and-research-design/book246896

Dany, F., Guedri, Z., & Hatt, F. (2022). New insights into the link between HRM integration and organizational performance: The moderating role of influence distribution between HRM specialists and line managers. In *International Human Resource Management* (pp. 101–118). Routledge.

De Oliveira, B. (2023). Participatory action research as a research approach: Advantages, limitations and criticisms. *Qualitative Research Journal, 23*(3), 287–297.

Licensed Under Creative Commons Attribution (CC BY-NC)

Dulal-Arthur, T., Hassard, J., Bourke, J., Roper, S., Wishart, M., Belt, V., Bartle, C., Leka, S., Pahl, N., & Thomson, L. (2024). Line manager training and organizational approaches to supporting well-being. *Occupational Medicine, 74*(6), 416–422.

Engelsberger, A., Bartram, T., Cavanagh, J., Halvorsen, B., & Bogers, M. (2023). The role of collaborative human resource management in supporting open innovation: A multi-level model. *Human Resource Management Review, 33*(2), 100942.

Galletta, D. F., & Heckman, R. L. (1990). A role theory perspective on end-user development. *Information Systems Research, 1*(2), 168–187. https://doi.org/10.1287/isre.1.2.168

Katou, A. A., Budhwar, P. S., & Patel, C. (2021). Line manager implementation and employee HR attributions mediating mechanisms in the HRM system–organizational performance relationship: A multilevel and multipath study. *Human Resource Management Journal, 31*(3), 775–795.

Kehoe, R. R., & Han, J. H. (2020). An expanded conceptualization of line managers' involvement in human resource management. *Journal of Applied Psychology, 105*(2), 111–129. https://doi.org/10.1037/apl0000426

Kim, S., Su, Z. X., & Wright, P. M. (2018). The "HR–line-connecting HRM system" and its effects on employee turnover. *Human Resource Management, 57*(5), 1219–1231.

Kurdi-Nakra, H., & Pak, J. (2023). Exploring the socio-political dynamics of front-line managers' HR involvement: A qualitative approach. *Human Resource Management, 62*(4), 615–636. https://doi.org/10.1002/hrm.22150

Lundmark, R., Nielsen, K., Hasson, H., von Thiele Schwarz, U., & Tafvelin, S. (2020a). No leader is an island: Contextual antecedents to line managers' constructive and destructive leadership during an organizational intervention. *International Journal of Workplace Health Management, 13*(2), 173–188.

Lundmark, R., Nielsen, K., Hasson, H., von Thiele Schwarz, U., & Tafvelin, S. (2020b). No leader is an island: Contextual antecedents to line managers' constructive and destructive leadership during an organizational intervention. *International Journal of Workplace Health Management, 13*(2), 173–188.

Pombo, G. N., & Gomes, J. F. (2022). The link between human resources management, management values, and organizational performance: Unleashing line managers' potential. *The International Journal of Interdisciplinary Organizational Studies, 17*(1), 103.

Rimi, N. N., Yusliza, Mohd. Y., Walters, T., & Basher Rubel, M. R. (2017). The role of devolution in HR-line manager collaboration and HRM effectiveness relationship: A study of private commercial banks in Bangladesh. *Global Business and Organizational Excellence, 36*(4), 43–51. https://doi.org/10.1002/joe.21789

Ruël, H., & Gbur, M. (2017). HRM frames of HR managers and line managers: Congruence, consequences and context. *European Journal of International Management, 11*(5), 557. https://doi.org/10.1504/EJIM.2017.086697

Selçuk, A. A. (2019). A guide for systematic reviews: PRISMA. *Turkish Archives of Otorhinolaryngology, 57*(1), 57.

Thomas, F. B. (2022). The role of purposive sampling technique as a tool for informal choices in social sciences in research methods. *Just Agriculture, 2*(5), 1–8.

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Influence of ICT infrastructure on service delivery in Turkana County Government, Kenya

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ABSTRACT

E-government is the application of digital technologies, including ICT systems, networks, and online platforms, in the modernization of service provision to the public. It was initiated in the 1990s, and it tries to enhance efficiency, transparency, accountability, and responsiveness through automation of processes, lessening of bureaucracy, and increasing access of the citizen to information and services. When properly introduced, it improves resource management, boosts the confidence of the people, and is beneficial to the citizens, businesses, and civil society by providing them with more connected and trustful governance. This study aimed to establish the influence of ICT infrastructure on the adoption of e-government on service delivery in the Turkana County Government. It was anchored on the Diffusion of Innovation Theory. A descriptive survey design and correlation designs were employed, targeting 22 senior managers, 44 middle-level managers, 40 lower-level managers, and 545 technicians involved in the execution of e-government digital platforms. The sample size included 336 respondents; 230 technicians were chosen by simple random sampling, and 106 key informants (middle-level, senior, and lower-level management) were selected purposively. Data was collected using questionnaires, surveys, observations, interviews, and document reviews. The quantitative data were studied and evaluated through descriptive and inferential statistics (measures of central tendency, Pearson, regression analysis, ANOVA) and were represented in tables. The results showed that ICT infrastructure has a significant impact on service delivery, and through the regression analysis, a positive correlation was determined between the two (r=0.705, p-value=0.000). The regression analysis showed a regression coefficient of 0.563 and a p-value of 0.000. ICT infrastructure showed a regression coefficient of 0.563 and a p-value of 0.000. The researcher concluded that there was a positive and significant impact of ICT infrastructure on service delivery. The research recommended that the county government invest in consistent and stable internet services by collaborating with service providers to increase connectivity among all the sub-counties.

Keywords: Adoption of e-Government, ICT infrastructure, Service Delivery, Turkana County Government

I. INTRODUCTION

E-government as a concept was born in the 1990s and it is the use of information and communication technologies (ICT) to enhance efficiency, effectiveness as well as transparency of the operations of a government. ICT has also changed the way in which governments communicate with the citizens, businesses, and other stakeholders by computerizing their administrative processes and service provision. The final goal of e-government is to empower the efficiency, accountability, and satisfaction of citizens in the public sector by using advanced digital governance systems (Osundwa, 2024).

Adoption of e-government in service delivery is the application of ICT and the use of the internet and other digital technologies to improve responsiveness, efficiency, and effectiveness in the operations of the public sector, even though not limited to digitizing front- and back-office functions but also involves re-engineering organizational processes and automating services to improve accessibility and transparency (Onunga, 2025). Online portal integration with mobile applications and cloud systems allows governments to facilitate transactions faster, minimize bureaucracy, and enhance accountability via open government data programs (Kemboi & Premanandam, 2025).

Denmark has consistently achieved the highest scores on the United Nations E-Government Development Index (EGDI). This is a composite index that ranks the countries in terms of online services, telecommunication infrastructure, and human capital, the almost perfect EGDI score is 0.9847 in 2024. GovX Digital. Specifically, Denmark is doing well in Telecommunication Infrastructure Index, which has extensive coverage of both broadband and mobile, with almost full coverage of 5G. When it comes to maximizing ICT infrastructure for e-government service delivery, Denmark stands out as the global leader (Totonchi & Mohadis, 2025).

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In an e-government implementation study in South Africa, the authors highlight that institutional factor including proper ICT infrastructure and funding and involvement of stakeholders are important in strengthening and maintaining e-government initiatives (Shava & Vyas-Doorgapersad, 2023). The analysis was on the continued financial investment of digital government in South Africa. The research is supported by the survey by Terrance, (2023) who states that South Africa has the strongest score of 0.86 in Africa where it is far superior to the other countries in terms of sustained financial investment in digital infrastructure, identity systems, cybersecurity, and integrated online platforms.

In Kenya, e-government was officially incorporated in 2004 as a national structure with the aim of improving the quality of life of the citizens, by providing more effective, convenient and affordable services. The program marked the start of the government to enhance service provision through the use of ICT to streamline the relations between the citizen and businesses alongside the state authorities. Some of the planned services were online tax filing, downloading the passport application and digitalization of police operations. The overall e-government is expected to attain transparency, efficiency, and citizen-focused governance through ensuring that services and information are easily accessed through the internet and other electronic media. The notion of citizens as consumers of the government services is gradually becoming the defining conceptualization of Kenya in terms of the digital transformation agenda over the past decade, which is evident in the Kenya Digital Economy Blueprint and the corresponding policy frameworks (Waweru, 2022).

Turkana County, in accordance with the digital transformation policy in Kenya, has been undertaking the e-government projects in order to improve service delivery and the interaction with the citizens. Such initiatives involve the use of county websites, forums to engage the people, and the use of social media platforms to communicate. Nevertheless, the participation of the civic population is low, and such issues as insufficient technical competence, poor ICT infrastructure, and economic obstacles are still present (World Bank, 2022). There are four institutional determinants that are interplayed to make e-government successful in Turkana. The base of digital platforms is an ICT infrastructure such as internet penetration, cybercafes in cities, and mobile phone use (Ogola, 2021).

To enhance service delivery in several areas, the Turkana County has adopted several e-government solutions. A type of specific digital platform of Early Childhood Development and Education, called the Turkana ECDE Management Information System (TECDEMIS), allows collecting and managing school-level data, such as the records of pupils, administrative indicators, GIS maps, and resource planning (Kemboi, & Premanandam, 2025). Likewise, the Turkana investment promotion portal which was launched in March 2023 offers information on investment opportunities, registration of investors, monitoring of queries, and investment care thus enhancing the involvement of the private sector and economic development. The Turkana County Energy Database is a centralized platform that provides information on all facets of energy and specifically renewable energy, access, and infrastructure to enhance planning and policymaking in the energy sphere (Mwema & Mincu, 2020).

The occupation services are also digitalized with the help of the Jobs and Vacancies Portal in the official site of the county that gives an opportunity to see the job listings, view the application forms, and track the recruitment processes. The Turkana Bursary Portals, which are hosted under each sub-county, promote bursaries application and funding transparency through online means. The county has also launched Digital Billing System of the Turkana Rural Water Company (TURWASCO) in the water sector to facilitate payments through digital training of employees. Lastly, the county facilitates accountability by allowing citizens to express discontent and input regarding service delivery on an online Complaints and Feedback Form (Ogola, 2021).

1.1 Statement of the Problem

Although, both the national and county-level governments of Kenya have invested in e-government systems, the levels of adoption and proper use of these platforms in Turkana County are minimal. As stated by Dahiya and Mathew, (2018), internet penetration in Turkana is lower than the national average and there is a great disparity in the broadband penetration and ICT infrastructures. This digital divide directly limits the capacity of the citizens to use online services of the government. Moreover, the audit reports of counties from Office of the Auditor-General in 2025 indicate chronic inefficiencies in service delivery, such as the slowness of the procurement process, the absence of financial management transparency. The survey of citizen satisfaction by the Public Service Commission (2023) also reveals the problems with accessing timely information, ineffective complaint-resolution methods, and the low use of digital service platforms despite the fact that more connected counties like Nairobi or Mombasa are seen to do better than the rest. These weaknesses cast serious doubts on the sufficiency of institutional factors, including ICT infrastructure, financial resources, stakeholder participation, and human resource capacity building in promoting effective e-government adoption in Turkana County. This poses a threat to the county not achieving the transformative potential of e-government, including increased responsiveness, lower administrative expenses, and increased public trust, unless these institutional gaps are filled with specific policies and investments.

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1.2 Research Hypothesis

H_{01}: There is no significant influence of ICT infrastructure on the adoption of e-government on service delivery in Turkana County Government.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 The Diffusion of Innovation Theory (DOI)

The DOI theory informed the first objective; To establish the influence of ICT infrastructure on the adoption of e-government on service delivery in Turkana County Government. According to the Diffusion of Innovation theory, which was invented by Rogers in 1962, the situation of adoption and usage of a new technology is determined not only by the perceptions of other people about its advantages but also by the nature of the individuals who adopt it. The modern uses of the DOI by Rogers state that technology adoption in the government sector is not only tied to the perceived advantages but also to the institutional and infrastructural factors that render the advantages visible and reproducible (García-Avilés, 2020). The five DOI attributes are directly mapped to ICT infrastructure, which is one of the critical determinants of e-government adoption and include the following:

Relative advantage: Good availability networks, secure hosting, and trustworthy identity/authenticating makes transaction faster and more convenient, and is proven to be better than paper-based systems. Conformability: Standards, data exchange (APIs, registries), and interoperable platforms introduce less friction into integration with existing systems and business processes, and bring innovations in line with institutional practices (Okour et al., 2021).

Complexity: User-centric design built on the stable infrastructure (bandwidth, devices, cybersecurity) reduces perceived complexities among civil servants and citizens, enhancing intention to use. Trialability: Sandboxes, pilots, and staged deployments on common infrastructure (e.g., cloud or shared government networks) allow teams to test services at low risk, then scale them at county-wide levels (Emani et al., 2018). Observability: Dashboards and service analytics provided by reliable networks and data systems make performance improvements visible (uptime, queue times, completion rates), which reinforces diffusion by means of peer learning (Tariq et al., 2017).

The DOI attributes are simply curtailed by the underlying ICT infrastructure in counties with sparse connectivity and low power reliability. In the case of Turkana, the expanded broadband backbones, shared platforms, and cyber-secure environments, the national frameworks acknowledge the need to ensure their end-users perceive a clear relative advantage and low complexity in the county systems (e.g., the sector MIS, portals, billing platforms). The ICT policy direction of Turkana specifically predicts capacity and infrastructure, consistent electricity and last-mile connectivity, shared hosting, the ability to access devices and data governance, as the conditions to scale digital services and make pilots visible and repeatable across departments (Mohammadi et al., 2018).

Regulators of the Kenyan sector also emphasize that the device penetration and connectivity are precursors of the investments in platforms, determining citizen preparedness and workforce efficiency as the main antecedents of local-level diffusion. Concisely, DOI anticipates increased adoption whereby infrastructure enables services to be faster, interoperable, simple, testable and visibly successful. This is exactly where Turkana needs to work out so that the isolated pilots turn to a sustainable, county-wide e-government.

2.2 Empirical Review

ICT infrastructure is no new development as the implementation of e-government has always been identified to be a backbone of the project as no implementation of a digital government can be effective without the corresponding technical background. In its essential meaning, e-government infrastructure has secure servers, data and content management systems, hardware, operating systems, application development tools, and systems management platforms. These are the core of digital governance in which the governments can host platforms and provide credible online services (Yu, 2022).

Researchers throughout the world have reiterated that e-government can only be successful using ICT infrastructure, as it forms the backbone upon which digital government relies. It does not only refer to physical assets, i.e., computers, networks, databases, but also their interoperability, reliability, and flexibility (Dahiya & Mathew, 2018). Previous researchers, including (Kibria & Hong, 2024) emphasized the role of infrastructure capability in determining the results of adoption. This opinion is reinforced by more recent data, which indicates that the rates of broadband penetration, secure hosting environments, and cloud platforms have a direct positive impact on the adoption rates and citizen trust.

In Africa, poor electricity supply and lack of telecommunications infrastructure, however, remains a limiting factor to ICT adoption. Most of the rural places have substandard or unreliable electricity systems and therefore experience frequent power outages, which hamper service delivery (Dahiya & Mathew, 2018). This disparity is evident in Kenya: as of 2024, about 75 percent of households in the country had access to electricity, but the counties

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like Turkana were still many years behind, with 10 percent of households connected to electricity in those counties. Solar PV systems and mini-grids became significant in communities of refugees and hosts, which was why there was a severe necessity to find sustainable energy options to support digital infrastructure (Glyptis et al., 2020).

In Kenya, experimental studies have continuously revealed that a weak network coverage, poor hardware equipment and unreliable broadband networks lower the success of e-government projects. As an example, a study in Kisumu County established that high-speed broadband and sufficient ICT equipment enhanced communication and coordination in the local government activities. Simultaneously, the disparities in the access to ICT resources contributed to inefficiencies. On the same note, the National Optic Fiber Backbone Infrastructure (NOFBI) is not present in Turkana County, which also contributes to the digital divide (Mabele et al., 2022).

The infrastructural difficulties faced in Turkana County are aggravated by its expansive rural landscape, sparse population and little grid connectivity. Although the County Government has implemented specific digital solutions, including Turkana ECDE Management Information System (TECDEMIS) and Turkana Investment Promotion Portal, the success of these programs largely relies on the expansion of infrastructure (electricity, fiber network, and local ICT competencies). In that regard, ICT infrastructure cannot be considered a technical input, but a systemic enabler: without sustainable power, reliable connectivity, and affordable digital access, countries can hardly scale e-government services in a meaningful manner (Umbach, & Tkalec, 2022).

The latest national frameworks support this point of view. According to the UN E-Government Survey, the Digital Economy Blueprint of Kenya, the expansion of broadband, the GovTech Maturity Index, which is offered by the World Bank, shared digital platforms, and well-developed data exchange systems are the foundation of digital public services. The county-level practice at Turkana is indicative of this thought. With sectorial platforms including TECDEMIS and its Energy Data Portal, Turkana has also introduced an e-services portal as well as a long-term ICT policy that aims at leading to a fully-digitalized inclusion by 2040. Through these efforts, transaction costs are slowly reducing, service reliability increases, and these meet the needs of the citizens. According to the national statistics of the Communications Authority of Kenya, there is a growing smartphone subscription and internet penetration, and this implies that there is a willingness that Turkana can utilize through the provision of last-mile connection.

III. METHODOLOGY

3.1 Research Design

The study employed a descriptive survey research design and correlational research design. According to Abutabenjeh and Jaradat, (2018), a descriptive survey is a systematic approach used to collect data from a target population in order to explore characteristics, opinions, and relationships. On the same note, Siedlecki, (2020) stress that such design gives the researcher an opportunity to collect uniform information that facilitates descriptive as well as inferential analysis. This approach was particularly appropriate for gathering descriptive data needed for both descriptive and inferential analyses. Additionally, it helped characterize the study population and examine the relationships between dependent and independent variables.

3.2 Location of the Study

The research was conducted in the 14 departments of Turkana County Government. The researcher resides within Turkana County, which secures close proximity to the County Government. It is important to identify an appropriate site of the research that will be easily accessible to the researcher and enable him to establish a quick rapport with the informants and, in this way, be successful in data collection (Creswell & Creswell, 2017). The Turkana County was selected due to its proactive initiatives to adopt the Information and Communication Technology (ICT) to enhance service delivery. The research used a mixed research design involving descriptive survey research design and correlational research design, based on primary and secondary data. The primary data were collected by using questionnaires issued to the employees of all the departments and to the users of the e-government services, capturing their experiences and views on e-policies, procedures, and processes vital for successful e-government adoption. Secondary data was collected from relevant government reports, policy documents, and official statistics. This mixed method enabled the research to assess the success as well as the obstacles of e-government implementation to give information that can sway subsequent policy making and adjust the frameworks of service delivery.

3.3 Target Population

In this research study, the target population included 651 employees of Turkana County Government, covering County Top-Level Management across various sectors (22). This group contains executives such as the Executive Committee members, County Attorney, County Secretary, Deputy County Secretary, Commissioners, Governor's Advisors, Deputy Governor, and the Governor. They are responsible for establishing the vision, mission, and strategic goals, making major decisions, and distributing resources. The second level is County Middle-Level

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Management (44), which comprises Chief Officers, Board Secretary, Municipal Manager, County Solicitor, Deputy Municipal Manager, CEOs, Chief of Staff, Directors, Deputy Directors, and Assistant Directors. In Job groups, Q, R and S, these officials execute the top-level strategies to lower-level plans of operation, organize the activities and control the lower-level managers. The third level is Lower-Level Management (or First-Line Management) (40), consisting of officers in charge of departmental sections, Sub-Counties, and Wards, in Job groups 'L, M, N & P.' These are the foremen, team leaders and supervisors who are directly in charge of day-to-day activities of employees to ensure that work is done on schedule. The fourth critical level consists of Technicians (545), who are highly skilled and mainly responsible for executing daily key e-government technical tasks. The target population distribution is indicated in Table 1.

Table 1

Target Population

Sector	Target Population
Top-level Management	22
Middle-level Management	44
Lower-level Management	40
Technicians	545
Total	651

3.4 Sampling Procedures and Techniques

This study used two sampling techniques: Purposive and Simple Random Sampling. A Purposive sampling is a non-probability sampling technique used to select participants based on specific characteristics or criteria relevant to the research study (Clark et al., 2019). Purposive sampling was relevant in covering 100% participation of Key informants (Managerial levels) due to their in-depth knowledge related to the research objectives.

In contrast, Simple Random sampling involves A simple random sample is a randomly selected subset of a population. In this sampling method, each member of the population has an exactly equal chance of being selected (Creswell & Creswell, 2017). Because it uses randomization, it has advantage on this sample since it has high internal and external validity, and puts the research at a lower risk for research biases like sampling bias and selection bias. The overall number of respondents was 336 people: 230 Technicians, 106 Managers (Lower-level Management, Middle-level Management, and Top-level Management) of Turkana County as summarized in Table 2.

3.5 Sample Size Determination

Gathering information from all managers (Top-level, Middle-level and Lower-level) within the target population through Purposive method was easy due to their manageable population numbers, thereby ensuring full coverage and eliminating sampling error. However, since it was not possible to study all Technicians of this study target population due to constraining on time and resources, a proportion of the Technicians' population was selected. The technician sample size was calculated using the Yamane sample size determination for 1967.

$$n = \frac{N}{1+N\,(e)^2}$$

Where

n=sample size; N=population size; e=margin error (5%); 1= constant

Therefore, the sample size for registered Technicians is as illustrated below.

$$n = \frac{545}{1+545\,(0.0025)}$$

n= 230 Technicians.

Table 2

Sample Size Determination

Sector	Target Population	Sample
Top-level Management	22	22
Middle-level Management	44	44
Lower-level Management	40	40
Technicians	545	230
Total	651	336

3.6 Sampling Population

The researcher used both probability and non-probability sampling methods to select respondents. Key informants such as Lower-level Management, Middle-level Management, and Top-level Management were purposely

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chosen. At the same time, technicians were selected through simple random sampling, where individuals were picked from a group in a regular and organized manner based on probability. The sampling interval (k) will be calculated by dividing the population size by the sample size:

K=651/336~1.9.

Therefore, every 2nd-ranked Technician from the sampled list was picked.

3.7 Research Instruments

Primary data was gathered through the administration of structured questionnaires widely recognized tool for capturing reliable and comparable responses (Siedlecki, 2020). Also, Observation checklist was used. Interview schedules were used on the key informants. Secondary data was captured through document review was also used.

3.7.1 Questionnaire

A questionnaire is a methodological tool that is a written list of questions which are structured to require answers of respondents regarding their attitudes, behaviour, experiences, or features (Krosnick, 2017). It contains a systematic set of questions used to obtain data for describing, comparing, or explaining knowledge, attitudes, and behaviors. A structured questionnaire based on the 5-point Likert scale was used to collect predetermined responses from the departmental technicians and county government managers. Respondents were asked to answer questions developed from the three research questions, which provided substantial data for analysis to conclude. The questionnaire was written in simple, clear language. It was divided into two sections: the first part asked for personal information such as gender, academic and professional levels, work experience, and the officer's position. The second part requested respondents' opinions on specific questions, rated as strongly agree, agree, neutral, disagree, and strongly disagree.

3.7.2 Observation Checklist

The researcher used observation checklist to find out the availability of ICT infrastructure in the Turkana County Government which is essential for adoption of E-government services in the county government. The infrastructure involved both software and hardware components of the computers. Structured Interview was used to source information from the three levels of management who were key informants, on the adoption of e-government as well as the managers' viewpoint on how institutional determinants, such as ICT infrastructure, financial resources, stakeholder engagement, and human resource capacity building, enable successful e-government adoption in Turkana County. Coley, (2018) defines an interview schedule being the guide a researcher uses when conducting a structured interview. The interview schedule was made-up precisely of open-ended questions. The researcher systematically examined existing written materials such as; the Kenya National Audit Reports, Communication Authority of Kenya Surveys, Kenya ICT Authority Surveys, Kenya PSC Surveys, Turkana County Policy documents, Turkana County Cabinet Memos and County Assembly of Turkana Hansard Reports.

3.8 Testing for Validity and Reliability

3.8.1 Validity

Validity refers to the degree to which a research instrument accurately measures what it is intended to measure and the extent to which the findings genuinely represent the phenomenon under investigation (Creswell & Creswell, 2017). It is the extent to which the results obtained from the analysis truly represent the phenomenon under study. The validity of the instrument was used to measure how well the items represented the specific areas covered by the survey. Scholars of the research profession tested the instrument by looking at the method of measuring and coverage of the aims of the study. The supervisors also checked the instruments validity and they were convinced that the questionnaire items were correct. The researcher worked closely with the experts in maintaining the reliability of the instruments, in ensuring that all the research objectives were addressed from the information sought in the instruments. The findings of the pilot study went a long way in improving the questionnaire, thereby enhancing its dependability.

3.8.2 Reliability of the Research Instrument

Reliability is the extent to which a research instrument is stable and reproducible in a variety of applications and situations. In other words, the reliability of an instrument is said to be true when measurements taken under the same conditions give the same results. It also pertains to the stability, accuracy, and precision of measurement. To ensure this, the researcher administered the instruments in person to evaluate their clarity. To assess the reliability of the research instruments, the split-half method was used, where the questionnaire was given to two groups, odds and evens, and the results compared. This technique measures how well all parts of the test contribute equally to what is being measured. It was done by comparing the results of one half of the test with the other half. Cronbach's alpha was

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used to test the reliability of the measures in the questionnaire. Cronbach's Alpha was used to assess the internal consistency (reliability) of the questionnaire. The researcher tested the reliability of each research variable, which was between 0.75 and 0.81, indicating that the questionnaire was distributed to research professionals for critique and suggestions on necessary changes to improve its validity. The instrument was also corrected to add some corrections on questions that were identified to make it valid. Validity was assured by ensuring that the questions reflected what they were supposed to measure that is, clarity of words used and whether the respondents understood all questions. The researcher found out areas of confusion and ambiguity and corrected them, formulating questions in a clearer way, which served the purpose of collecting similar responses among various participants. An internal consistency of the instruments with a correlation coefficient of r = 0.7 or higher was considered acceptable. The reliability of research variables is indicated in Table 3.

Table 1

Reliability of Research Variables

Variable	Cronbach's Alpha if Item Deleted
ICT Infrastructure	.708
Service Delivery	.724

The closer Cronbach's alpha coefficient is to 1, as displayed in the table above, the main variables of the study had a scale of above 0.7, the higher the internal consistency reliability (Sekaran, 2006), therefore the instrument was reliable for collecting data.

3.9 Data Collection Methods and Procedure

Research data was collected through researcher aided self-administered questionnaires and researcher observation checklist. Both tools were responded to under the guidance of the researcher. A conducive atmosphere to the respondents was sought by the researcher, to enable the respondents to open up and respond to the questions honestly. A cover letter from Turkana University College and a research license were submitted to facilitate the administration of the research instrument. Respondents were assured of the confidentiality of their names and responses, which would be handled only by the researcher and used solely for academic purposes. Each research instrument was coded, and only the researcher knew which response belonged to which respondent. The study participants were invited to participate in the online survey using the appropriate platform. The researcher made a prior visit to relevant offices within Turkana County Government to familiarize themselves and to initially administer the tools to Key Informants. This approach was deliberately applied to obtain deeper insights and clarify issues that were not fully captured through the questionnaires (Creswell & Creswell, 2017).

3.10 Data Analysis and Presentation

Data analysis is the systematic process of organizing, coding, and interpreting collected information to make it meaningful and helpful in drawing valid conclusions (Creswell & Creswell, 2017). For this study, quantitative data was generated through questionnaires. The collected data was put into categories, edited, coded, then analysis was carried out. Editing was to make sure that the responses were given to all questions, accurate and worthy to conclude from. Questions whose responses were in the Likert scale were computed by assigning values in numbers to enable quantitative analysis. The Statistical Package for Social Sciences (SPSS version 25) was used to electronically capture and analyze the quantitative data obtained from the questionnaire. The analysis included both descriptive and inferential statistics. Pearson correlation was used to establish the association between the determinants of E-government adoption and Service delivery in Turkana County Government, and was subjected to a 0.05 test significant value. Such techniques indicate the direction and magnitude of the relationship between the independent variables and the dependent variable. The researcher applied regression analysis to evaluate the study's hypotheses because regression is well known as a powerful statistical tool used in testing the relationships between the dependent and independent variables in modern research (Hair et al., 2019). This quantitative data was presented through tables.

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IV. FINDINGS & DISCUSSION

4.1 Descriptive Statistical Analysis

The respondents were asked to rate various statements that helped in establishing the influence of ICT infrastructure on the adoption of e-government and its effect service delivery in Turkana County Government. The results were shown in Table 4.

Table 4

ICT Infrastructure and Service Delivery

No.	ICT Infrastructure	1 SD	2 D	3 N	2 A	1 SA	Total
1.	My county has internet infrastructure to enhance public service delivery	84 44.4%	71 37.6%	8 4.2%	11 5.8%	15 8.0%	189 100.0%
2.	The county embraces online platforms to advance service delivery for citizens	89 47.1%	52 27.5%	11 5.8%	13 6.9%	24 12.7%	189 100.0%
3.	My county has integrated e-government systems	91 48.2%	64 33.9%	4 2.1%	18 9.5%	12 6.3%	189 100.0%
4.	The ICT infrastructure is adequate in its operations	81 42.9%	62 32.8%	10 5.3%	20 10.6%	16 8.4%	189 100.0%
5.	The county's online platforms, like the website and interface, are client–oriented	75 39.7%	66 34.9%	7 3.7%	22 11.6%	19 10.1%	189 100.0%
6.	County e-government services are accessible to citizens	21 11.1%	37 19.6%	13 6.9%	49 25.9%	69 36.5%	189 100.0%

Respondents were asked on whether their county has internet infrastructure to enhance public service delivery. The findings showed that most of the respondents (82.0%) were of the opinion that this was not the case and thus, Turkana County continues to experience a big problem in terms of having a consistent ICT infrastructure which can support effective implementation of the e-government. This means that a majority of the public offices, service delivery points would be inaccessible due to unstable internet connections that in turn restrict automation, efficiency and availability of public services. This is in line with Dahiya and Mathew (2018) who affirm that low level of ICT infrastructures and low internet penetration are still among the greatest barriers to e-government implementation in most developing countries because it acts as a hindrance towards the successful incorporation of the digital tools in government. Some of the respondents (13.8%) agreed indicating that there are isolated cases where ICT infrastructure is available, maybe in more urbanized areas or in county headquarters where there is basic connectivity and digital infrastructure. This is consistent with Mabele et al. (2022), who add that e-government projects are usually initiated at centralized locations with more technological capabilities and then extended over time to isolated areas. The neutral answers (4.2) can be of people who either do not know of ICT initiatives in their locations or feel that the current infrastructure is not adequate yet is improving. This was backed up using the data collected through the key informants when they were questioned whether they have frequent Internet failures and the impact of the same to service delivery. Key informant 1 noted the following;

> *Yes, the internet regularly experiences downtimes and they impact greatly on service delivery within the county. Online systems communicate with most of the departments and process data and services. The internet failure reduces the pace of the operations significantly, and service delivery to citizens is also delayed and, occasionally, the staff members are compelled to switch to the manual system which is not as efficient, and time-consuming.*

According to the statement of the key informant, the problem of the unreliability of the internet connection is also among the most significant issues of the functioning in the Turkana County. The frequent downtimes disrupt the regular performance of the county departments and lead to delays in handling the information, inefficient coordination between the offices and ineffectiveness at large in terms of service delivery. The fact that the staff members in most of the cases are being forced into manual systems is testimony to the fact that e-government initiatives are yet to be entrenched and they depend on a constant internet connection. This does not only slow down the operations of the public services, but also spoils the trust of the citizens with the digital platforms. The quote also emphasizes that the absence of a stable ICT infrastructure implies that the e-government benefits of speed, transparency and accessibility cannot be reaped to maximum given the system can be easily influenced by the interference to the intended performance.

The study asked a question of the issue of whether the county embraces the use of online platforms to advertise service delivery among the citizens. The results indicated that the difference between the respondents who agreed and those who did not agreed, meaning that majority of the citizens do not believe that the Turkana County Government has effectively modified online platforms to provide its services was 74.6%. It means that the nation is

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always experiencing the same problems in the form of ineffective ICT infrastructure, weak internet connectivity, and poor digital illiteracy rates among citizens and civil servants. Dahiya and Mathew (2018) assert that inadequate ICT infrastructure and institutional capacity are the major challenges with e-governments adoption and implementation, particularly in the developing world with low technological readiness. Similarly, Umbach and Tkalec (2022) observe that the shortage of infrastructures, high cost of data services, and unequal access to digital tools are limiting the adoption of digital governance in majority of African contexts, and this is also applicable in the Turkana County. On the other hand, there were also respondents (19.3) who believed that the county embraces the use of online platforms and this implies that some departments in the county may have embraced some use of e-government activities, such as, use of websites or social media to provide and pass information. This percentage as a small portion tells some initial steps to digitization, but not popular yet. The degree of transparency, efficiency and citizen involvement in government activities can be enhanced using the ICT infrastructure as seen by Dahiya and Mathew (2018) whereby the infrastructure is in place and well-coordinated. Another point emphasized by Gillwald et al. (2019) on the topic is that partial ICT implementation within the governance industry will improve access to information and administrative efficacy provided that there is a stable policy and an investment in infrastructures. The remaining 5.8 percent of the neutral respondents are likely to refer to the unconvinced or even non-aware people of the on-going e-government efforts and therefore, improved communication and sensitization in the digital service platforms is required.

They were asked to answer the questions in regards to the adoption of e-governments by the county in which they were residing. The study aim was to establish the integration of the e-government systems in Turkana County. The results indicated that the majority of the participants (82.1) disagreed with the suggestion that a majority of the county citizens are yet to integrate or adapt e-government systems holistically. This can mean that the county continues to have significant amount of manual service delivery, and less amount of technology that can either help to enhance efficiency, accountability or accessibility. Such factors as inadequate ICT infrastructure or inadequate technical capacity or lack of budget funding of digital transformation may lead to the lack of integration. A low proportion of the respondents (15.8) answered in the affirmative, and this implies that there are a few departments or sectors in the county government that may have already started using some form of digital tools or systems, such as online databases or mediums of communication, but is not already widespread across the county. The small number of the neutral (2.1) may be interpreted as individuals who did not know or did not know about any e-government activities in the county which is feasible as the systems were not publicized or made available to the common people. The information above discussion was in line with the information obtained following the interview with the key informant who was asked to answer the question of what kind of Information Systems are currently being run in your department. Key informant 2 noted that;

> *We primarily utilize the simple information systems within our department, namely Microsoft Excel in the data entry and file keeping, and email services in communication. Another example is that there are some instances in which document storage is done using digital filing systems. Nevertheless, these systems are not intertwined among departments so data sharing and coordination is very challenging and time consuming.*

The response of the key informant points out that although some means of digital tools are present in the departments of the Turkana County, they are minimal and restricted in terms of scope and functioning. Its use of simple tools like the Excel and email platform is an indication that the county is yet to graduate into a complete e-government system where information is easily shared amongst departments. Such interconnectivity is a barrier to service delivery coordination, transparency, and efficiency. It also substantiates most of the respondents who believed that the county has not embraced the integrated e-government systems. This scenario displays a rudimentary attitude to digital transformation where single departments are working in silos and not using a single digital platform; this slows down the process of a successful and comprehensive e-government implementation.

The respondents were questioned whether the ICT infrastructure is appropriate in its operations. The findings show that 75.7% voted in the negative, 5.3% were equal and 19.0% voted in the affirmative. The results indicated that most of the respondents (75.7%) disagreed which means that most citizens and employees feel that there is a shortage of the ICT infrastructure in the county that can enable efficient implementation of e-government and service delivery. It means that essential elements like the internet connection, digital devices, and support machines are non-existent or immature, and this compromise the performance and creativity in the county activities. Some respondents (19.0) were in agreement, indicating probable absence of even development or complete advancement in infrastructure investment development of the county in that some departments or units might be having relatively better ICT facilities. The low number of neutral respondents (5.3) could be connected to people that are either not aware of the situation with the ICT infrastructure in the county or are not sure whether it is sufficient because they have little contact with the digital systems. Using these findings as a prism of the Resource-Based Theory, one can see that the ICT infrastructure is a highly important strategic resource that could give the county an edge in its public service delivery provided that it is developed and used adequately. The inadequacy recorded by the majority of the respondents implies that Turkana

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County has not fully tapped its technology to enhance the efficiency of operations, transparency, and satisfaction among citizens.

The participants were consulted on whether the county online platforms such as the website and interface are client oriented. The findings indicated that most of the respondents (74.6%) were in the opposite and it means that most citizens feel that the online platforms existing in the county are not user friendly or receptive to their needs. This means that such platforms might not be designed or operated based on the easy to use and access as well as interactiveness and thus limits their potential in supporting service delivery. Totonchi and Mohadis (2025) argue that most counties in Kenya are finding it a challenge to make their digital platforms customer-oriented because of their limited ICT capacity, poor stakeholder consultation, and lack of system upgrades. On the same note, Mabele et al. (2022) observe that lack of usability and inclusion of user feedback undermines citizen trust and engagement in digital governance. Conversely, some respondents (21.7) also affirmed that the online platforms in Iava County are client-focused, albeit that some users perceive it to be convenient and easy to use in order to gain access to information or use some services. This low percentage can be taken to mean that some sections of the county government have started to adopt user-friendly digital solutions. When e-government systems are user-friendly, i.e. have a user-centered design, with user-friendly navigation, understandable content, and responsiveness, they can increase citizen satisfaction, as well as, as Mabele et al. (2022) note, transparency. The fact that the number of neutral respondents is just 3.7 can be an indication of people who have fewer or no exposure or experience with the online services of the county either because of low digital literacy or poor communicated information about the presence of e-services.

The respondents were questioned on the issue of accessibility of county e-government services to citizens. These findings revealed that most of the interviewees (62.4% of the total number) were in agreement, so most of the citizens consider the e-government services in the county relatively convenient and available. This is an indication that the Turkana County has recorded a significant improvement in the digital accessibility via online platforms or service points that allow citizens to access information, place applications or ask questions conveniently. Nonetheless, even with this relatively good attitude, there are those who (20.7) did not agree suggesting that there are still some citizens that face difficulties in accessing these services which may be through inadequate internet connectivity, lack of ICT facilities or digital illiteracy in the rural regions. The low percentage of the neutral ones (6.9) can be viewed as the number of ambiguous respondents who are not sure about the existence of such services, perhaps, due to the lack of contacts with it or simple ignorance of its presence. The interpretation of the findings as per the Theory of Diffusion of Innovation indicates that Turkana County is at the initial phases of the adoption process with e-government innovations starting to diffuse among the citizens but has not yet been fully saturated. This theory explains that accessibility and high prevalence are influenced by the awareness, perceived usefulness, and ease of use variables, which seem to be improving in the county yet need strategic communication and capacity-building to be achieved to reach all the citizens. The discussion is consistent with the information provided by key informants when he told me about the approach used by the County in ensuring stable network connections across Sub-counties. Key informant 3 noted that;

The county has collaborated with the internet service providers to provide network access to additional sub-counties and major administrative centres in particular. We have also provided Wi-Fi hotspots in select offices, which will ensure that staffs and citizens who need access to e-government services remain connected. Nevertheless, the problem of connectivity is still common in remote areas because of the inadequate infrastructure and the distance between network towers.

The answer of the key informant throws more light in the fact that although the Turkana County has made significant efforts to enhance network accessibility through agreements with service providers and enthusiasm on Wi-Fi hotspots coverage is not uniform. Administrative centres have been the main beneficiary of the initiatives thus explaining why most of the respondents consider e-government services to be accessible. Nevertheless, the fact that there are constant issues with connectivity in remote locations substantiates the results that these services have not yet been made accessible to all citizens. Such uneven coverage of network infrastructure highlights the place the county is at in the early adoption phase outlined in the Theory of Diffusion of Innovation where it can be seen but has not penetrated much yet. It also indicates that although the accessibility to the e-government platforms is on the rise, there is a need to invest more and plan better to achieve equitable digital inclusion in all the sub-counties.

Furthermore, the respondents were asked to rate various statements that helped in identifying the state of service delivery in Turkana County Government, Kenya (the dependent variable). The results were shown in Table 5.

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Table 5
Service Delivery

No.	Rate service delivery in:	1 VP	2 P	3 UD	4 G	5 E	Total
1.	e-government quality services	73 38.6%	62 32.8%	12 6.4%	22 11.6%	20 10.6%	189 100.0%
2.	e-government reliability	60 31.8%	73 38.6%	8 4.2%	23 12.2%	25 13.2%	189 100.0%
3.	e-government accessibility	55 29.1%	62 32.8%	14 7.4%	27 14.3%	31 16.4%	189 100.0%
4.	e-government efficiency	75 39.7%	61 32.3%	9 4.8%	21 11.1%	23 12.1%	189 100.0%
5.	e-government satisfaction	63 33.3%	67 35.5%	6 3.2%	24 12.7%	29 15.3%	189 100.0%

NB: Very poor (VP); poor (P); Undecided (UD); Good (G); Excellent (E)

The respondents were requested to evaluate the e-government quality services. The findings demonstrate that there is an evident level of customer dissatisfaction with e-government service provision in the Turkana County. The majority of the respondents, 38.6% perceived the services as very poor, and this could imply that a high number of citizens find it very difficult to interface with the platforms, perhaps because of poor digital infrastructure, slowness in response, or poorly-integrated services. The rating of services as poor was found to be 32.8 percent which supports the argument that the adoption of e-government has not yet implanted efficient or reliable service delivery to most people. A small portion of users, 6.4%, did not respond, which means that there is a possibility that a small group of respondents were not exposed to the services much or were not informed enough to have an opinion, which points to the problem of access, awareness, or participation. Conversely, a small fraction of the respondents found the services to be positive with 11.6% rating services as good and 10.6% as excellent indicating that there are pockets of effectiveness, which are not pervasive but may be concentrated in the departments, user groups, or better managed services.

The respondents were requested to scale e-government reliability. The findings show that most of the respondents feel that e-government reliability in Turkana County is not satisfactory with most of the respondents (31.8) considering it very poor and a very slight percentage (38.6) considering it poor, which means that poor system failure, downtime, or inconsistent service delivery is likely to be compromising the user trust. Small percentage (4.2) of the respondents was neutral indicating that they either had little exposure to the e-government platforms or they were not sure of their performance. Conversely, the majority of respondents actually had a negative perception of the services with 12.2% considering the services to be good and 13.2% considering the services to be good, meaning that only a small proportion of the users actually experience good service delivery especially in certain departments or to certain services that are more effectively managed. The discussion is congruent with the data provided in the key informants where they were questioned on the effects that the state of ICT Infrastructure had on reliability and satisfaction in service delivery. Key informant 9 noted that;

ICT infrastructure conditions have a significant impact on the reliability and satisfaction of e-government services. In most situations, the system is prone to failure and delays due to unstable internet connection, obsolete equipment's and lack of technical support. This impacts the performance of staff members as well as the trust people have on digital services since most users frequently encounter failures or extremely long queues in accessing online services.

This reply of the key informant confirms the survey results that the majority of the respondents consider the e-government reliability in Turkana County to be poor. The reference to poor internet connectivity, inefficient technology, and inadequate support facilities points to the infrastructural issues that destroy the smooth flow of service delivery. Such aspects cause system failure and slowness, which decrease its performance and eliminate user confidence in online platforms. The connection between bad ICT infrastructure and low satisfaction is that reliability is contingent on healthy technological infrastructure that guarantees continuity in its access and a consistent provision of its services. The quote also shows that the county is not in a position to be stable in terms of operations without modern equipment's and proper technical capacity, which explains the negative impression that was captured by the survey results. ICT infrastructure empowerment, hence, is among the major needs to enhance stability and citizen contentment in the provision of e-government services in Turkana County.

The respondents were inquired on the e-government accessibility. The findings indicate that most of the respondents feel that access to e-government services in the Turkana County is poor with most of the respondents (29.1) scoring it as very poor and slightly more (32.8) as poor indicating that most citizens have considerable challenges in accessing the services and this may be as a result of poor internet connectivity, lack of digital devices or lack of user support. The number of those who were not sure (7.4) was minimal, and thus the percentage of the users

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who might not be exposed to the platforms a lot or are not certain of them being available would be very small. On the other hand, few respondents positively rated the services with 14.3 percent of the respondents rating the services as good and 16.4 percent of the respondents rating the services as excellent indicating that some users have satisfactory access to these services, and this should probably be in regions with improved infrastructure or service provision is more targeted. The findings are consistent with the data gathered through the key informants when requested to provide suggestions on how the appropriate funding enhanced the availability and satisfaction of County Government Services. Key informant 10 stated that;

Adequate funding has made the County Government services very accessible and satisfactory as it is able to invest in stable internet connections, purchase of current ICT equipment and implementation of easy-to-use platforms. It has also enabled the staff training so as to enable the citizens to utilize the e-government systems so that more citizens are able to access services effectively in any places hence minimizing the barriers and increasing the overall service delivery.

The statement made by the key informant is consistent with the survey results that indicated that there was little accessibility of e-government services in the Turkana County. The quote justifies why certain people can enjoy good or excellent accessibility to internet connection, ICT equipment, and staff capacity even as the majority continue to struggle because of funding. It highlights that the key requirements of digital infrastructure expansion, technical assistance, and fair access to e-government services in various regions of the county require specific financial investments. This proves that ineffective funding has a direct influence on the availability and satisfaction of the services.

The respondents were to provide rating on e-government efficiency. The findings show that most respondents feel that e-government efficiency at Turkana County is unsatisfactory with a large number of the respondents (39.7) rating it very poor with a considerable percentage (32.3) rating it poor, meaning that the systems could be sluggish, cumbersome, or fail to provide services to the citizens on time. The number of respondents who were not sure (4.8) was very minimal, hence the low interaction with the e-government platforms or lack of awareness about their effectiveness. The percentage of respondents who rated the services positively was minimal with 11.1% stating that they are good and 12.1% that they are excellent meaning that not many people experience efficient service delivery, maybe in certain sections or when performing certain processes which are managed better. The discussion concurs with the details provided by the key informants when they were questioned to talk about how the involvement of the stakeholder's enhanced efficiency and satisfaction in service delivery. Key informant 11 noted that;

The involvement of stakeholders has enhanced efficiency and satisfaction in service delivery by making coordination, feedback and collaboration between the county government, citizens and partner organization to be more effective. Stakeholders also facilitate the identification of the bottlenecks, introduction of improvements, and streamlining of processes through regular consultations and involvement in decision making. This involvement enables services to be more responsive, minimizes delays and makes the overall effectiveness of e-government platforms more effective.

The above statement made by the key informant assists in understanding the reason why small percentage of the users rated e-government efficiency positively. It implies that where stakeholder engagement is actively practiced in the areas or departments, there is coordination of processes, and provision of a better service delivery. On the other hand, poor and very poor rates are high indicators of the fact that many parts of the county are yet to be fully engaged with stakeholders resulting to sluggish, tedious or inconsistent service delivery. This highlights the need to have a large number of people involved in order to improve effectiveness.

The respondents were requested to evaluate E-government satisfaction. The findings have shown that most of the respondents are not satisfied with the e-government services in Turkana County with most of the respondents (33.3%) reporting their satisfaction to be very poor and slightly more respondents (35.5%), reporting their satisfaction to be poor, which shows that the services are not satisfying the citizens as expected in terms of quality, responsiveness or usability. Only a small number of respondents (3.2%) were not sure, which means that a small portion might have limited usage of the platforms, or it is not clear as to whether they have the experience. On the other hand, the percentage of those who were satisfied was only available in the minority of the respondents, with 12.7% registering it as good and 15.3% registering as excellent, proving that the satisfactory experiences are only available to a small percentage of the users, maybe where there is better management of the services or accessibility.

4.2 Inferential Statistical Analysis

4.2.1 Correlation Analysis between ICT Infrastructure and the Adoption of E-Government on Service Delivery

Pearson product moment correlation was used to examine the strength and direction of the relationship between ICT infrastructure and the adoption of e-government on service delivery in Turkana County Government. Correlation analysis is used to determine how two variables vary in the same direction and the variables have a Correlation of -1 to +1. Correlation values of +1 represent perfection of positive relationship, -1 represents perfection

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of negative relationship and 0 represents no linear relationship. Practically, correlations of 0.1 to 0.3 are weak, 0.3 to 0.5 moderate and 0.5 and above strong. The analysis has been done at 95% confidence level and it states that there is a 5 percent probability of arriving at the conclusion that there is a relationship when none exists. These findings were indicated in Table 6.

Table 6

Correlation Analysis between ICT Infrastructure and the Adoption of E-Government on Service Delivery

		Service Delivery
ICT Infrastructure	Pearson Correlation	.705**
	Sig. (2-tailed)	.000
	N	189

**. Correlation is significant at the 0.01 level (2-tailed).

Findings expressed a correlation of 0.705 at a p-value of 0.000 which implied that there is a strong and positive statistically significant relationship that exists between ICT infrastructure and the adoption of e-government. This means that the higher the ICT infrastructural elements like to better internet connectivity, hardware, and software, the greater is the e-government adoption. That is, with the continued development of ICT infrastructure in Turkana County, the government is more likely to offer services electronically, which will enhance efficiency, accessibility, and responsiveness to the needs of citizens. These results are consistent with the study of Mabele et al. (2022), who state that the well-developed ICT infrastructure plays a huge role in the adoption of e-government because it allows interacting with each other more facilitates and positively influences the results of delivery of certain services to the population.

4.2.2 Regression Analysis

4.2.2.1 Model Summary on ICT Infrastructure and Service Delivery

The model summary gives a statistical profile to the relationship between the independent variable and the dependent variable in the study. It was applied in this case to explore the effect of ICT infrastructure on the adoption of e-government on service delivery in Turkana County Government. The multiple correlation coefficient is referred to as the R value, and it quantifies the direction and strength of relationship between observed and predicted value of dependent variable. It shows the strength of association of the independent variable(s) in unison with the dependent variable. Instead, R-square value expresses the coefficient of determination which indicates the share of the variance in the dependent variable which is accounted by the independent variable in the model. The results were shown in Table 7.

Table 7

Model Summary on ICT Infrastructure and Service Deliver

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.578[a]	.334	.264	.18968

The results indicate that the R value of 0.578 represents a moderate positive multiple correlation between ICT infrastructure and e-government adoption, meaning that improvements in ICT infrastructure are moderately associated with better service delivery outcomes. The R-square value of 0.334 shows that 33.4% of the variation in e-government adoption can be explained by ICT infrastructure, while the remaining 66.6% is attributed to other factors not captured in this model.

4.2.2.2 ANOVA on ICT Infrastructure and Service Delivery

Analysis of Variance (ANOVA) was used to determine whether there were significant differences in the mean levels of e-government adoption across varying levels of ICT infrastructure in Turkana County Government. The comparison of the difference between and within groups will be done through ANOVA in order to establish the statistical significance of the difference observed. The F-test value demonstrated the ratio between-group and within-group variance and p-value lower than 0.05 at 95 percent confidence level indicated the presence of significant effect. Table 8 indicated the results.

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Table 8

ANOVA on ICT Infrastructure and Service Delivery

ANOVA[a]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2.369	1	2.369	29.987	.000[b]
	Residual	14.773	187	.079		
	Total	17.142	188			

a. Dependent Variable: Service Delivery

b. Predictors: (Constant), ICT Infrastructure

The ANOVA results showed an F-test value of 29.987, which is greater than the F-critical value of 3.89, with a p-value of 0.000. Since the F-calculated exceeds the F-critical and the p-value is below 0.05, the findings indicate that ICT infrastructure has a statistically significant influence on the adoption of e-government in Turkana County Government. This means that the advancements in the ICT infrastructure like better internet connection, sound digital infrastructure, and technological applications greatly facilitate the e-government uptake and subsequently result in the delivery of public services in a more efficient and effective manner.

4.2.2.3 Regression Coefficients of ICT Infrastructure and Service Delivery

Regression analysis was conducted to determine the extent to which ICT infrastructure influences the adoption of e-government on service delivery in Turkana County Government. The findings showed that the constant value was 2.981, which is not insignificant at the confidence interval of 95 percent, thus showing that despite the absence of ICT infrastructure, there is still a minimum level of e-government adoption. This suggests that other institutional factors contribute to the existing level of e-government implementation. The implication of the significant constant is that the process of adopting e-government depends on both the ICT infrastructure and on the underlying systemic and organizational capacity within the County Government. The results were shown in Table 10.

Table 1

Coefficients of ICT Infrastructure and Service Delivery

Coefficients						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.981	.748		3.985	.005
	ICT Infrastructure	.563	.101	.338	5.611	.000

Dependent Variable: Service Delivery

Predictors: (Constant), ICT Infrastructure

From the above results, the following regression model was established;

Y=2.981 + 0.563 ICT Infrastructure

The regression coefficient of 0.563, with a t-value of 5.611 and a p-value of 0.000, which is less than the significance level of 0.05, indicates a statistically significant positive relationship between ICT infrastructure and e-government adoption. Since the computed t-value exceeds the t-critical value of 1.653, the results confirm that ICT infrastructure has a meaningful and strong influence on e-government service delivery. Therefore, the null hypothesis that ICT infrastructure had no significant effect on e-government adoption was rejected. This suggests that with each increment in ICT infrastructure, there is a concomitant increase of 0.563 in the stage of e-government adoption implying that, improved and efficient service delivery is the result of improved technological facilities, improved internet connectivity, and improved digital systems. This is aligned with the findings of Onunga, (2025), who noted that the ICT infrastructure is the backbone of successful e-government implementation since it enables transparency, accessibility and responsiveness when it comes to the delivery of public services.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The research determined that e-government adoption and service delivery in the Turkana County Government is a key attribute of the ICT infrastructure. Descriptive findings and interviews indicated that the problem of unreliable internet connectivity, low digital systems, and the inability to cross-departmental integration prevent efficiency, coordination, and service accessibility. Even though there is some improvement in the urban centres, majority of the areas continue to encounter infrastructural problems. Correlation analysis showed a strong positive relationship (r =

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0.705, p = 0.000), and regression results indicated a significant effect (β = 0.563, t = 5.611, p = 0.000) of ICT infrastructure on e-government adoption. The researchers thus came up with the conclusion that ICT infrastructure played a big role in the implementation of e-government on service delivery in Turkana County Government.

5.2 Recommendations

The research found out that ineffective internet connection and constant disconnections are one of the biggest constraining factors to the successful implementation of e-government in Turkana County. The lack of network coverage in remote locations is slowing down service delivery and compelling departments to use manual systems. The research thus suggested that the county government should invest in the stable and widespread internet infrastructure by collaborating with service providers in an attempt to widen the internet connectivity in all sub-counties.

Results revealed that the majority of county departments have simple, disconnected digital tools and that sharing data and coordinating them are challenging. This is because lack of system integration restricts efficiency and transparency when delivering the services. The research thus suggested that the county should come up and execute an integrated e-government system that would have all the departments linked via a central digitalized system. The research also determined that not all citizens and staff possess the necessary digital skills and knowledge of the e-government services available to them. This has an impact on the accessibility and usability of the online platforms. The report thus suggested that the county should carry on an ongoing ICT training and digital literacy of the workers and citizens so as to bolster competent, conscious, and effective use of e-government platforms.

REFERENCES

Abutabenjeh, S., & Jaradat, R. (2018). Clarification of research design, research methods, and research methodology: A guide for public administration researchers and practitioners. *Teaching Public Administration, 36*(3), 237–258.

Clark, T., Foster, L., & Bryman, A. (2019). *How to do your social research project or dissertation*. Oxford University Press.

Coley, J. S. (2018). Interview schedule. Supplement A for *Gay on God's Campus: Mobilizing for LGBT equality at Christian colleges and universities*. Chapel Hill.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches.* Sage Publications.

Dahiya, D., & Mathew, S. K. (2018). IT infrastructure capability and eGovernment system performance: An empirical study. *Transforming Government: People, Process and Policy, 12*(1), 16–38.

Emani, S., Peters, E., Desai, S., Karson, A. S., Lipsitz, S. R., LaRocca, R., Stone, J., Suric, V., Wald, J. S., Wheeler, A., Williams, D. H., & Bates, D. W. (2018). Perceptions of adopters versus non-adopters of a patient portal: An application of diffusion of innovation theory. *Journal of Innovation in Health Informatics, 25*(3), 149–157.

García-Avilés, J. A. (2020). Diffusion of innovation. *The International Encyclopedia of Media Psychology, 1*(8), 1–8.

Gillwald, A., Mothobi, O., Ndiwalana, A., & Tusubira, T. (2019). The state of ICT in Uganda. Research ICT Africa.

Glyptis, L., Christofi, M., Vrontis, D., Del Giudice, M., Dimitriou, S., & Michael, P. (2020). E-Government implementation challenges in small countries: The project manager's perspective. *Technological Forecasting and Social Change, 152*, 119880.

Hair Jr, J., Page, M., & Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.

Kemboi, M. K., & Premanandam, P. (2025). Reimagining public service delivery in Kenya: Evaluating the impact of e-governance and Huduma services amidst the 2025 public sector reforms. https://doi.org/10.21203/rs.3.rs-6953581/v1

Kibria, M. G., & Hong, P. (2024). E-government in Asian countries: A conceptual framework for sustainable development. *Transforming Government: People, Process and Policy, 18*(4), 616–637.

Krosnick, J. A. (2017). Questionnaire design. In *The Palgrave Handbook of Survey Research* (pp. 439–455). Springer International Publishing.

Mabele, L., Sevilla, J., Mugeni, G., Sonoiya, D., Wasige, E., & Ronoh, K. (2022). Rebuilding digital inclusion for the rural counties of Kenya. Springer Nature Switzerland.

Mohammadi, M. M., Poursaberi, R., & Salahshoor, M. R. (2018). Evaluating the adoption of evidence-based practice using Rogers's diffusion of innovation theory: A model testing study. *Health Promotion Perspectives, 8*(1), 25.

Mwema, E. S., & Mincu, M. B. (2020). Factors affecting Kenya Revenue Authority service delivery at Huduma Centre in Tana River County (Post Graduate Diploma, Jomo Kenyatta University of Agriculture and Technology).

Licensed Under Creative Commons Attribution (CC BY-NC)

Ogola, C. (2021). Evaluation of institutional determinants of e-government adoption in the National Government Administrative Units in Kenya: A case of Migori County. *SSRN Electronic Journal*, 5086978.

Okour, M. K., Chong, C. W., & Abdel Fattah, F. A. M. (2021). Knowledge management systems usage: Application of diffusion of innovation theory. *Global Knowledge, Memory and Communication, 70*(8/9), 756–776.

Onunga, J. (2025). Digital transformation in public administration and data-driven decision-making: A review of Turkana County Government. *International Journal of Research and Innovation in Applied Science, 9*(12), 234–240. https://doi.org/10.51584/ijrias.2024.912022

Osundwa, K. K. (2024). Influence of adoption of e-government on service delivery at Huduma Centres in Kenya: A case of Nairobi County (Doctoral dissertation, University of Nairobi).

Public Service Commission. (2023). *Annual report 2022/2023*. Public Service Commission, Kenya.

Shava, E., & Vyas-Doorgapersad, S. (2023). Inclusive participation in information and communication technologies (ICTs) processes for smart services in the City of Johannesburg. *Insights into Regional Development, 5*(1), 26–40.

Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist, 34*(1), 8–12.

Tariq, M. F., Pangil, F., & Shahzad, A. (2017). Diffusion of innovation theory: Beyond decision stage. *International Journal of Advanced and Applied Sciences, 4*(5), 12–18.

Terrance, M. T. (2023). E-government and e-participation on improving e-service delivery in Bushbuckridge Local Municipality, South Africa. *Journal of African Films and Diaspora Studies, 6*(2), 99.

Totonchi, A., & Mohadis, H. B. M. (2025). E-government between developed and developing countries: Key perspectives from Denmark and Iraq. *Jurnal Ilmu Komputer dan Informasi, 18*(1), 77–93.

Umbach, G., & Tkalec, I. (2022). Evaluating e-governance through e-government: Practices and challenges of assessing the digitalisation of public governmental services. *Evaluation and Program Planning, 93*, 102118.

Waweru, N. P. (2022). Determinants of implementing e-government in Kenya: Case of Nakuru Town Huduma Centre (Doctoral dissertation, Kenyatta University).

World Bank. (2022). *GovTech maturity index 2022 update: Trends in public sector digital transformation*. World Bank.

Yu, P. (2022). Diffusion of innovation theory. In *Implementation Science* (pp. 59–61). Routledge.

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Tanzania's land policy and women's land tenure security: A case of Moshi District Council

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ABSTRACT

This study examines the impact of Tanzania's 1995 National Land Policy on women's land tenure security in Moshi District, revealing persistent gender disparities despite progressive legal frameworks such as the Land Act No. 4 and Village Land Act No. 5 of 1999. Using a mixed-methods approach, the cross-sectional research design, and informed by feminist theory, data were collected from 266 women through surveys, focus group discussions, and key informant interviews. The results indicate that, although the legal framework promotes gender equity, its implementation is inadequate. Only 18.8% of women pointed out that they had Certificates of Customary Right of Occupancy (CCROs). Younger, less educated, and unmarried women were especially unaware of land policy. Customary norms, limited legal literacy, and inadequate institutional support emerged as major barriers. Binary probit regression analysis indicated that land title ownership, policy awareness, education, and community support positively influence tenure security, whereas customary acquisition and patriarchal traditions undermine it. The study concludes that legal frameworks alone are insufficient to secure women's land rights. Strengthening enforcement, enhancing legal literacy, and advancing institutional reforms are critical policy implications for achieving the objectives of the National Land Policy and promoting gender equity in land tenure.

Keywords: Land Tenure, Land Tenure Security, Tenure Security, Women's Land Tenure Security

I. INTRODUCTION

Land tenure security has been a critical component in realizing gender equality, socio-economic development, and rural transformation (Dancer, 2015). Tanzania's 1995 Land Policy and the Land Act No. 4 and Village Land Act No. 5 of 1999 have been significant in reforming the country's land tenure system, with specific attention to gender equity. These legal instruments aimed to enhance women's rights to access, own, and control land, as an essential resource for livelihoods and empowerment in predominantly agrarian communities (United Republic of Tanzania [URT], 1995).

In Moshi District, as in many other parts of Tanzania, women face significant challenges in accessing and controlling land, even with the ongoing implementation of Tanzania's land policy of 1995, which aims to promote gender equity in land ownership and rights. Generally, traditional customs and socio-cultural norms continue to favour male inheritance and ownership, creating systemic barriers for women. These challenges are further compounded by the interplay of socio-cultural norms, economic factors, and deep-rooted traditions that consistently prioritize male inheritance rights, leaving women with restricted opportunities for property ownership and control (Schmidt & Zakayo, 2018).

Furthermore, despite the Tanzanian government recognizing the importance of addressing gender disparities in land tenure and promoting women's land rights through various initiatives, women's land tenure security remains a major challenge. Women in Moshi district continue to face challenges in securing land rights, due to customary practices, limited access to formal land tenure documents, and weak implementation mechanisms which undermine their land tenure security. Consequently, this has perpetuated gender disparities, thus preventing women from participating in socio-economic development (Schmidt & Zakayo, 2018). Additionally, existing socio-economic factors, cultural norms, and legal ambiguities contribute to a landscape where women's land tenure security is compromised, hence undermining their economic empowerment, social status, and overall well-being.

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Several studies have been conducted on women and land in Moshi District. These include "Women and land ownership rights in Kilimanjaro a tension between women land ownership rights and culture: a case of Moshi rural district (Asantemungu, 2011); Gender issues in irrigated agriculture in Tanzania: a case study of the lower Moshi scheme (Mushi, 2018); Land reform and women's land rights in Tanzania: a case of Moshi rural district: Kilimanjaro region (Balali, 2015); Gender equality in ownership of agricultural land in rural Tanzania: does matrilineal tenure system matter? (Kongela, 2020); Assessing the challenges of women's land rights in Tanzania (Kivaria, 2020), and Socio-economic and cultural practices of land tenure systems on the slopes of Mt. Kilimanjaro, Tanzania from 1920–1950s (Chuhila, 2021).

While previous studies in Moshi District have examined women's land rights, they largely focus on cultural practices, irrigation schemes, and historical tenure systems without systematically analyzing how national land policy reforms intersect with deep-rooted customary norms at the local level. What remains unclear is whether and how the 1995 National Land Policy and its supporting legislation translate into improved tenure security for women in practice, particularly in contexts where patriarchal traditions dominate. This study therefore fills that gap by empirically assessing the implementation of Tanzania's land policy in Moshi District, examining its influence on women's land tenure security, and identifying the socio-cultural and institutional factors that mediate policy outcome.

1.1 Research Objective

To examine the role of Tanzania's land policy on women's land tenure security in Moshi District Council.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Feminist theory

This study was guided by Feminist Theory (FT), which provided a critical lens to analyze gendered disparities in land tenure security by interrogating how patriarchal institutions, socio-cultural norms, and legal frameworks marginalize women in property ownership, inheritance, and governance (Hooks, 2015). The regression results strongly confirm FT's central argument that women's land rights are constrained by systemic barriers. For example, customary norms reduced tenure security by 13% and inheritance practices by 9%, illustrating how rooted patriarchal customs override statutory protections, consistent with Englert and Daley (2008) and Daley and Englert (2010). These findings demonstrate the persistence of institutionalized gender bias that FT critiques, where cultural norms and informal institutions perpetuate women's marginalization despite formal legal guarantees.

At the same time, the study highlights women's agency, another core dimension of FT. Policy awareness increased tenure security by 12% ($p < 0.01$), and education raised it by 9.5%, showing how women actively contest exclusion by leveraging knowledge and literacy to navigate both statutory and customary systems (Behrman *et al.*, 2012; Dancer, 2015). Community support and access to legal aid further strengthened tenure security, underscoring how collective action and institutional engagement enable women to influence land decisions and resist dispossession (Chaara, 2022; United Nations Office on Drugs and Crime. [UNODC], 2020). These results ground FT's conceptualization of women as agents of change within the lived realities of Moshi District, demonstrating that empowerment is materially linked to awareness, documentation, and participation in governance.

Finally, the study extends FT by embedding intersectionality in the analysis. Variables such as marital status, income, and education intersect with gender to shape tenure outcomes, revealing that exclusion is not uniform but compounded by socio-economic positioning. This intersectional grounding enriches FT by situating its critique within locally embedded contexts, showing how structural patriarchy interacts with class and household dynamics to produce differentiated experiences of insecurity (Ortner, 2022)

However, critics argue that FT may essentialize women's experiences, neglect men's role in advancing gender equity, and suffer from fragmentation across paradigms, risking conceptual incoherence (Hawkesworth, 1994; Hanmer & Klugman, 2016). Its application in patriarchal contexts also presents methodological challenges. To address these, this study included male participants in interviews and focus groups to capture broader perspectives, and collected data across multiple wards in Moshi District Council to reduce locational bias and contextualize women's experiences of land tenure insecurity.

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2.2 Empirical Review

A study by the International Food Policy Research Institute (IFPRI) on Gender and Land Tenure in Sub-Saharan Africa: Key Issues and Reform Strategies" highlights that local policies that recognize women's rights to inherit and transfer land can significantly increase their landholdings also highlights that by-laws that require community consultation and participation in land allocation decisions can help ensure that women's voices are heard, and their needs are considered (Peterman, 2011).

For instance, a study in Ethiopia found that a policy reform that granted equal inheritance rights to men and women led to an increase in female-headed households owning land (Holden *et al*., 2009). Another study in India found that a programme providing legal assistance and training to women helped increase their land ownership by up to 5 percentage points (Quisumbing *et al.*, 2013). Deere and Doss (2006) emphasized the significance of securing land rights for women in improving their well-being and economic status. Agarwal (1994) also conducted seminal work on gender disparities in land ownership, highlighting the need for policy reforms to address these inequalities.

The customary land tenure system in Tanzania, as in many other African countries, is traditionally patriarchal, often resulting in women having limited access to and control over land. Different studies have shown that cultural norms and practices significantly influence land ownership and inheritance, typically favouring men over women (Duncan & Li, 2001; Cotula, 2002). Women often acquire land rights through male relatives, making their tenure insecure and dependent on their relationships with men (Lastarria-Cornhiel, 1997). To address these disparities, Tanzania has implemented several legal reforms aimed at enhancing women's land rights. The Land Act of 1999 and the Village Land Act of 1999 are pivotal in this regard, providing a legal framework that recognizes women's rights to own and inherit land (URT, 1999). Despite these national laws, the effectiveness of land tenure security for women often hinges on the implementation of local policy guidelines and by-laws.

Local governments in Tanzania have developed specific guidelines and by-laws to support the national legal framework and address local contexts. Studies suggest that these local policies are important in bridging the gap between national legislation and customary practices. For instance, a study by Knight (2010) highlighted those local by-laws in some districts had been instrumental in promoting women's land rights by explicitly prohibiting discriminatory practices and ensuring women's participation in land governance.

Furthermore, studies indicate that the effectiveness of local by-laws is often hindered by limited awareness and enforcement (Dancer, 2015). Women still face resistance from local leaders and community members who adhere to traditional norms. Additionally, the capacity of local institutions to implement and monitor these by-laws effectively is often constrained by inadequate resources and training.

III. METHODOLOGY

3.1 Description of the Study Area

The study was conducted in Moshi District which is one of the seven administrative districts of Kilimanjaro Region, Tanzania. The district is divided into four divisions and thirty-one wards covering an area of about 1,300 square kilometers (500 sq. mi). The district is bordered by Rombo, Hai, Mwanga, and Simanjiro districts to the north, west, south, and east, respectively. In addition, it also borders Kenya to the east (URT, 2013). Based on Tanzania's 2022 national population and housing census, the district has a population of 535,803 including 273,853 females and 216,950 males, residing in 145,669 households (URT, 2022).

Moshi District was purposefully selected for this study due to its entrenched patrilineal inheritance practices, which often disadvantage women in land ownership, particularly in cases of divorce or widowhood. While such customs are common across Tanzania, Moshi offers a distinctive setting where customary norms intersect with active land policy reforms, including CCRO issuance and NGO-led interventions. It is mix of smallholder farms and large-scale plantations also provides a diverse agricultural landscape to assess how land tenure policies affect women across different economic contexts. Additionally, the district's accessible institutional structures and reliable village registers facilitated effective sampling and data collection, making it a strategically suitable site for this research. Additionally, being close to Mount Kilimanjaro, the area attracts tourism, which influences land use and ownership patterns. Thus, demanding a further understanding of how Tanzania's land policy and the Land Act No. 4 and Village Land Act No. 5 of 1999 affect women, particularly in areas with competing land use interests.

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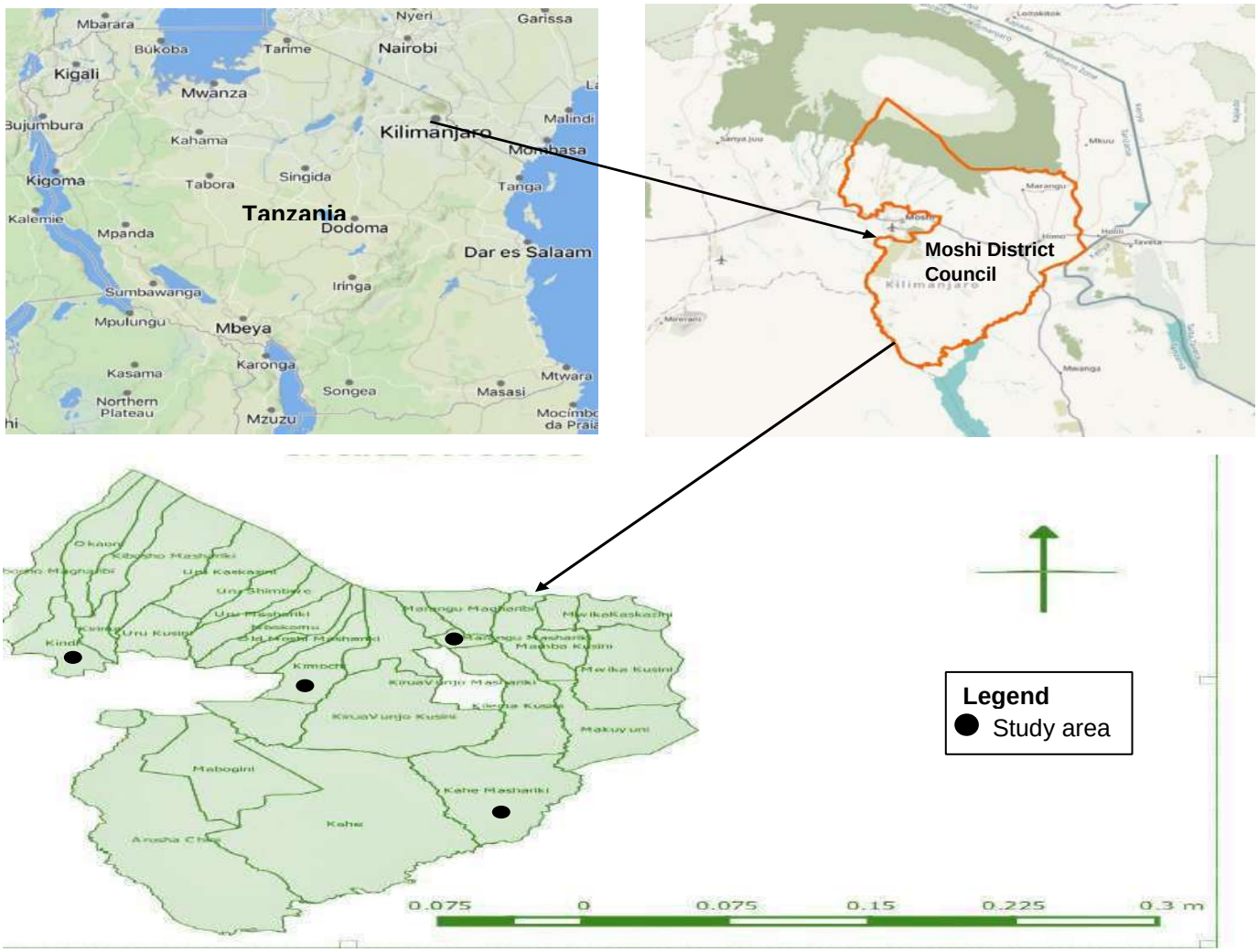

Figure 1
Map of Moshi District Council showing the location of the Study Area

3.2 Sampling, Data Collection, and Sample Size

The study adopted a cross-sectional research design, in which data were collected at a single point in time. This design was selected because it is efficient, time-saving, and provides a snapshot of the current situation. It also allows for comparative analysis, is practical and feasible to implement, and offers useful insights for policy evaluation. In this study, it was particularly appropriate for examining women's land tenure security in Moshi District within the framework of Tanzania's land policy (Hunziker & Blankenagel, 2024).

The study employed a multistage sampling strategy, beginning with purposive selection of Moshi District due to its relevance to the research objectives, followed by probability sampling to enhance representativeness. Using simple random sampling (lottery method), one ward was selected per division, and then one village per selected ward. Within villages, women who own, lease, or use land were randomly chosen from sampling frames drawn from village registers or, where unavailable, developed with community leaders. The sampling unit comprised individual women who are natives or permanent residents of Moshi district through birth, marriage, or long-term employment, including formally employed women residing permanently in the district. Additionally, non-probability purposive sampling was used to recruit key informants such as the district land officer, village land committee chairpersons, and community development officers to provide expert perspectives on women's land tenure security.

The study employed a mixed methods approach, combining quantitative surveys with qualitative Focus Groups Discussion and KIIs to triangulate data on women's land tenure security, usage patterns, access to resources, and related challenges in Moshi District. Primary data consisted of eight focus group discussions (FGDs), two per village, with 6–8 participants each, separated by gender. Secondary data were obtained from the Moshi District land office on land ownership and transactions by gender.

A total of 266 respondents who participated in the study were randomly selected for the survey. The sample size obtained using Cochran's formula for a simple random sample estimating a proportion is:

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$$n_0 = \frac{Z^2\, p(1-p)}{e^2}$$

Where:

$Z = 1.96$ for 95% confidence.

$p = 0.5$ (maximizes variance; conservative choice).

e= desired margin of error $= 0.06$ (±6 percentage points).

n_o=the sample size required;

Therefore

$Z^2 = 1.96^2 = 3.8416$.

$p(1-p) = 0.5 \times 0.5 = 0.25$.

Numerator $= Z^2 \times p(1-p) = 3.8416 \times 0.25 = 0.9604$.

Denominator $= e^2 = 0.06^2 = 0.0036$.

$$n_0 = \frac{0.9604}{0.0036} = 266.777$$

3.3 Data Analysis

IBM- SPSS Statistics windows (version 20.0) was used to analyze the study's quantitative data, whereby both descriptive (frequencies, means, and percentages) and inferential statistics were determined. A Binary probit regression model was used to determine whether women's land tenure security had a significant association with Tanzania's land policy. The dependent variable (Land tenure security) is termed as the assurance that an individual or household has stable, enforceable rights to use, control, and transfer land without fear of arbitrary eviction, dispossession, or dispute. The model's dependent variable was a binary outcome (1 = secure tenure: Indicators (Name on the land title or certificate, legal land ownership documentation, and decision-making power over the land), 0 = insecure tenure: Indicators (Respondent lacked formal/customary recognition or faced credible threats to land access or control). The independent variables included age, education level, household income, marital status, land size, awareness of land laws, mode of land acquisition, possession of land title, customary practices and community norms, access to legal support, community support, and land use. The data collected using the qualitative method were analysed using thematic (content analysis)

The Binary Probit model was expressed as:

$$Y_i = F(X_i\beta) + \varepsilon_i \quad \text{..... (1)}$$

$$Y_i = 1\ if\ secured, 0\ otherwise$$

Where Ɛ~N (0, 1) β-maximum likelihood, i-the cumulative distribution functions of the standard normal distribution. Ɛ-error term,

X1 – i - set of independent variables.

Where Yi = dependent variable, that is the women's land tenure security,

Xi = independent variables (policy implementation, age, Education level, household income, marital status, mode of acquisition, Access to land policy institutions, and land use (farming vs. residential).

The empirical equations are (2) and (3).

$$P_i(0,1) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_n + \varepsilon_i \quad \text{..... (2)}$$

$$P_i(0,1) = \beta_0 + \beta_1 PI + \beta_2 AGE + \beta_3 EDU + \beta_4 HHI + \beta_5 MS + \beta_6 MoA + \beta_7 API + \beta_8 LU + \beta_9 LS + \beta_{10} LT + \beta_{11} CS + \beta_{12} ALS + \beta_{13} CN + \varepsilon_i \quad \text{..... (3)}$$

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Table 1

Summary of Variables Included in the Model

Variable	Unit	Scale	Category	Expected Sign
Women's land tenure security	Dummy 1=secure, 0=Otherwise	Binary	Dependent	
Age	Age of respondent in years	Continuous	Independent	Positive (+)
Education Level	Highest education level attained: None (0), Primary (1), Secondary (2), Tertiary (3), etc.	Ordinal	Independent	Positive (+)
Household Income	Monthly household income (in Tanzanian Shillings)	Categorical	Independent	Positive (+)
Marital Status	1=Single, 2=Married, 3=Divorced 4=Widow	Nominal	Independent	Positive (+)
Land size	Total land size in Ha	Continuous	Independent	Positive/Negative
Awareness of land laws	Awareness of laws:1= Aware, 0= Not aware	Binary	Independent	Positive
Mode of Acquisition	Type of land acquisition: 1= Inherited, 2= Purchased	Categorical	Independent	Positive/ Negative
Land Title	Existence of official land title (Yes=1, No=0)	Binary	Independent	Positive/ Negative
Awareness of land laws	Awareness of laws:1= Aware, 0= Not aware	Binary	Independent	Positive
Customary practices and community norms	Likert scale (1= High negative to 5= High positive)	Ordinal	Independent	Positive/Negative
Access to Legal Support	Whether an individual has access to legal aid (Yes=1, No=0)	Binary	Independent	Positive (+)
Community support	Perception of community support in land claims (Likert scale: Strongly Disagree = 1 to Strongly Agree = 5)	Ordinal	Independent	Positive
Land Use	Primary use of land:1= Farming, 2= Residential 3= Mixed	Binary	Independent	Positive/Negative

NB: Land Use was recoded into a binary variable for regression analysis. Mixed and residential uses (2 and 3) were combined into one category coded as 1 = diversified/non-agricultural use, while purely farming land (1) was coded as 0. This dichotomization reflects theoretical expectations that non-agricultural or diversified land uses may influence tenure security differently from farming-only parcels.

IV. FINDINGS & DISCUSSION

4.1 Socio-Demographic Characteristics of Respondents

The survey findings (Table 2) show that 28.9% of women reported secure land tenure, while 71.1% reported insecure tenure. Age differences were evident: older women (61+) had the highest proportion of secure tenure (40%), while younger women (18–35) were represented in both secure and insecure categories.

Education was positively associated with tenure security: none of the women without formal education reported secure tenure, compared to 26.4% with primary education, 32.3% with secondary, and 33.3% with education beyond secondary school. Marital status showed variation: 30% of married women reported secure tenure, compared to 27% of single women and 37.7% of divorced/widowed women. Household size influenced tenure security, with medium-sized households (5–8 members) reporting the highest proportion (30.5%). Longer residence on land was strongly linked to security: 73.3% of women with over 10 years of residence reported secure tenure. Income differences were pronounced: only 11.6% of women earning below 100,000 TZS reported secure tenure, compared to 81.8% of those earning above 1,000,000 TZS.

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Table 2

Respondents' Socio-Demographic Characteristics and Land Tenure Security

Characteristic		Land tenure secure		Not Land tenure secure	
		Freq.	%	Freq.	%
Surveyed Respondents		**77**	**28.9**	**189**	**71.1**
Age (years)	18 - 35	44	27.7	115	72.3
	36 – 60	29	29.9	68	70.1
	61 and above	4	40.0	6	60.0
Education Level	No formal education	0	0.0	3	100.0
	Primary education	37	26.4	103	73.6
	Secondary education	30	32.3	63	67.7
	Above Secondary school	10	33.3	20	66.3
Marital Status	Single	33	27.0	89	73.0
	Married	39	30.0	91	70.0
	Divorced/Widow	5	37.71	9	64.29
Household size (number)	1 – 4	36	27.5	95	72.5
	5 – 8	39	30.5	89	69.5
	Above 8	2	28.6	5	71.4
Duration of stay (years)	1 – 5	2	50.0	2	50.0
	6 – 10	9	60.0	6	40.0
	Above 10	181	73.3	66	26.7
Income of respondents	Less than 100,000	14	11.6	107	88.4
	100,000 - 499,999	25	25.8	72	74.2
	500,000 - 999,999	29	78.4	8	21.6
	Above 1,000,000	9	81.8	2	19.2

4.1.1 Awareness of Tanzania's Land Policy

Awareness of Tanzania's land policy among women in Moshi District varied by socio-demographic characteristics. Married women, those with secondary or higher education, and women aged 36–60 reported the highest awareness. Women without formal education and widows/divorced women reported lower awareness. Age differences were notable: women aged 36–60 showed the highest awareness, while older women (61+) had the lowest.

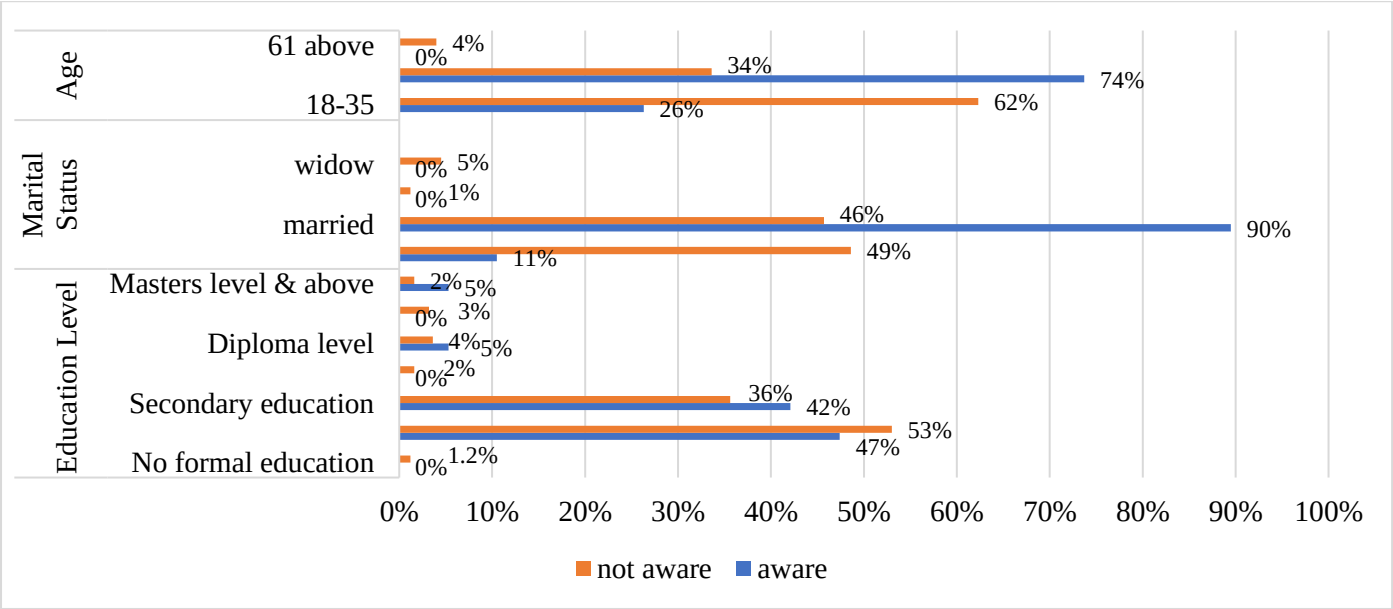

Figure 2

Awareness of Land Policy among Women Based on Age, Education Level, and Marital Status

4.1.2 Ownership of Certificates of Customary Right of Occupancy (CCROs)

Most women (81.2%) did not own CCROs, while 18.8% reported ownership. Age was significant: 8.2% of women aged 18–35 held CCROs, compared with 34% of those aged 36–60 and 40% of those aged 61+. Education showed mixed results: ownership was 33.3% among women with no formal education, 23.6% with primary, 11.5% with secondary, and 18.5% with above secondary education. Marital status influenced ownership: 28.5% of married women reported CCROs, compared to 21.4% of divorced/widowed women and 8.2% of single women.

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Household size mattered: women in medium-sized households (5–8 members) reported higher ownership (22.9%) than those in smaller households (14.5%). No ownership was reported in households with more than eight members. Income was a strong determinant: only 10.3% of women earning below 100,000 TZS owned CCROs, compared to 70% of those earning above 1,000,000 TZS.

Table 3

Ownership of Certificates of Customary Right of Occupancy (n = 266)

Characteristic		Own CCRO		No CCRO	
		Freq.	%	Freq.	%
Overall		50	18.8	216	81.2
Age (years)	18 - 35	13	8.18	146	91.8
	36 - 60	33	34	64	65.97
	61 and above	4	40	6	60
Education Level	No formal education	1	33.3	2	66.67
	Primary education	33	23.57	107	76.43
	Secondary education	11	11.45	85	88.5
	Above secondary school	5	18.52	22	81.48
Marital Status	Single	10	8.19	112	91.8
	Married	37	28.46	93	71.54
	Divorced/Widow	3	21.43	11	78.57
Household size (number)	1 - 4	19	14.5	112	85.5
	5 - 8	31	22.9	104	77
	Above 8	0	0	0	100
Income of respondents	Less than 100,000	14	10.29	122	89.7
	100,000 - 499,999	22	25.28	65	74.7
	500,000 - 999,999	7	21.21	26	78.79
	Above 1,000,000	7	70	3	30

4.1.3 Women's Land Tenure Security as Shaped by Tanzania's Land Policy and Related Factors

The binary probit regression analysis (Table 4) identified several significant predictors of women's land tenure security. Land title ownership was strongly associated with secure tenure ($p < 0.001$), with a marginal effect of 17%, meaning women holding formal land titles were 17 percentage points more likely to enjoy secure tenure. Policy awareness also had a significant positive effect ($p < 0.01$), increasing the probability of secure tenure by 12%. Customary norms, however, reduced tenure security ($p < 0.01$), with a marginal effect of –13%, indicating that women constrained by customary practices were 13 percentage points less likely to have secure tenure.

Education level was another significant factor ($p < 0.05$), raising the likelihood of secure tenure by about 9.5%. Land size owned ($p < 0.01$), community support ($p < 0.01$), and access to legal support ($p < 0.01$) also contributed positively, with marginal effects of 5.5%, 13.7%, and 15.4%, respectively. Land acquired through inheritance showed a significant negative effect ($p < 0.05$), reducing tenure security by 9.2%, while land stay increased tenure security by 8.9% ($p < 0.05$). Other variables such as marital status, income level, age, and land use were not statistically significant.

Table 4

Binary Probit Regression Results Showing Predictors of Women's Land Tenure Security

Variable	Coefficient (β)	Std. Error	z-value	p-value	Marginal Effect
Land Title	0.842	0.215	3.92	0.000**	0.172
Policy Awareness	0.588	0.204	2.88	0.004**	0.121
Customary Norms	-0.634	0.221	-2.87	0.004**	-0.130
Marital Status	0.301	0.198	1.52	0.128	0.061
Education Level	0.465	0.192	2.42	0.015**	0.095
Income Level	0.210	0.188	1.13	0.262	0.043
Land Acquired through inheritance	-0.446	0.225	-1.98	0.048**	-0.092
Land Stay	0.220	0.110	2.00	0.045**	0.089
Age	0.015	0.008	1.88	0.060	0.003
Land Size Owned	0.271	0.090	3.01	0.003**	0.055
Community Support	0.674	0.212	3.18	0.001**	0.137
Land use	0.146	0.204	0.72	0.472	0.028
Access to Legal Support	0.654	0.230	2.84	0.005**	0.154

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4.1.4 Effectiveness of Legal Frameworks

Women's perceptions of legal frameworks varied (Table 5). Nearly half (46.6%) viewed them as "somewhat effective," 24.8% considered them ineffective, 17.7% saw them as very effective, and 10.9% reported indifference.

Table 5

Effectiveness of Legal Frameworks in Protecting and Promoting Women's Land Rights (n = 266)

Effectiveness of land laws and policy	Frequency	Percent
Very effective	47	17.7
Somewhat effective	124	46.6
Not effective	66	24.8
I don't know	29	10.9

4.1.5 Women's Participation in Decision-Making

The study revealed low levels of women's participation in land-related decision-making in Moshi District. As shown in Figure 4, only 14.7% of women reported involvement in such processes while the vast majority of them (85.3%) were excluded.

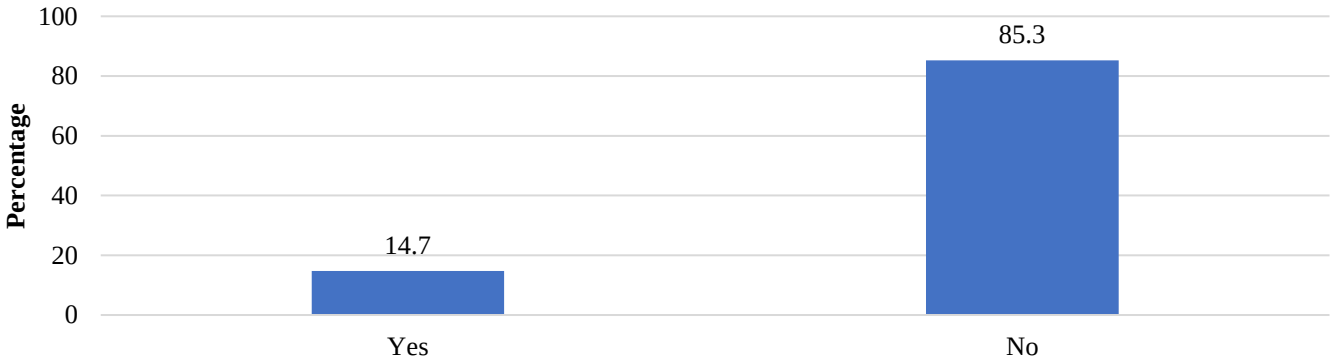

Figure 3

Women's Participation in Land-Related Decision Making

4.1.6 Customary Practices

Findings in Table 6 show that customary practices remain central to land tenure in Moshi District. Nearly half of respondents (48.5%) cited family and clan traditions as the main framework, where patrilineal inheritance excludes daughters under the belief they will access land through marriage. Over a third (37.6%) identified patriarchy as the dominant influence, with men viewed as rightful landowners and household heads, limiting women's ownership and participation in decision-making. Cultural rituals were also reported by 9% of respondents, reflecting the role of spiritual beliefs, taboos, and ancestral obligations in reinforcing male control. Only 4.9% reported no customary influence, suggesting localized shifts toward statutory systems through legal awareness, NGO interventions, or programs such as MKURABITA.

Table 6

Customary Practices among Respondents (n = 266)

Customary practices	Frequency	Percentage
Family and clan tradition	129	48.5
Patriarchy system	100	37.6
Cultural ritual	24	9.0
None	13	4.9

4.1.7 Institutional Support and Implementation Challenges of Land Policies

Institutional support for women's land rights was found to be weak. Most respondents (81.2%) lacked formal ownership documents such as title deeds or Certificates of Customary Rights of Occupancy (CCROs), leaving them vulnerable to disputes and disinheritance. Legal protection was similarly limited, with only 13.9% reporting access to such support. Just under a third (29.3%) indicated benefiting from the legal framework, suggesting that statutory provisions are not widely realized in practice. Training and education on land rights were particularly inadequate, with 87.9% of respondents disagreeing or strongly disagreeing that they had access to such programs, while only 2.6% expressed agreement (Table 7).

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Table 7

Institutional Support and Implementation Challenges of Land Policies (n = 266)

Variable		Frequency	Percent
Access the title deed	Yes	50	18.8
	No	216	81.2
Legal protection	Yes	37	13.9
	No	229	86.1
Benefited from the legal framework	Yes	78	29.3
	No	188	70.7
Training and Education Programs	Strongly Disagree	102	38.3
	Disagree	132	49.6
	Neutral	25	9.4
	Agree	4	1.5
	Strong Agree	3	1.1

4.2 Discussion

The findings highlight several socio-demographic factors shaping women's land tenure security. Age patterns suggest that older women may benefit from accumulated social recognition, while younger women remain vulnerable despite reforms targeting youth and women's rights. Education emerges as a critical enabler, consistent with studies showing that higher educational attainment equips women with knowledge and confidence to navigate land governance systems and assert legal rights (Deininger *et al*., 2017; Doss *et al*., 2018). Marital status findings align with literature noting that widows and divorced women face heightened risks of dispossession under customary systems (Tsikata, 2003; Daley & Englert, 2010; Food and Agriculture Organization [FAO], 2021). Yet, some evidence suggests that formerly married women may enjoy greater autonomy compared to married women (Doss *et al*., 2018). Household size and duration of residence reinforce the importance of social embeddedness in customary tenure systems (Msangi *et al*., 2022). Income disparities underscore the role of economic empowerment in securing land rights, as financial resources enable women to register land, cover legal costs, and resist dispossession.

The findings show that awareness of land policy is uneven, shaped by education, marital status, and age. Women with secondary or higher education reported greater awareness, but FGDs revealed that even educated women often lacked legal literacy. One widowed participant noted:

> *"After my husband died, I lost the land to his family because I did not know that I had any legal rights to it"* (FGD, Sambarai, 18/03/2025).

This supports Dancer and Tsikata (2015), who argue that dissemination of legal information remains inadequate. Marital status also influenced awareness. Married women benefited from joint ownership and household decision-making, while single, divorced, and widowed women were marginalized. A FGD participant stated:

> *"If we give land to women, it is like giving them a double share; land should belong to men first"* (FGD, Sango, 21/03/2025).

Such cultural attitudes reinforce exclusion, echoing Knight (2010). Age differences revealed generational divides. Women aged 36–60 had the highest awareness, reflecting their active role in family and community decisions. Older women (61+) relied more on customary norms, as one participant explained:

> *"When I was young, land matters were always handled according to traditional customs, and no one ever talked about laws that protect women's rights"* (FGD, Rauya, 28/03/2025).

This aligns with Daley and Englert (2010) and Odgaard (2006), who highlight the enduring influence of traditional systems.

CCRO ownership remains low (18.8%), with significant disparities across socio-demographic groups. Age was a strong factor: middle-aged and older women were more likely to hold CCROs, reflecting accumulated assets and familiarity with land governance. This supports Agarwal (1994) and Tsikata (2003), who note that older women often gain tenure security through inheritance or long-term residence. Education showed mixed effects. While awareness increased with education, ownership did not follow the same pattern. Women with primary education reported higher CCRO ownership (23.6%) than those with secondary (11.5%). This suggests that financial and cultural barriers outweigh educational advantages. Marital status shaped ownership patterns. Married women reported the highest CCRO ownership (28.5%), often through joint household investments. Divorced and widowed women showed moderate ownership (21.4%), while single women were most disadvantaged (8.2%). FGDs highlighted that single women face exclusion from inheritance and clan-based allocation, while widows sometimes retain land through their children. Income emerged as the strongest determinant. Women earning above 1,000,000 TZS reported 70% CCRO ownership, compared to just 10.3% among those earning below 100,000 TZS. This highlights the importance of economic

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empowerment in mitigating bureaucratic costs and securing formal documentation, in line with Deininger *et al.*, (2017) and FAO (2021).

The regression results highlight the central role of legal documentation in securing women's land rights. Possession of Certificates of Customary Rights of Occupancy (CCROs) strongly enhanced tenure security, consistent with findings by Agyei-Holmes *et al.* (2023). Awareness of the Village Land Act also mattered, underscoring the importance of legal literacy in empowering women to claim their rights (Dancer, 2015). Policy awareness significantly increases women's land tenure security ($p < 0.01$), with a marginal effect of 12%, meaning women aware of policies are 12 percentage points more likely to have secure tenure. Similarly, access to legal support and possession of land titles substantially improve tenure outcomes, with marginal effects of 15% and 17%, respectively. These results underscore the critical role of statutory frameworks, legal literacy, and institutional outreach in strengthening women's agency. Customary norms, however, undermine statutory protections, reducing tenure security by 13%. This reflects patriarchal practices documented by Englert and Daley (2008), where customary rules override statutory guarantees. Inheritance and clan-based allocations also weakened security, with a negative marginal effect of –9.2%, consistent with Daley and Englert (2010) and Giovarelli *et al.*, (2013). These findings highlight how reliance on customary inheritance exposes women to contested claims and exclusion. Education contributes positively, raising tenure security by 9.5%, suggesting that literacy equips women with the tools to navigate both statutory and customary systems (Behrman *et al.*, 2012). Larger landholdings increased tenure security by 5.5%, encouraging investment in documentation, echoing evidence from Ghana (Nara, 2021). Community support reinforced tenure security by 13.7%, while access to legal aid provided an additional 15.4% increase, aligning with Chaara (2022) and UNODC (2020). Furthermore, land stay had a positive marginal effect of 8.9%, indicating that longer residence strengthens women's social legitimacy. However, as FAO (2018b) notes, residence alone cannot substitute for legal recognition. Non-significant predictors such as marital status, income, age, and land use suggest that tenure security is shaped more by institutional and cultural dynamics than by individual socioeconomic characteristics.

Perceptions of legal frameworks were mixed. Many women acknowledged reforms but noted gaps between statutory rights and customary practices (Knight & Cotula, 2010; Dancer, 2015). NGOs such as Kilimanjaro Women Information Exchange and Communication Organization (KWIECO) and Legal and Human Rights Centre were credited with raising awareness, confirming the role of Civil Society Organizations in empowering women (Daley & Englert, 2010). A quarter of respondents viewed frameworks as ineffective, citing dispossession and weak institutional support, consistent with Manji (2006). Only 17.7% found them very effective, mostly educated or higher-income women (Behrman *et al.*, 2012). FGDs and KIIs revealed that participation requires confidence and legal literacy, not just representation. Indifference reflected gaps in legal literacy, leaving women vulnerable (Doss *et al.*, 2015; FAO, 2018b). Complex legal language and reliance on elders who prioritize customary law further undermined claims (Rwebangira, 1996; Sundet, 2005). These findings emphasize the need for inclusive, accessible, and enforceable land governance to ensure women benefit equally from legal protections

The findings show the gender inequality in land governance in Moshi District, where only 14.7% of women participated in land-related decision-making despite Tanzania's legal requirement of 30%. This exclusion reflects the persistence of patriarchal norms and male-dominated councils that override statutory rights (Dancer, 2015). Given land's role as both livelihood and identity, women's exclusion reinforces broader gender hierarchies and dependency on male relatives (Daley & Englert, 2010). Secure land rights therefore extend beyond ownership to include decision-making authority, as autonomy and access to opportunities remain constrained when women lack voice in governance (Behrman *et al.*, 2012). The persistence of patriarchal structures documented by Rwebangira (1996) and Tsikata (2003) emphasizes that statutory reforms alone are insufficient without cultural transformation.

The results confirm that customary norms continue to override statutory gender-equality provisions, leaving women dependent on male relatives for land security, consistent with Daley and Englert (2010). Patriarchal structures remain engrained, supporting Dancer's (2015) argument that customary institutions undermine statutory protections. The influence of cultural rituals, though less common, demonstrates how spiritual beliefs and ancestral obligations legitimize exclusionary practices (Askew *et al.*, 2013). The small proportion of respondents reporting no customary influence highlights that while legal awareness and NGO interventions are beginning to shift practices, progress remains limited. As FAO (2018b) emphasizes, sustained advocacy, education, and policy enforcement are essential to dismantle discriminatory norms and secure women's land rights.

Institutional support remains weak. The lack of title deeds and limited access to legal protection expose women to disputes and disinheritance, while minimal training and education hinder their ability to claim rights. This gap between statutory guarantees and implementation echoes Askew *et al.*, (2013) and FAO (2018a), who emphasize the importance of institutional outreach. Awareness and education, as noted by Kameri-Mbote (2005), are critical for enabling women to navigate customary systems and assert their rights. Overall, secure land rights extend beyond ownership to include meaningful participation in decision-making. Without stronger institutional support and cultural shifts, women's autonomy and access to opportunities remain constrained, reinforcing broader gender hierarchies (Behrman *et al.*, 2012).

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study assessed the role of Tanzania's 1995 National Land Policy in shaping women's land tenure security in Moshi District. The findings reveal that the majority of women remain insecure in their land rights due to limited legal literacy, engrained patriarchal norms, and systemic barriers in accessing documentation and governance structures. While mechanisms such as Certificates of Customary Right of Occupancy (CCROs) exist, financial constraints, bureaucratic inefficiencies, and underrepresentation in decision-making bodies continue to undermine their effectiveness. Even among middle-aged, educated, and wealthier women, systemic challenges remain widespread, pointing to the structural nature of the problem.

Theoretically, the study advances feminist theory by empirically demonstrating how both formal and informal institutions perpetuate women's marginalization in land governance. It confirms FT's core argument that patriarchal customs override statutory rights, but extends the theory by situating these dynamics within intersectional and locally embedded contexts. By showing how marital status, education, income, and legal awareness intersect to shape tenure outcomes, the study broadens FT's lens beyond gender alone, highlighting the compounded vulnerabilities women face. This intersectional grounding enriches feminist theory by linking structural critique to lived realities in rural Tanzania.

Moreover, the findings underscore that legal reforms alone are insufficient without parallel socio-cultural interventions. Secure tenure depends not only on ownership but also on awareness, institutional support, and community backing. The evidence points to the need for simplifying CCRO acquisition, expanding legal literacy campaigns, enforcing statutory precedence over customary norms, and engaging traditional leaders in reform. By directly connecting regression results to actionable recommendations, the study provides a roadmap for policymakers and civil society to dismantle systemic barriers and strengthen women's autonomy over land.

5.2 Recommendations

Based on the study findings and conclusions the following are recommended: The Ministry of Lands, Housing, and Human Settlement Development should simplify and subsidize the process of obtaining Certificates of Customary Right of Occupancy (CCROs). Regression results showed that land title ownership had the strongest positive marginal effect (17%), significantly increasing women's likelihood of secure tenure. Reducing bureaucratic hurdles, lowering registration fees, and offering free legal aid would make CCROs more accessible, especially for low-income households, thereby directly addressing this gap.

The Government, in collaboration with non-governmental organizations (NGOs), should implement nationwide, culturally sensitive awareness campaigns on land laws and women's land rights. Policy awareness increased tenure security by 12% ($p < 0.01$), underscoring the importance of legal literacy. Campaigns delivered in local languages and through diverse platforms such as radio, community meetings, and religious gatherings should target both women and men to ensure shared understanding and collective support for gender-equitable land rights.

The Moshi District Council should ensure that statutory land laws take precedence over discriminatory customary practices. Customary norms reduced tenure security by 13% ($p < 0.01$), highlighting the need for continuous training of land officers and village leaders on women's rights. Establishing transparent grievance mechanisms and enforcing mandatory quotas for women's representation in land governance structures would counteract these negative effects and guarantee women's active participation in decision-making.

The Government, in collaboration with other stakeholders, should actively engage traditional leaders and elders in bridging the gap between statutory law and customary practices. Inheritance reduced tenure security by 9% ($p < 0.05$), reflecting the vulnerability of women under customary allocation. Continuous dialogue with community leaders, facilitated by civil society organizations, should aim at reforming discriminatory norms. Leaders should be encouraged to mediate disputes in ways that uphold statutory provisions and women's legal rights, serving as a first line of justice before disputes escalate to formal courts.

REFERENCES

Agarwal, B. (1994). *A field of one's own: Gender and land rights in South Asia*. Cambridge University Press.

Agyei-Holmes, A., Frempong, G., & Asante, F. (2023). *The effects of land title registration on tenure security, investment, and allocation of productive resources in Ghana*. World Bank Documents.

Asantemungu, R. E. (2011). *Women and land ownership rights in Kilimanjaro: A tension between women land ownership rights and culture: A case of Moshi Rural District Tanzania* (Master's thesis, Norges teknisk-naturvitenskapelige universitet). https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/250273

Askew, K., Odgaard, R., & Maganga, F. (2013). Of sacred land and customary law: Spiritual beliefs and gendered exclusion in land governance. *Asian Journal of African Studies, 40*, 43–49.

Licensed Under Creative Commons Attribution (CC BY-NC)

Balali, V. T. (2015). *Land reform and women's land rights in Tanzania: A case of Moshi rural district, Kilimanjaro region* (Master's dissertation, University of Dar es Salaam).

Behrman, J. A., Meinzen-Dick, R. S., & Quisumbing, A. R. (2012). The gender implications of large-scale land deals. *Journal of Peasant Studies, 39*(1), 49–79.

Chaara, I. (2022). Access to legal aid and dispute resolution: Implications for justice-seekers. *Journal of Conflict Resolution, 66*(5), 1055–1078. https://doi.org/10.1177/00223433211055633

Chuhila, M. J. (2021). Socio-economic and cultural practices of land tenure systems on the slopes of Mt. Kilimanjaro, Tanzania from 1920–1950s. *Journal of the Geographical Association of Tanzania, 41*(1), 1–18. https://doi.org/10.56279/jgat.v41i1.9

Cotula, L. (Ed.). (2002). *Changes in "customary" land tenure systems in Africa*. International Institute for Environment and Development. https://www.iied.org/sites/default/files/pdfs/migrate/12537IIED.pdf

Daley, E., & Englert, B. (2010). Securing land rights for women: Integrating gender into the land reform process in Tanzania. *Journal of Eastern African Studies, 4*(1), 91–113.

Dancer, H. (2015). *Women, land and justice in Tanzania*. Boydell & Brewer.

Deere, C. D., & Doss, C. R. (2006). Gender and the distribution of wealth in developing countries (No. 2006/115). WIDER Research Paper.

Deininger, K., Ali, D. A., & Alemu, T. (2017). Impacts of land certification on tenure security, investment, and land market participation: Evidence from Ethiopia. *Land Economics, 87*(2), 312–334.

Doss, C., Kovarik, C., Peterman, A., Quisumbing, A., & van den Bold, M. (2015). Gender inequalities in ownership and control of land in Africa: Myths versus reality. *Agricultural Economics, 46*(3), 403–434. https://doi.org/10.1111/agec.12171

Doss, C., Meinzen-Dick, R., & Bomuhangi, A. (2018). Women's land ownership and empowerment: Evidence from Uganda. *Land Use Policy, 76*, 412–421.

Duncan, J., & Li, P. (2001). Women and land tenure in China: A study of women's land rights in Dongfang County, Hainan Province. Rural Development Institute.

Englert, C., & Daley, E. (2008). Securing land rights for women. *Journal of Eastern African Studies, 4*(1), 91–113.

Food and Agriculture Organization of the United Nations. (2018a). *Gender-responsive land titling projects and their impact on women's land tenure security*. Food and Agriculture Organization of the United Nations.

Food and Agriculture Organization of the United Nations. (2018b). *Realizing women's rights to land: A methodological guide*. FAO Regional Office for Asia and the Pacific. https://www.fao.org/documents/card/en/c/I8780EN

Food and Agriculture Organization of the United Nations. (2021). *The status of women in agrifood systems*. Food and Agriculture Organization of the United Nations.

Giovarelli, R., Wamalwa, B., & Hannay, L. (2013). Land tenure, property rights, and gender. USAID Issue Brief.

Hanmer, L., & Klugman, J. (2016). Exploring women's agency and empowerment in developing countries: Where do we stand? *Feminist Economics, 22*(1), 237–263.

Hawkesworth, M. (1994). Policy studies within a feminist framework. *Policy Sciences, 27*(2/3), 97–118.

Holden, S. T., Deininger, K., & Ghebru, H. (2009). Impacts of low-cost land certification on investment and productivity. *American Journal of Agricultural Economics, 91*(2), 359–373.

Hooks, B. (2015). *Feminism is for everybody: Passionate politics*. Routledge.

Hunziker, S., & Blankenagel, M. (2024). *Research design in business and management: A practical guide for students and researchers*. Springer.

Kameri-Mbote, P. (2005). The land has its owners! Gender issues in land tenure under customary law. Paper presented at the UNDP-International Land Coalition Workshop: Land Rights for African Development: From Knowledge to Action, Nairobi, Kenya.

Kivaria, A. K. (2020). *Assessing the challenges of women's land rights in Tanzania* (Unpublished research paper). Ardhi University, School of Spatial Planning and Social Sciences.

Knight, R. (2010). Statutory recognition of customary land rights in Africa: An investigation into best practices for lawmaking and implementation. FAO Legislative Study 105. Food and Agriculture Organization of the United Nations.

Knight, R., & Cotula, L. (2010). Statutory recognition of customary land rights in Africa: An investigation into best practices for lawmaking and implementation. FAO Legislative Study 105. Food and Agriculture Organization of the United Nations.

Kongela, S. (2020). *Gender equality in ownership of agricultural land in rural Tanzania: Does matrilineal tenure system matter?* (Unpublished research paper). Ardhi University, Dar es Salaam, Tanzania.

Lastarria-Cornhiel, S. (1997). Impact of privatization on gender and property rights in Africa. *World Development, 25*(8), 1317–1333. https://doi.org/10.1016/S0305-750X(97)00030-2

Manji, A. (2006). *The politics of land reform in Africa: From communal tenure to free markets*. Zed Books.

Licensed Under Creative Commons Attribution (CC BY-NC)

Msangi, A., Kimaro, T., & Mwakalobo, A. (2022). Sustainable agricultural practices among smallholder farmers in Tanzania. *Journal of Agricultural Development*, *18*(2), 45–60.

Mushi, N. (2018). *Gender issues in irrigated agriculture in Tanzania: A case study of the Lower Moshi scheme* (Unpublished master's thesis). University of Dar es Salaam, Tanzania.

Nara, E. (2021). Customary land rights and tenure security of subsistence farmers in Ghana. [Master's thesis, University of Twente]. https://research.utwente.nl/en/publications/customary-land-rights-and-tenure-security-of-subsistence-farmers

Odgaard, R. (2006). Land rights and land conflicts in Africa: The Tanzania case. Danish Institute for International Studies.

Ortner, S. B. (2022). *Anthropology and social theory: Culture, power, and the acting subject*. Duke University Press.

Peterman, A. (2011). Women's property rights and gendered policies: Implications for women's long-term welfare in rural Tanzania. *Journal of Development Studies*, *47*(1), 1–30.

Quisumbing, A. R., Roy, S., Njuki, J., Tanvin, K., & Waithanji, E. (2013). Can dairy value-chain projects change gender norms in rural Bangladesh? Impacts on assets, gender norms, and time use. IFPRI Discussion Paper 1311. International Food Policy Research Institute. https://www.ifpri.org/publication/can-dairy-value-chain-projects-change-gender-norms-rural-bangladesh

Rwebangira, M. K. (1996). *Women and land rights in Tanzania*. Haki Ardhi.

Schmidt, S., & Zakayo, E. (2018). Land formalization and local leadership in Moshi, Tanzania. *Habitat International*, *74*, 18–26. https://doi.org/10.1016/j.habitatint.2018.03.001

Sundet, G. (2005). The 1999 Land Act and Village Land Act: A technical analysis of the practical implications of the acts. Haki Ardhi.

Tsikata, D. (2003). Securing women's interests within land tenure reforms: Recent debates in Tanzania. *Journal of Agrarian Change*, *3*(1–2), 149–183.

UNODC. (2020). *Toolkit on access to justice for women and girls*. United Nations Office on Drugs and Crime.

URT. (1995). *National Land Policy*. Ministry of Lands, Housing, and Human Settlements Development. United Republic of Tanzania

URT. (1999). *The Land Act, No. 6 of 1999* (pp. 14, 15, 18). Government Printers.

URT. (2013). *Administrative units and boundaries*. Ministry of Lands, Housing, and Human Settlements Development.

URT. (2022). *Population and housing census: National report*. National Bureau of Statistics.

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Challenges faced by headteachers in setting school goals and expectations in basic schools: A case study of Asante Akim North Municipality, Ghana

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ABSTRACT

This study explored leadership barriers to goal framing and setting expectations in public schools in Ghana, focusing on headteachers' experiences and the institutional constraints they face. Public schools in Ghana are frequently characterized by unclear, multiple, or absent goals, hindering effective planning and learner achievement. Headteachers, as key leaders, are responsible for establishing school goals and expectations; however, heavy workloads, diverse stakeholder interests, and systemic constraints present significant challenges. Adopting a phenomenological approach and a qualitative research design, the study utilized purposive maximum variation sampling to capture a broad range of perspectives across junior high, primary, and kindergarten levels in the Asante Akim North Municipality. Schools were stratified by educational level and rural-urban setting, with participants categorized as headteachers, School Improvement Support Officers [SISOs], and lead teachers. From a population of 129 staff across 69 public schools, 23 headteachers, 5 SISOs, and 22 lead teachers were selected. Responses were obtained from 11 headteachers, 4 SISOs, and 10 lead teachers, each with over 15 years of professional experience. Data were gathered via semi-structured questionnaires and interviews. Guided by an interpretive philosophical approach, the responses were transcribed, coded, and analyzed to identify emerging themes. Findings indicated that inadequate coaching and orientation limit teachers' ability to contribute to goal development. Additional challenges included unsustainable government policies, poor dissemination of school mission and vision statements, and difficulties in formulating Specific, Measurable, Achievable, Realistic, and Time-bound (SMART) goals. Financial constraints and limited expertise further undermined effective goal-setting. The study recommends targeted orientation programs on goal-setting policies, as well as workshops and seminars to enhance skills in developing school goals, objectives, mission, and vision statements. Furthermore, regular monitoring should be instituted to ensure that schools set and adhere to realistic, achievable goals.

Keywords: Expectations, Goal-Setting, Headteachers, Instructional Leadership, Leadership

I. INTRODUCTION

Institutions around the world have been working with unclear, vague, or some form of objectives without considering effective ways to use and rely on essential aspects of goals (Palmer & Wehmeyer, 2003a). Learners have the capacity to set achievable goals and use them to meet expectations, with support from diverse educational approaches and models at the school level. Salfi (2011) showed that success was achieved when a headteacher brought to bear a shared mission, vision, and collaborative effort of leadership practices and learning performance. Additionally, Shogren et al. (2024) explained that, in their study, secondary education provides learners with great opportunities to develop skills and abilities that promote self-determination in the school system when clear goals are set. Essential among educational success achievements are goal-setting and goal-attainment skills, which are developed to enhance learners' ability to take responsibility for their own learning activities and future outcomes. Cooney and Cohen (2024) are of the view that, clear goals set in schools positively affects and serves pupils with disabilities (Cooney, 2017). These findings highlight the global importance of goal-setting as a leadership and instructional tool(Cooney & Cohen, 2024; Palmer & Wehmeyer, 2003b; Salfi, 2011; Shogren et al., 2024). As stated by Locke and Latham (2019), the goal-setting theory posits that establishing clear and compelling goals and targets not only enhances focus but also provides a strategy that motivates individuals to work toward their objectives with high competence and self-confidence.

Locke showed that, for an individual to set practical goals, they must first identify and recognize the goal and its objectives, and, further, be willing to commit themselves to the goal until it is achieved. When applied in school settings, this theory has led to notable improvements in students' academic performance (Locke & Latham, 2019). In Kenya, a study demonstrated that goal-setting improved learners' academic performance in secondary schools by fostering independent learning. The study further suggested that these findings could guide policymakers and educational administrators in enhancing academic outputs and adopting new, effective motivational strategies in

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secondary schools (Adede et al., 2025). Similarly, in Nigeria conducted a study that assessed the effects of goal-setting on learners' English performance. The study revealed that learners who were exposed to goal-setting and objectives performed better and advanced their education than those who did not set goals at all. The study also recommended goal-setting as a valuable approach for improving students' academic performance (Abe et al., 2014). Roebken's study in Germany, which examined the relationship between student goal orientation and academic achievement in secondary schools, disclosed that students who actively prioritized learning based on both mastery and achievement goals were more motivated and performed better academically than those who focused solely on mastery goals (Roebken, 2007).

In Kenya, Ong'uti et al. (2019) explored the relationship between goal-setting and mathematics performance among students in Kisii Central Sub-County and found a statistically significant positive correlation between goal-setting and mathematics performance (Ong'uti et al., 2019). The study found that learners who set goals achieved better results than those who did not and recommended that university and college authorities train teachers in goal-setting techniques. Collectively, these studies underscore the significant role goal-setting plays in enhancing learners' academic performance in diverse educational contexts. The clear knowledge gap is the challenge educational leaders face in setting school goals and expectations.

In Ghana, schools face persistent challenges in defining and implementing clear goals and expectations. Research shows that many basic schools lack formal mission and vision statements, or where they exist, orientation and alignment remain weak (Esia-Donkoh, 2014a) . Headteachers often struggle to balance national education policy demands with community and parental expectations, leading to misalignment and resistance to goal-setting. Peculiar challenges that impair the headteacher in setting clear goals and expectations have not been explored or reported. The absence, therefore, leaves a gap in knowledge as to what the next steps should be in addressing the lack and absence of goals and expectations in Ghanaian schools and how Ghanaian headteachers can frame and sustain realistic, well-communicated goals that not only align with national directives but also respond to the unique needs of their school communities

1.1 Statement of the Problem

Ensuring Goal setting and clear expectations in schools provide adequate directions for teaching and learning, and improve school leadership. Research outcomes show that countless schools exist and operate with vague or unsettled goals, and in some cases, there are no prescribed mission and vision statements or set goals and objectives in place (Palmer & Wehmeyer, 2003b). Evidence exists that schools and headteachers who formulate well-defined goals have students who are more engaged and successful, and adopt leadership practices that improve school performance (Muriuki et al., 2022; Salfi, 2011). Despite this information, Ghanaian schools continue to encounter challenges in setting and implementing the set goals and expectations. Studies show that headteachers often struggle to align with national education policies amid diverse stakeholder aspirations (Esia-Donkoh, 2014b). The misalignment leads to conflicting expectations, ambiguous goals, and weak implementation structures in the schools.

Additionally, headteachers face institutional and contextual obstacles, including heavy administrative workloads, inadequate resources, limited professional development, and low teacher motivation (Barrios et al., 2024). Challenges like these not only undermine the effectiveness of establishing clear goals but also hinder the school's monitoring and evaluation processes necessary for proper implementation. Again, socio-economic constraints among students and varying parents' priorities further complicate the process, leaving many schools without coherent or shared direction. As established evidence from some contexts suggests that structures and collaborative goal-setting can positively enhance school performance (Bruhn, et al., 2016), the extent to which Ghanaian headteachers can effectively set and sustain school goals remains uncertain. This study, therefore seeks to investigate the challenges headteachers face in setting and implementing school expectations in Ghanaian basic schools.

1.2 Research Objectives

What are the challenges headteachers face in framing school goals and expectations in rural and urban schools in Asante Akim North Municipality of the Ashanti Region?

II. LITERATURE REVIEW

2.1 Theoretical Review

The theoretical framework underpinning the research was derived from the philosophy of instructional leadership by Hallinger and Murphy. According to Murphy and Hallinger, the Instructional leadership definition considers a framework that puts together various functions, processes, and activities. The key components of instructional leadership, according to Hallinger and Lee (2014) and Murphy (1983), include framing school goals and objectives, developing and promoting high expectations of staff for students, assessing and monitoring students' performances, protecting instructional time, Knowledge of curriculum and instructions, promoting curricular

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instructions, promoting and supporting instructional improvement, and Supervision and evaluation of instruction (Mohamad, 2014). Setting school goals and expectations is a critical component of the philosophy of our current study, seeking to explore the challenges headteachers face in framing the goals and expectations of basic schools. In higher institutions, goals and expectations are clearly defined in developed and developing countries (Esia-Donkoh, 2014b; Martin et al., 2024). There is a sharp decline in the institutional adoption of the concept and its implementation in basic schools in sub-Saharan Africa, where very little is known about the challenges faced by headteachers, who are seen as managers of the institution (Zickafoose et al., 2024).

2.2. Empirical Review

Esia-Donkoh (2014a) examined the duties of headteachers in Ghanaian public basic schools and found that they are pivotal in aligning school goals with national education policies. The study identified challenges, including inadequate instructional resources, low teacher morale, and socio-economic barriers that affect students' ability to meet expectations. Dorado et al. (2024) studied school heads' competency challenges and found that limited professional development opportunities and high administrative workloads hinder effective goal-setting.

These findings are directly applicable to Ghana, where non-instructional duties often consume headteachers' time. Martin et al. (2021) conducted a large-scale study on growth goal-setting in high schools, revealing that instructional support and structured goals positively influenced student engagement (Martin et al., 2021b).While not specific to Ghana, the findings suggest that, with adequate resources and professional support, similar positive outcomes could be achieved in Ghanaian basic schools. Muriuki et al. (2022) investigated Kenyan private primary schools and found that strategic goal-setting, when combined with collaborative planning and monitoring, enhanced academic performance. The parallels with Ghana indicate that structured and inclusive processes could help overcome some contextual challenges (Muriuki et al., 2022).

Finally, Bruhn et al. (2016) conducted a systematic review of goal-setting interventions for students with behavior problems, finding significant improvements in academic and behavioral performance. These insights suggest that integrating behavioral-focused goal-setting approaches could help address student-related barriers to goal attainment in Ghana. School goals and expectations are central to educational planning, guiding teaching, learning, and administrative functions. They outline the intended learning outcomes and set performance standards for students, teachers, and the institution (Smyth, 2020). In basic schools, these goals often encompass academic achievement, moral development, and social skills. However, in Ghana, school goals are shaped by both national education policy requirements and community aspirations, which can sometimes create competing priorities for headteachers (Esia-Donkoh, 2014b). Headteachers are key actors in formulating and implementing school goals, ensuring they align with curriculum requirements and local realities (Tahira, 2020).This role requires balancing administrative duties with instructional leadership, mobilizing stakeholders, and fostering a shared vision.

In Ghana, headteachers are expected to translate broad educational policies into achievable school-level objectives, a process that requires contextual awareness and strategic planning (Esia-Donkoh, 2014b). Goal-setting functions as both an administrative strategy and a motivational tool; therefore, clearly defined, challenging goals can enhance academic engagement and performance(Martin et al., 2021a). Growth goal-setting, in particular, encourages incremental progress and self-improvement. However, implementing such approaches in Ghanaian basic schools is often constrained by limited resources, varying teacher competencies, and inconsistent stakeholder commitment. While goal-setting is critical to school improvement, headteachers encounter multiple barriers. Barrios et al. (2024) identify professional development gaps, bureaucratic demands, and insufficient institutional support as major hindrances. In Ghana, Esia-Donkoh (2014b) points to inadequate teaching and learning resources, low teacher motivation, and socio-economic challenges among students as key obstacles. Conflicting demands from education authorities and community stakeholders can further lead to goal ambiguity and misalignment (Esia-Donkoh, 2014). Parental and community expectations strongly influence school priorities. Parents' and students' aspirations may differ from official curriculum aims, potentially creating tension for school leaders (Smyth, 2020).

In contexts where parents demand quick academic results or prioritize certain subjects, headteachers may struggle to develop balanced and holistic goals. This assessment is particularly challenging in under-resourced schools, where meeting diverse expectations is difficult. International research reinforces the importance of effective goal-setting. In Kenya, Muriuki et al. (2022) found that headteachers' goal-setting strategies significantly affected pupils' academic performance, particularly when goals were collaboratively developed and regularly reviewed. Similarly, Bruhn et al. (2016) highlight that targeted goal-setting interventions can improve both academic and behavioral outcomes, indicating that structured frameworks can help mitigate challenges encountered in diverse educational contexts.

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III. METHODOLOGY

3.1 Methods

The study methodology has been described in a previous related publication (Ansong et al., 2025). The study adopted a qualitative research design, employing semi-structured questionnaires and interviews as the primary data collection tools. Anchored in an interpretive paradigm, the study sought to understand participants' lived experiences and perspectives regarding the phenomenon under investigation (Ansong et al., 2024). This approach enabled the researchers to capture and analyze participants' diverse views across both rural and urban contexts.

3.2 Population

All headteachers (69), SISOs (8), and Lead teachers (52), totalling 129, constituted the study population in the Asante Akyem.

3.3 Sampling Technique

A purposive maximum variation sampling strategy was employed to capture diverse perspectives across JHS, primary, and KG levels. A multistage procedure was applied in which schools were stratified by level, participants were categorized into headteachers, SISOs, and lead teachers, and schools were further classified by rural–urban location. From a population of 129 staff (69 headteachers, 8 SISOs, and 52 lead teachers) across 69 public schools in the Asante Akim North Municipality, 23 headteachers (18%), 5 SISOs (4%), and 22 lead teachers (18%) were selected. Out of the selected participants, (11) headteachers, (4) SISOs) and (10) lead teachers responded. All participants had more than 15 years of professional experience and provided data through semi-structured questionnaires and interviews

3.4 Data Collection and Analysis

Data were collected using semi-structured questionnaires and interviews, which provided both breadth and depth of responses. Questionnaires captured demographic details and broad trends, and participants answered them. The questionnaire was responded to while interviews explored participants' instructional leadership practices and experiences in setting school goals and expectations. All interviews were conducted face-to-face at participants' schools, recorded, and transcribed with the aid of the Otter App, with participants' consent. The interviews were concluded after reaching saturation.

The data were analyzed through a manual, thematic process. Transcripts were coded using short phrases drawn from participants' own words and questionnaire responses. Overlapping codes were reduced, and related codes were clustered under broader themes to form the analytic framework. This process involved two steps: identifying dominant themes and refining codes in relation to those themes, ensuring consistency across participants.

3.5 Ethical Consideration

The primary ethical concern for this study was the confidentiality and privacy of the information. Additionally, autonomy, that is, the choice to participate voluntarily and withdraw, was given to the participants to make individual decisions. The study team ensured that all collected information remained private and confidential. Data was securely stored to prevent leakage and unauthorized dissemination. All participants were given full details about the study and an informed consent form to sign after they were allowed to ask questions. Special permissions to conduct the study were obtained from the Municipal Education Office of Asante Akim North in the Ashanti Region and the Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development (AAMUSTED).

IV. FINDINGS & DISCUSSION

4.1 Findings

Responses from the questionnaires revealed that some teachers lack the necessary coaching and orientation to develop school goals. Aware of the vision and mission statement, identified the challenges. Also, in situations where the vision and mission had been developed, they were not shared among the school community. Difficulty in setting Simple, Measurable, Achievable, Realistic, and Time-bound *(*SMART) goals, mission, and vision statements was also cited as a challenge. Regarding expectations, the predominant factors were financial and the unavailability of the necessary textbooks. The following comments were provided to support the assertion:

USCB2 explained that:

> *Some of the headteachers needed coaching on how to write the goals of the school. The vision and mission statement is not shared among the staff. They cannot provide the needed textbooks for the teachers to use to teach*

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USCC3 added that:

The headteachers need orientation on how to set an achievable goal. The staff does not buy into the vision

USCA1 indicated that:

Few have the challenge of setting SMART goals for their school. Because some did not state SMART goal implementation became a problem for them

RSCD1 highlighted:

The difficulty is in setting realistic and achievable goals within a time frame. Lack of resources. Some teachers have biases against creative students. Lack of adequate funds to organize in-service training for teachers

Furthermore, the headteachers commented on the ambitiousness of the goals, willingness to adhere to the goals, unsustainable government policies, and inadequate teaching and learning material as some of the challenges facing the framing goal, and high expectations of the headteachers. They further pointed out the negative attitude of some teachers and stakeholders. The comments below were provided by headteachers UHSA1, RHSP5D, UHSH8 and RHSN3:

UHSA1 pointed out that:

Setting over-ambitious goals. Reluctance to change and adherence to the goals set. Challenges include financial indiscipline on the part of teachers and learners, and the availability of infrastructure, Difficulty in changing old ways of doing things

RHSP5 further stated that:

The unsustainable government policies that directly affect the set goal of individual schools. Inadequate teaching and learning resources

UHSH8 indicated that:

Goal creation has both external and internal factors. Dynamic and complex environment and improper reward system some of the teachers and stakeholders are not subject to change; this has become a challenge in implementing the goals and objectives of the school

RHSN3 opined that:

Involvement of stakeholders like the teachers, parents, and pupils was not encouraging. Finding clear, realistic, and futuristic purposes for the school

UHSJ10 remarked that:

It was a very new policy to the teachers and was a lot relevant, but knowing it is their own will makes them buy into it

In addition, the study revealed individual differences, a lack of teacher support, and a lack of technical expertise in setting goals. A lead teacher pointed out financial factors and, to some extent, the students' academic ability as challenges in setting high expectations. A lead teacher's opinion was that the headteacher lacked the scholarly capacity to set goals and expectations for the school. The lead teachers noted the comments below:

ULSI9 acknowledged that:

Some of the teachers sometimes do not give their full support to the headteachers due to the concept of individual differences. Financial constraints and limited human resources

ULSF6 expressed that:

Inadequate or a lack of expertise in goal-setting Resources for implementing the goals and objectives are limited

RLSO2 explained that:

Insufficient funds to achieve the goals and a lack of effective communication. Some parents and students were not ready to accept and go by these goals, vision, and mission

Responses from the interview suggested that, in some areas, the teachers have not yet received orientation on the mission and vision statements, and in other areas, they have framed them but haven't been able to abide by them. The comments of the individuals are as follows:

I am a new headteacher, and when I came here, there was no mission or vision statement. When I asked the teachers, they told me that they had not received any orientation on the mission and vision statement **(RHSR7)**

We don't have any vision or mission statement, and have not framed any goals for the school, because we have not received any orientation on it, and we do not know how to go about it

(RHSS8)

Initially, they had a problem, but what we told them was that they should frame it following their vision statement of GES and the mission statement. With that of GES, there were some challenges, but we did our corrections, and it's normal, I may say, hopefully they are abiding by it. They are abiding by it, not 100% **(USCC3)**

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We have because we are a mission school, we were able to frame our mission and vision outside of the church's own, and it was not too difficult **(RHSQ6)**

The results have demonstrated that some of the challenges headteachers face in framing school goals and expectations include parents' inability to participate in goal-setting and instability in students' performance. Some of the interviewees commented that

The school has a vision and mission statement, but as for goals and expectations, we don't have. One of the challenges that we have in framing goals and expectations is the lack of participation of parents **(UHSD4)**

One of the challenges that we envisage in framing goals and expectations is the noninvolvement of parents and students' unstable performance **(ULSF6)**

Another challenge was that, while some schools may have formal vision and mission statements, these statements are often neglected and not effectively communicated to teachers and staff. It was further illustrated by mentioning that if you were to ask a teacher if they know the school's vision, they would struggle to provide even a single word or sentence from it.

What I'm trying to say is that some schools have the vision, all right, they have the mission statement printed, but pasted in the headteacher's office. You ask a teacher. Do you know the school vision? Give me one statement, one sentence, or one line, just one word in your school vision? I did it in my school. You asked them just give me one statement, one word, and he cannot mention it, which means the vision statement is on the headteacher's table. **(RHSU10)**

Table 1

Thematic Analysis of the Challenges in Setting School Goals and Expectations (Questionnaire)

Participant Details	Quotes	Code	Profile of Participants
UHSA1	Setting overly ambitious goals. Reluctance to change and adherence to the goals set. Difficulty in changing old ways of doing things	Ambitious Goal Setting, Resistance to Change	Female head, 6 years' experience age bracket (40–49)
RHSP5	The unsustainable government policies that directly affect the set goal of individual schools	Government Policy Impact	Male head, 11 years' experience age bracket (50–59)
ULSI9	Some of the teachers sometimes do not give their full support to the headteachers due to the concept of individual differences. Financial constraints and limited human resources	Teacher Support, Individual Differences	Male lead teacher, 2 years' experience age bracket (20–29)
ULSF6	Some of the teachers sometimes do not give their full support to the headteachers due to the concept of individual differences. Resources for implementing the goals and objectives are limited	Resource Constraints	Male lead teacher, 4 years' experience age bracket (30–39)
RLSI9	Inadequate or a lack of expertise in goal-setting. Resources for implementing the goals and objectives are limited	Individual Differences	Male lead teacher, 7 years' experience age bracket (30–49)
RLSO2	Insufficient funds to achieve the goals and a lack of effective communication	Challenges in Effective Communication	Female lead teacher, 3 years' experience age bracket (30–39)
RLSO2	Some parents and students were not ready to accept and go by these goals, vision, and mission	Resistance from Parents and Students to Goals, Vision, and Mission	Female lead teacher, 5 years' experience age bracket (30–39)
USCB2	Some of the headteachers needed coaching on how to write the goals of the school. The vision and mission statement is not shared among the staff	Coaching on Goal Writing	Male SISO, 19 years' experience age bracket (50–59)
USCC3	The headteachers need orientation on how to set an achievable goal. The staff does not buy into the vision	Staff Unawareness, Goal-Setting Orientation	Male SISO, 5 years' experience age bracket (39–49)
RSCD1	The difficulty in setting realistic and achievable goals within a time frame	Vision Alignment Lack, Goal Setting Struggles	Male SISO, 7 years' experience age bracket (49–59)

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Table 2

Thematic Analysis of the Challenges in Setting School Goals and Expectations (Interview)

Participant Details	Quotes	Code	Profile of Participants
UHSD4	The school has a vision and a mission statement, but as for goals and expectations, we don't have. One of the challenges that we have in framing goals and expectations is the lack of participation of parents	Absence of Defined Goals and Expectations with Challenges in Implementation	Male head, 2 years' experience age bracket (30–39)
ULSF6	One of the challenges that we face in framing goals and expectations is the noninvolvement of parents and students in the school	Challenges in Framing Goals and Expectations: Parental Participation and Student Performance	Female lead teacher, 3 years' experience age bracket (30–39)
RHSR7	I am a new headteacher, and when I came here, there was no mission or vision statement. When I asked the teachers, they told me that they had not received any orientation on the mission and vision statement	Absence of Mission and Vision Statements with Limited Orientation	Female head, 2 years' experience age bracket (30–39)
RHSQ6	We have, because we are a mission school, we were able to frame our mission and vision outside of the church's own; it was not too difficult	Seamless Alignment of School Mission and Vision with Church Mission	Male head, 13 years' experience age bracket (50–59)
RHSS8	We don't have any vision or mission statement, and have not framed any goals for the school because we have not received any orientation on it, and we do not know how to go about it	Challenges in setting school goals and expectations	Female head, 3 years' experience age bracket (40–49)
USCC3	Initially, they had a problem, but what we told them was that they should frame it following their vision statement of GES, and that of the mission statement, with that of GES. So, there were some challenges, but we did our corrections, and it's normal, I may say. Hopefully, they are abiding by it? They are abiding by it, not 100%	Challenges in setting school goals and expectations	Male SISO, 5 years' experience age bracket (30–49)

4.2 Discussion

This study examined the challenges headteachers face in setting school goals and expectations across rural and urban schools in the Asante Akim North Municipality. The data, drawn from semi-structured questionnaires and interviews with headteachers, lead teachers, and School Improvement Support Officers (SISOs), revealed a consistent pattern of issues that hinder the formulation and implementation of school goals. These issues were categorized into the following major themes, as shown in Tables 1 and 2: ambitious and unclear goals, resource constraints, policy and curriculum instability, limited expertise and orientation, weak stakeholder engagement, and the absence or neglect of mission and vision statements. In schools where goals had been set, many were described as either overly ambitious or too vague. For instance, some schools aimed to achieve high performance standards without considering the lack of resources or time constraints. Others articulated broad aspirations such as "improving academic excellence" without identifying specific targets or strategies. Such goals created challenges in monitoring progress and hindered accountability. Headteachers acknowledged the difficulty in prioritizing goals and aligning them with broader institutional and community needs (Hallinger & Lee, 2014). The lack of mission and vision statements emerged as a significant barrier. While some schools had developed these statements, they were not communicated to teachers and integrated into daily practices. In other schools, especially those in rural areas, such statements were completely absent. Teachers reported that they were not oriented toward any school goals, leaving them without a shared sense of direction. The absence of mission and vision statements undermines not only the school's strategic focus but also its ability to foster a culture of accountability and ownership among staff (Godwyll et al., 2016).

The second dominant theme was the severe resource shortage. Headteachers consistently cited insufficient funding, poor infrastructure, and a lack of teaching and learning materials as obstacles to effective goal setting. Newly established schools were particularly disadvantaged, often operating without adequate classrooms, furniture, or instructional materials. The absence of ICT facilities was noted as a significant setback, given the increasing

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integration of digital learning into national education policies. These deficiencies limited schools' ability to pursue ambitious targets, forcing headteachers to lower expectations or abandon plans altogether (Ellis, 2025). Headteachers also highlighted the destabilizing effect of frequent policy shifts and curriculum reforms. Rapid changes in government directives often disrupted the continuity of school planning (Ansong et al., 2025). For example, new curriculum frameworks were sometimes introduced without adequate preparation, training, or resources, leaving schools uncertain about long-term expectations. Respondents described these changes as "unsustainable," noting that schools often adopted goals in response to directives rather than through deliberate planning. This instability weakened confidence in goal-setting efforts and discouraged innovation at the school level (Shaked, 2021) . Another significant barrier was the lack of expertise among headteachers in formulating effective goals. Respondents indicated that many headteachers had not received systematic training in goal setting and strategic planning. SISOs and lead teachers noted that headteachers often lacked the skills to frame realistic, measurable objectives, instead relying on general aspirations.

The lack of capacity-building opportunities, such as workshops or professional coaching, limited school leaders' ability to apply structured goal-setting frameworks, such as SMART (specific, measurable, achievable, relevant, and time-bound). As a result, school goals were often vague and time-bound (Hallinger & Lee, 2014). Stakeholder participation was also found to be weak. Many headteachers reported limited parental involvement in decision-making and insufficient support from School Management Committees (SMCs) and Parent-Teacher Associations (PTAs). Teachers were often excluded from the process of setting school goals, leading to low ownership and inconsistent implementation. Urban schools reported parental disengagement, while rural schools struggled with a total lack of awareness of school vision and mission statements. This lack of collaboration reduced the collective commitment needed to achieve school objectives (Erasmus et al., 2014).

The findings of this study contrast with earlier research that reported greater effectiveness in school goal setting. For example, Erasmus et al. (2014) observed that headteachers in the Saboba locality formulated concise and measurable goals. Similarly, Hallinger and Lee (2014) and Shaked (2021) emphasized that effective instructional leaders typically frame clear, measurable, and time-bound goals. The divergence in findings suggests that time-bound factors such as resource availability, policy stability, and stakeholder engagement play a critical role in the success of goal-setting practices. At the same time, the results are consistent with Godwyll et al. (2016) who found that Ghanaian headteachers often lack the training and expertise to foster a shared vision among staff. Kennedy-Rogers and Mcclain (2020) further observed that the extensive expectations placed on school leaders requiring them to serve simultaneously as instructional leaders. Again, they discover that, the deficiencies of central office practices were school level goals and strategies. Similarly, Salfi (2011) noted that principals frequently face institutional and contextual constraints that impede the translation of vision into actionable objectives.

The study's findings also align with those of Palmer and Wehmeyer (2003), who found that the ability to set and achieve goals requires structured support, a condition often absent in Ghanaian schools. More recently, Shogren et al. (2024) highlighted the importance of scaffolding self-determination skills, including goal setting, in educational contexts, a gap mirrored in the lack of training for headteachers. Likewise, Cooney and Cohen (2024) emphasized that leadership effectiveness in schools is mediated by leaders' capacity to translate policy into practice, a skill hindered by frequent reforms and resource shortages. Tahira (2020) further stressed that sustainable school improvement depends on aligning institutional goals with contextual realities, underscoring the challenges headteachers face in the Ghanaian setting. Interestingly, some schools in this study demonstrated alignment between their goals and those of external bodies such as religious institutions.

These cases suggest that strong external monitoring and partnerships can help schools overcome some of the challenges of goal framing. The findings underscore several important implications for educational leadership and policy in Ghana. First, the lack of expertise in goal setting calls for targeted professional development for headteachers, lead teachers, and SISOs. Second, the absence of mission and vision statements suggests a need for systemic monitoring to ensure that all schools establish clear goals. Third, the instability of education policies points to the need for greater continuity and consultation in curriculum reforms. Fourth, the resource shortages highlight the importance of equitable funding and infrastructural support, particularly for new schools and those in rural areas. Finally, the weakness of stakeholder engagement emphasizes the need for stronger partnerships between schools, parents, and local communities.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study has shown that headteachers in the Asante Akim North Municipality face significant challenges in setting school goals and expectations. These challenges include the absence of mission and vision statements, inadequate resources, policy instability, limited expertise, weak stakeholder engagement, and overly ambitious or vague goals within the schools. Ensuring the success of every kind of curriculum, the setting of school goals and

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expectations is indispensable. Headteachers' limited expertise in goal setting might affect the implementation of the curriculum. The Ghana Education Service, in collaboration with the Ministry of Education, could organise in-service training, seminars, and workshops for headteachers on setting achievable goals for their schools. Resources should be budgeted to support schools' effort to set goals and expectations to improve daily school management. In conclusion, the study has identified reasons for the challenges Headteachers face in framing school goals and expectations. The reasons were resistance to change and difficulties in adapting to established practice by some teachers, government policies that impact on goals that are not sustainable, and the setting of over-ambitious goals that the school cannot achieve. On the contrary, it was identified that some teachers lack the expertise in setting goals and expectations for the school. Other reasons identified were financial constraints and a lack of resources to aid in the implementation of the goals and expectations

5.2 Recommendation

It is therefore recommended that there should be an orientation on policy for goal setting, and that workshops and seminars be organised on how to set school goals and objectives to address the deficiencies that exist. Monitoring activities should be established to ensure that all schools have achievable goals and objectives and abide by them.

REFERENCES

Abe, I. I., Ilogu, G. C., & Madueke, I. L. (2014). Effects of goal-setting skills on students' academic performance in English language in Enugu, Nigeria. *Journal of New Approaches in Educational Research, 3*(2), 93–99. https://doi.org/10.7821/NAER.3.2.93-99

Ansong, J., Addo-Fordwour, M., Kenney, K. C., & Sarfo, F. K. (2025). Instructional leadership challenges of headteachers: Acquiring knowledge of curriculum and promoting curriculum instruction. *Journal of Education Management & Leadership, 4*(1), 46–57. https://doi.org/10.51317/JEML.V4I1.704

Ansong, J., Kusi, H., Sarfo, F. K., & Addo-Fordjour, M. (2024). An exploratory study of instructional leadership challenges of headteachers: Promoting and supporting instructional improvement, supervising and evaluating instruction (Ghana). *Journal of Education Management & Leadership, 3*(1), 48–62. https://doi.org/10.51317/JEML.V3I1.648

Bruhn, A. L., McDaniel, S. C., Fernando, J., & Troughton, L. (2016). Goal-setting interventions for students with behavior problems: A systematic review. *Behavioral Disorders, 41*(2), 107–121. https://doi.org/10.17988/0198-7429-41.2.107

Adede, A. C., Simatwa, E. M. W., & Were, M. N. (2025). Influence of principal-initiated goal setting strategies on students' academic achievement in public secondary schools in Kenya: A study across secondary schools, Mbita Sub County. *International Journal of Current Science Research and Review, 8*(3). https://doi.org/10.47191/IJCSRR/V8-I3-25

Cooney, J. W., & Cohen, M. I. (2024). Multiple logics of curriculum leadership: How a large public school district manages institutional complexity. *Educational Administration Quarterly, 60*(1), 74–114. https://doi.org/10.1177/0013161X231217987

Cooney, K. M. (2017). *High school teacher attitudes towards students with disabilities in the inclusion setting* (Doctoral dissertation, Fairleigh Dickinson University).

Dorado, J. P., Barrios, M. M., & Lumapenet, H. T. (2024). School heads' challenges in enhancing their competencies. *International Journal of Advance Research and Innovative Ideas in Education, 10*(3), 4218–5225.

Dorado, J. P., Barrios, M. M., & Lumapenet, H. T. (2024). School head's challenges in enhancing their competencies. *International Journal of Advance Research and Innovative Ideas in Education, 10*(3), 4218–4224. http://www.ijariie.com4218

Ellis, G. (2025). Headteachers and the professional standards for teaching and leadership: An evaluation of development and practice [Doctoral dissertation, Cardiff University]. https://orca.cardiff.ac.uk/id/eprint/176296/

Erasmus, K. N.-M., Campbell-Evans, G., & Hackling, M. (2014). A model for effective leadership in disadvantaged rural schools in Ghana. *Leading and Managing, 20*(1), 63–79. https://search.informit.org/doi/10.3316/INFORMIT.426239034137190

Esia-Donkoh, K. (2014). Attaining school and educational goals: Duties of headteachers of public basic schools in Ghana. *Journal of Education and Practice, 5*(1), 64–72.

Godwyll, F., Larson, W., & Ahwıreng, D. (2016). Challenges of head teachers as instructional leaders: A Ghanaian perspective. *Journal of Education and Humanities: Theory and Practice, 2013*(8), 53–74.

Hallinger, P., & Lee, M. (2014). Mapping instructional leadership in Thailand: Has education reform impacted principal practice? *Educational Management Administration & Leadership, 42*(1), 6–29. https://doi.org/10.1177/1741143213502196

Licensed Under Creative Commons Attribution (CC BY-NC)

Hallinger, P., & Murphy, J. (2009). Leadership for the 21st century schools: From instructional leadership to leadership for learning.

Kennedy-Rogers, C., & McClain, P. L. R. (2020). An exploration of central office leadership practices that support and address the academic achievement gap between Black and White students in a suburban high school, 96–110.

Locke, E. A., & Latham, G. P. (2019). The development of goal setting theory: A half century retrospective. *Motivation Science*, *5*(2), 93–105. https://doi.org/10.1037/MOT0000127

Martin, A. J., Burns, E. C., Collie, R. J., Bostwick, K. C. P., Flesken, A., & McCarthy, I. (2021). Growth goal setting in high school: A large-scale study of perceived instructional support, personal background attributes, and engagement outcomes. *Journal of Educational Psychology, 113*(4), 752–771. https://doi.org/10.1037/edu0000682.supp

Martins van Jaarsveld, G., Wong, J., Baars, M., Specht, M., & Paas, F. (2024). Goal setting in higher education: How, why, and when are students prompted to set goals? A systematic review. *Frontiers in Education, 9*, 1511605. https://doi.org/10.3389/feduc.2024.1511605

Mohamad Johdi Salleh, A. (2014). Best practice of framing and communicating school goals among principals of cluster secondary schools towards realization of Malaysian Education Blueprint 2013-2025. *The International Journal of Social Sciences and Humanities Invention, 1*(6), 458–466.

Muriuki, M. P., Kimosop, M., & Gachahi, M. (2022). Headteachers' goal setting strategies and pupils' academic performance in private primary schools in Nyeri and Murang'a counties, Kenya. *International Journal of Social Sciences & Educational Studies*, *9*(4), 1–23. https://doi.org/10.23918/IJSSES.V9I4P1

Murphy, J. (1983). Instructional leadership: A conceptual framework. *Planning and Changing, 14*(3), 137–149.

Ong'uti, C. O., Aloka, P. J. O., & Nyakinda, J. O. (2019). Relationship between goal-setting and mathematics achievement among students in public secondary schools in Kenya. *International Journal of Advanced and Multidisciplinary Social Science, 2019*(1), 7–14. https://doi.org/10.5923/j.jamss.20190501.02

Palmer, S. B., & Wehmeyer, M. L. (2003). Promoting self-determination in early elementary school: Teaching self-regulated problem-solving and goal-setting skills. *Remedial and Special Education, 24*(2), 115–126. https://doi.org/10.1177/07419325030240020601

Roebken, H. (2007). The influence of goal orientation on student satisfaction, academic engagement and achievement. *Electronic Journal of Research in Educational Psychology*, *5*(3), 679–704.

Salfi, N. A. (2011). Successful leadership practices of head teachers for school improvement: Some evidence from Pakistan. *Journal of Educational Administration, 49*(4), 414–432. https://doi.org/10.1108/09578231111146489

Shaked, H. (2021). Instructional leadership in higher education: The case of Israel. *Higher Education Quarterly, 75*(2), 212–226. https://doi.org/10.1111/hequ.12274

Shogren, K. A., Mazzotti, V. L., Hicks, T. A., Raley, S. K., Gerasimova, D., Pace, J. R., Kwiatek, S. M., Fredrick, D., Stewart-Ginsburg, J. H., Chapman, R., & Wysenski, D. (2024). The Goal Setting Challenge App: Impact on transition goal attainment outcomes of students with disabilities. *Career Development and Transition for Exceptional Individuals, 47*(1), 4–18. https://doi.org/10.1177/21651434221146470

Smyth, E. (2020). Shaping educational expectations: The perspectives of 13-year-olds and their parents. *Educational Review, 72*(2), 173–195. https://doi.org/10.1080/00131911.2018.1492518

Tahira, M. (2020). Role of head teacher in the whole school development. *Turkish International Journal of Special Education and Guidance & Counselling*, 9(1). https://www.tijseg.org/index.php/tijseg/article/view/16

Zickafoose, A., Ilesanmi, O., Diaz-Manrique, M., Adeyemi, A. E., Walumbe, B., Strong, R., Wingenbach, G., Rodriguez, M. T., & Dooley, K. (2024). Barriers and challenges affecting quality education (Sustainable Development Goal #4) in Sub-Saharan Africa by 2030. *Sustainability, 16*(7), 2657. https://doi.org/10.3390/su16072657

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Building sustainable workplaces: A systematic review of green human resource management (GHRM) practices and their impact on organisational sustainability

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ABSTRACT

This is a systematic review of a total of eighteen empirical studies, which explore the role of green human resource management (GHRM) practices in organisational sustainability in different sectors and national settings. Using PRISMA 2020 and a protocol registered in PROSPERO (CRD420251229461), the review finds a consistent positive impact of green recruitment, green training, green performance management, and green reward systems on environmental performance, green innovation, and pro-environmental behaviour by employees. The results suggest that a significant number of these relationships are mediated by behavioural mechanisms, specifically green organisational culture, environmental felt responsibility, and green work engagement, while being moderated by leadership style, HR competencies, and contextual factors related to the implementation outcomes. Although the strategic role of GHRM has been strongly supported by empirical evidence, the review notes that the methodology has methodological weaknesses, including cross-sectional designs and the geographic focus of the study in Asia and the Middle East. On the whole, the review shows that GHRM is an important organisational lever to be used in embedding sustainability in workforce systems and offers clear theoretical, practical, and methodological guidelines on how to develop the field. Therefore, it is recommended that Green Human Resource Management (GHRM) practices should be adopted in organisations to improve their performance in increasing sustainability. Policymakers and practitioners should restructure these practices to suit their contextual situations, thereby making the transformation effective in the workplace.

Keywords: Environmental Performance, Green Innovation, Green Human Resource Management (GHRM), Pro-Environmental Behaviour, Sustainability, Sustainable HRM, Organisational Behaviour

1. INTRODUCTION

Green Human Resource Management (GHRM) has become a key strategic tool by which organisations have systematically incorporated the issue of environmental sustainability in their human resource systems. The progressive implementation of green human resource management (GHRM) practices, including environmentally oriented recruitment, training, and performance appraisal, as a means to promote pro-environmental competencies and behavior in employees, is supported by empirical studies (Masri & Jaaron, 2017; Ren et al., 2018). Complementary research has shown that the practices increase the ecological awareness and motivation of employees, which supports the organisational conservation of resources and environmental governance (Saeed et al., 2019). Additional evidence assumes that GHRM is associated with the more sustainable operation culture development based on the integration of ecological goals into the daily operations of individuals and groups (Zaid et al., 2018; Lu et al., 2022). In cases where organisations introduce such efforts, carbon footprints, waste streams, and the development of innovative processes that are environmentally responsible are often lowered (Malik et al., 2020; Kuo et al., 2022). According to scholars, the intersection of HRM and environmental management is an indicator of a paradigm shift, as the traditional functions of HR transform into strategic ones, with the emphasis on sustainability (Ren et al., 2018). The rationale behind it is critical, in that it offers a conceptual framework through which the organisation may have its HR systems as the main tools through which it may improve the performance of the organisation, as well as initiate long-term changes in the workplace.

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Although there has been significant growth in the field, there is still a considerable empirical research gap in the field of GHRM, which is theoretically fragmented and methodological, across geographical and industrial settings. The papers have a great diversity in terms of the focus; some of them focus on the employee-level outcomes, including pro-environmental behaviour, engagement, and environmental responsibility (Saeed et al., 2019; Tran, 2023), whereas others consider the organisational-level measures, such as green innovation, sustainability performance, or green intellectual capital (Aftab et al., 2023; Malik et al., 2020). The heterogeneity of the methods also makes the synthesis more difficult, as the majority of the studies are based on cross-sectional designs, self-reported measurements, or non-random selection processes that limit the ability to make causal inferences and generalise the results (Ahakwa, 2021; Khaskhely, 2022). The contextual bias of research is created by the geographical focus in Asia and the Middle East, and the evidence of Africa is still insufficient, with only a few studies being conducted in Ghana and Kenya (Ahakwa, 2021; Odhiambo, 2024). The theoretical frameworks used in various research differ significantly, as they include the Ability Motivation Opportunity (AMO) model, social exchange theory, and institutional theory, which are frequently not coherently integrated (Ren et al., 2018). These inconsistencies have produced conflicting findings on what GHRM practices have the greatest impact on sustainability outcomes and in what circumstances the impact can be found. The identification of such fragmentation is important because it highlights the need to have a systematic review that can synthesise scattered evidence, establish patterns, and describe the processes through which GHRM practices can be associated with sustainable organisational performance.

Therefore, a systematic review is essential to generate an integrative synthesis of the available empirical evidence and determine the effectiveness of GHRM practices to promote organisational sustainability. Empirical studies show that GHRM has the potential to improve environmental performance through mediating the relationship between the constructs of green innovation, environmental responsibility perception, and collaborative organisational cultures (Aftab et al., 2023; Lu et al., 2022). Additional research proves that contextual moderators such as leadership behaviour, environmental orientation, and organisational values define how much GHRM practices can produce environmental and behavioural results (Tanveer et al., 2024; Veerasamy et al., 2024). As the evidence of emerging economies indicates, the introduction of GHRM depends on the institutional requirements, managerial ideology, and resource limitations, particularly in organisations that belong to the public sector and healthcare (Aljohani et al., 2024; Odhiambo, 2024). The studies carried out in the service and manufacturing industries show that the correlation between GHRM and sustainability is not always linear, but in many cases, it is based on the compatibility of HR practices with the overall sustainability policies of an organisation (Khan et al., 2025; Kuo et al., 2022). Such results indicate that a thorough synthesis is required that will be able to assess the consistency and the strength of such relations in a variety of settings. The reasoning behind such a review is twofold. It helps to find strong evidence, sheds light on theoretical and methodological gaps, and provides a platform to further academic knowledge. It also offers practical recommendations to HR managers who want to adopt effective green strategies.

1.1 Research Objectives

(i) To examine how Green Human Resource Management (GHRM) practices are implemented across different organisational contexts.
(ii) To assess the influence of GHRM practices on organisational sustainability outcomes, including environmental performance and employee pro-environmental behaviour.
(iii) To identify the key enablers and barriers that shape the effective adoption of GHRM practices in diverse industries and regions

II. THEORETICAL REVIEW

The AMO framework offers a pragmatic organising logic of research on Green Human Resource Management (GHRM). Appelbaum et al. (2000) define AMO as a combination of ability of employees, motivation and opportunity that leads to performance. As Ren, Tang, and Jackson (2018) demonstrate, green training is often linked to ability, green rewards to motivation, and participatory practices to opportunity in the GHRM studies. These combined effects are often assessed in empirical studies in GHRM, instead of individual practices (Ren et al., 2018). The AMO approach allows scholars to determine the HR leverages that need to be reinforced to produce environmental results. The importance of this focus lies in the fact that it transforms a wide sustainability agenda into testable HR interventions that can be assessed and compared in various settings.

The Social Exchange Theory explains the reason why employees give back on the organisational investments on sustainability. Blau (2017) maintains that the perceived organisational support generates obligations which are later returned by employees in positive behaviour. In the GHRM research, Saeed et al. (2019) use this conceptual model and discover that employees have a greater pro-environmental behaviour when the organisations train and reward

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them through green training and recognition. According to Lu et al. (2022), responsible leadership makes employees feel more responsible, and hence, their green behaviors in return. Therefore, SET bridges the HR inputs and signals of leadership with voluntary green behaviours. This connection is consequential since a lot of the sustainability results rely on discretional employee effort which cannot be guaranteed by formal policies.

The Resource-Based View considers GHRM as a strategic source of advantage in regards to unique human and intellectual capital. Barney (1991) argues that competitive advantage can be maintained by resources which are valuable, rare, inimitable and non-substitutable. Malik et al. (2020) relate GHRM to green intellectual capital and prove that this capital mediates the correlation between the HR practices and the sustainability outcomes. As demonstrated by Tanveer et al. (2024), HR competencies and perceived environmental orientation are moderating factors in the extent to which organisations transform HR investments into green capabilities. Collectively, the RBV and contingency perspectives can be used to explain the ability of GHRM to produce lasting advantage and the contingency in the nature of its impacts. This combined perspective highlights that companies need to come up with unique green resource and match them to contextual facilitators to achieve sustainable performance.

III. METHODOLOGY

3.1 Search Strategy and Data Sources

The review used an extensive and methodical search strategy to find empirical studies that investigated the Green Human Resource Management (GHRM) and organisational sustainability. The protocol was prospectively registered in PROSPERO (CRD420251229461). As per the PRISMA 2020 requirements, databases containing major bibliographic tools, such as Scopus, PsycINFO, Web of Science, Business Source Complete, Emerald Insight, and ScienceDirect, were searched as suggested by the requirements of multidisciplinary management research (Page et al., 2021). In order to reduce the impact of publication bias, which is a well-known technique in systematic review methodology, further grey literature was obtained using Google Scholar, dissertation archives, and conference proceedings (Higgins et al., 2024). The search combinations used in searching for articles in different databases are as shown in the table below.

Table 1

Combined Boolean Search Strings Used in the Systematic Review

Search Focus	Boolean Search String
A. Broad GHRM and Sustainability	(“green human resource management” OR **GHRM** OR “sustainable HRM” OR “environmental HRM”) AND (“organizational sustainability” OR “environmental performance” OR “sustainable performance”)
B. GHRM Practices and Employee Outcomes	(“green training” OR “green recruitment” OR “green performance appraisal” OR “green compensation”) AND (“employee green behavior” OR “pro-environmental behavior” OR “green engagement”)
C. GHRM and Innovation / Strategic Integration	(“green HRM” OR “sustainable HRM”) AND (“green innovation” OR “environmental innovation” OR “organizational learning”)
D. GHRM with Mediators and Moderators	(“green HR practices” OR **GHRM**) AND (“environmental responsibility” OR “green organizational culture” OR “green leadership” OR “HR competencies”)
E. GHRM in Industry or Organizational Contexts	(“green human resource management” OR “sustainable HR practices”) AND (“manufacturing” OR “healthcare” OR “education” OR “hospitality” OR “public sector”)

Only English-language articles published since 2015 were searched, which means that the author pinpointed the recent advancements in the field of GHRM research and captured the trends that have been mentioned in the most recent reviews (Ren et al., 2018). Forward and backward citation tracking were carried out to make sure that all was complete, which is in line with the best practices in retrieving systematic evidence (Booth et al., 2021). All search terms were a combination of the terms that were associated with GHRM practices, sustainability, environmental performance, and green behaviour of employees. Such a methodological approach is essential because a strict and clear search strategy will increase the credibility and reproducibility of the review.

3.2 Selection Process and Eligibility Criteria

Selection of the studies was done by adhering to a multi-stage screening procedure that considered the predetermined inclusion and exclusion criteria in accordance with the objectives of the review. Two reviewers screened titles, abstracts, and full texts, and disagreements were settled by discussion or using a third reviewer, which is compliant with the systematic review standards (Higgins et al., 2024). The included studies analysed the GHRM practices in organisational contexts and presented empirical results on sustainability-related consequences, thus showing population-intervention-outcome congruence suggested in management and organisational research

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(Tranfield et al., 2003). The research articles were filtered out when they were conceptual articles, editorials, non-organizational, or could not explicitly integrate HRM-based elements of the environment; furthermore, conceptual clarity and methodological applicability were checked. Qualitative and quantitative designs were both acceptable, as the research on GHRM can use different implementation approaches (Ren et al., 2018). The PRISMA flow diagram resulted in 18 studies that were left after the removal of duplicates and the implementation of all inclusion criteria.

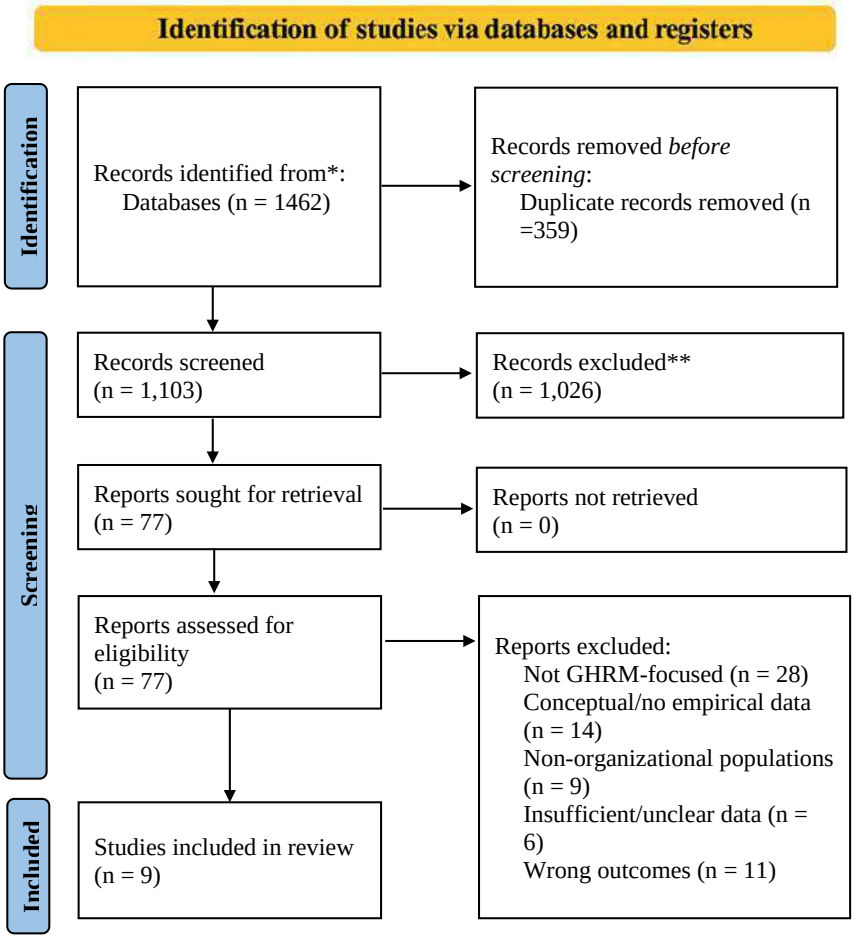

Figure 1
PRISMA Flow Diagram (Team 1)

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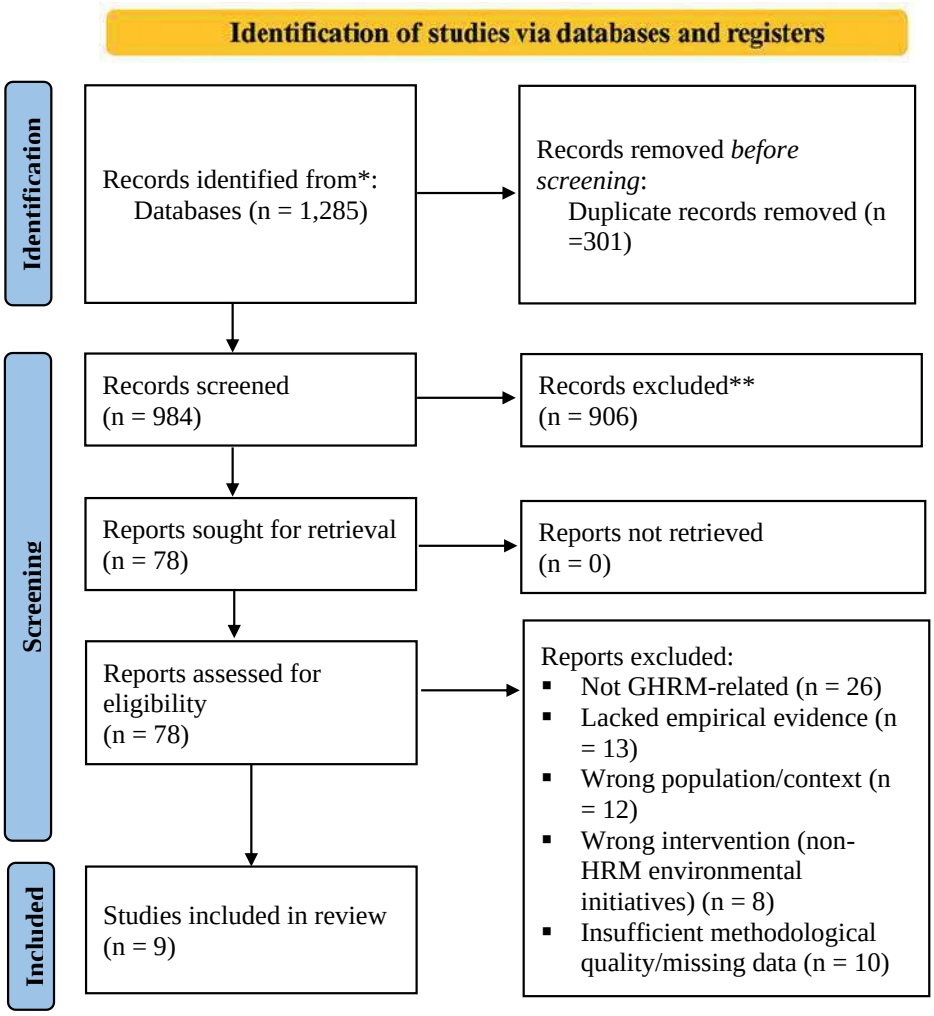

Figure 2
PRISMA Flow Diagram (Team 2)

The reason behind such a strict selection process is the need to make sure that only studies that have methodologically sound and conceptually aligned content are included in the synthesis.

3.3 Quality Assessment

The quality of the methodology and the risk of bias of the included studies were identified with the help of appraisal tools that were valid for their designs. Quantitative studies were evaluated using the Joana Briggs Institute (JBI) Critical Appraisal Checklists to determine the adequacy of sampling, validity of measurement, and transparency of statistical reporting (Aromataris & Munn, 2020). In the case of qualitative research, the Critical Appraisal Skills Programme (CASP) checklist was used, which considered credibility, trustworthiness, and consistency of results (CASP, 2018). The contribution of mixed methods took the aspects of both JBI and CASP to provide a holistic evaluation. The evidence of each outcome was graded by the GRADE approach to quantitative results and GRADE-CERQual to qualitative syntheses, both of which are generally recommended to increase interpretive confidence in systematic reviews (Guyatt et al., 2011; Lewin et al., 2018). All the assessments were conducted by two reviewers who conducted consensus checks to ensure objectivity. This high standard of quality appraisal is the basis of the methodological soundness of the review and explains the strength of evidence that underlines the conclusions.

3.4 Data Extraction and Synthesis

The extraction and synthesis of data were performed on a systematic structure that included attributes of the studies, sample, GHRM practices, quantifiable results, methods of analysis, and significant results. The extraction was conducted by each reviewer to reduce the number of errors and maintain consistency in accordance with the best practice recommendations on improving the reliability of a systematic review (Higgins et al., 2024). The synthesis was based on the narrative design because research designs, outcome measures, and contextual variables are heterogeneous, which is a characteristic of the organizational and HRM scholarship (Booth et al., 2021). Quantitative findings were presented in the form of drawings of the tendencies in the correlations between GHRM practices and

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sustainability outcomes, and qualitative findings were synthesized in the form of themes to determine the recurring concepts and mechanisms. In cases where the studies have indicated mediating or moderating effects, these were coded to improve conceptual knowledge on how and why GHRM affect environmental and organisational outcomes. The lack of similar effect sizes or homogenous measurement tools predetermined the impossibility of conducting a meta-analysis. The method of synthesis is significant since it allows one to achieve a rigorous and conceptually consistent synthesis of a variety of empirical data.

IV. FINDINGS & DISCUSSION

4.1 Characteristics of Included Studies

The last sample included 18 empirical studies, published in 20172025, which represented a heterogeneous mix of organisational settings in manufacturing, hospitality, higher education, healthcare, and small and medium-sized enterprises (SMEs). The majority of the studies were located in the Asian countries, namely China, Pakistan, Malaysia, Saudi Arabia, and Vietnam, and, therefore, reflected the geographic focus that was found earlier in the GHRM scholarship (Ren et al., 2018). There were only two studies that emerged out of the African context, such as Ghana (Ahakwa, 2021) and Kenya (Odhiambo, 2024), which demonstrate the lack of evidence in Sub-Saharan Africa. The most common types of methodological designs used in most of the studies were cross-sectional surveys, but some of them utilised longitudinal, qualitative, or even mixed-method designs. The sizes of samples were quite small, under 100 respondents in qualitative healthcare (Aljohani et al., 2024) and over 600 respondents in the manufacturing and hospitality industries (Khan et al., 2025). Table 1 provides an overview of all studies that were included in terms of their main features. This description is necessary since the recognition of methodological and contextual diversity contributes to the interpretative strength of discovered results and defines the extent of generalizability.

Table 2

Characteristics of Included Studies

Study	Country / Region	Sector	Research Design	Sample Size	Primary GHRM Outcomes Examined
Masri & Jaaron (2017)	Palestine	Manufacturing	Quantitative (Survey)	110	Green HRM practices; environmental performance; operational eco-efficiency
Zaid et al. (2018).	Palestine	Manufacturing	Quantitative (Survey)	220	GHRM and green supply chain practices: environmental, economic, and social sustainability performance
Ren et al. (2018).	Multiple (Review)	Cross-sector	Systematic/Conceptual Review	N/A	Theoretical development of GHRM; research trends; conceptual pathways
Good et al. (2023)	United States	Corporate / Mixed industries	Quantitative (Survey)	250	GHRM impacts on creativity, innovation, and organisational performance
Lu et al. (2022).	China	Corporate	Quantitative (Survey)	403	Responsible leadership; GHRM; environmental felt-responsibility; green employee behaviour
Saeed et al. (2019).	Pakistan	Corporate	Quantitative (Survey)	342	GHRM practices and employee pro-environmental behaviour
Malik et al. (2020).	Pakistan	Corporate	Quantitative (Survey)	300	GHRM; green intellectual capital; organisational sustainability
Tanveer et al. (2024).	Malaysia	Corporate	Quantitative (Survey)	372	Strategic and operational HR competencies; perceived environmental orientation; adoption of GHRM
Mousa & Othman (2020).	Egypt	Healthcare	Conceptual	N/A	Conceptual model linking GHRM to sustainable healthcare performance
Kuo et al. (2022).	Taiwan	Corporate	Quantitative (Survey)	289	GHRM; green innovation; environmental performance outcomes
Khaskhely (2022)	Pakistan	Corporate	Quantitative (Survey)	311	Effects of GHRM on corporate sustainable performance (environmental, economic, social)
Aftab et al. (2023).	Pakistan	Corporate	Quantitative (Survey)	278	GHRM practices; green innovation; green behaviour; environmental performance

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Khan et al. (2025).	China & Pakistan	Hospitality	Quantitative (Survey)	650	GHRM impacts on green innovative work behaviour
Aljohani et al. (2024).	Saudi Arabia	Healthcare	Qualitative (Interviews)	40	Manager perceptions of GHRM: alignment with organisational work values
Veerasamy et al. (2024).	India	Corporate	Quantitative (Survey)	410	GHRM practices and employee green behaviour
Tran (2023)	Vietnam	Corporate	Quantitative (Survey)	357	GHRM; green leadership; green work engagement
Ahakwa (2021)	Ghana	SMEs	Quantitative (Survey)	162	GHRM practices; environmental performance of SMEs
Odhiambo (2024)	Kenya	Higher Education	Quantitative (Survey)	235	GHRM practices: employee pro-environmental behaviour in universities

4.2 Synthesis of Findings

4.2.1 GHRM Practices Implemented

Green Recruitment and Selection: Green recruitment and selection proved to be one of the most widely used GHRM practices, and organisations were beginning to incorporate environmental factors in the hiring process. A number of research works have stated that companies promoted hiring messages with a focus on environmental values, sustainability commitment, and anticipation of eco-friendly behaviour (Masri & Jaaron, 2017; Tanveer et al., 2024). It has been empirically shown that environmentally framed recruitment makes applicants more attracted to the organisation because of their interest in organisational sustainability and more likely to demonstrate green behaviours after recruitment (Veerasamy et al., 2024). Some organisations included environmental competencies assessment during interviews and selection tests (Zaid et al., 2018). These results are consistent with the results of the hospitality industry and manufacturing industry, where the ecological responsibility is promoted as a workforce need (Khan et al., 2025). Green recruitment, therefore, has a background role in the development of an environmentally oriented workforce. This emphasis is consequential as the recruitment of the appropriate talent forms the foundation capacity that is needed to sustain organisational change.

Green Training and Development: Green training and development were always cited as fundamental aspects of GHRM, which focuses on providing employees with the knowledge and sensitisation they require to engage in pro-environmental behaviours. Research has reported systematic training programmes with waste minimization, energy saving, environmental regulations, and sustainability innovation (Saeed et al., 2019; Lu et al., 2022). It has been proven that this type of training improves the level of environmental knowledge among its employees and intensifies their desire to make a contribution to the sustainability of the workplace (Aftab et al., 2023). Other organisations have implemented continuous environmental learning programmes, such as workshops, coaching, and team problem-solving activities (Good et al., 2023). Education was especially important in the context of manufacturing and the state, where performance standards are of high importance (Ahakwa, 2021; Odhiambo, 2024). Green training is thus considered an indispensable behavioural facilitator that enhances the connection between the organisational sustainability agenda and employee behaviour. This practice is relevant in the sense that it helps in making sure that the employees are competent enough to enact green strategies in an effective manner.

Green Performance Appraisal: Green performance appraisal models were extensively reported as a system of strengthening environmental objectives by having systematic appraisal systems. A great number of organisations included environmental requirements in performance appraisals, including adherence to green policies, involvement in sustainability programmes, and contributions to environmental innovation (Masri & Jaaron, 2017; Malik et al., 2020). Studies have shown that employees react well in cases where performance expectations clearly indicate sustainability values and, thus, enhance better alignment of individual roles and organisational ecological goals (Khaskhely, 2022). Managers in a number of studies considered both behavioural and outcome-based measures, such as compliance with recycling procedures, waste minimisation of resources, and environmental improvement proposals (Kuo et al., 2022). Some companies also associated the results of appraisal with promotion or extension of contract, which indicated the strategic role of environmental goals (Aftab et al., 2023). Green performance appraisal is therefore a decisive governance mechanism of institutionalising environmental accountability. It is significant because it influences the expectation of behaviour and strengthens the execution of policy.

Green Compensation and Rewards: Companies have come up with green rewards and compensation systems to encourage employees to be actively involved in sustainability programs. Some companies have introduced financial rewards, reward systems, or promotion opportunities directly connected to the green performance indicators (Zaid et al., 2018; Malik et al., 2020). Empirical data show that monetary and non-monetary green rewards positively affect the motivation of employees, especially in an environment where significant environmental compliance is

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needed (Ahakwa, 2021). Moreover, there are those organizations that promote shared accountability to sustainability performance through the use of team-based reward systems (Saeed et al., 2019). The results of the hospitality and healthcare industries show that symbolic rewards, such as the recognition of eco-friendly behavior in the community, are particularly useful in supporting pro-environmental values (Khan et al., 2025; Aljohani et al., 2024). Green rewards can therefore be used as motivational levers to make sustainability practices adoptable. This mechanism is important as it is able to instill an environmentally responsible culture in organizations.

Employee Green Involvement: Employee involvement practices are used to directly involve workers in sustainability initiatives, decision-making and continuous environmental enhancement initiatives. Green suggestion schemes, environmental committees, and participatory problem-solving sessions are some of the mechanisms that have been reported in various studies (Masri & Jaaron, 2017; Veerasamy et al., 2024). It is proven that engagement increases the level of ownership among employees and leads to environmental citizenship behaviour and collaborative innovation (Saeed et al., 2019; Tran, 2023). Other organisations promoted co-designing green initiatives by the employees, which enhanced the results of implementation by conforming them to the realities of the workplace (Lu et al., 2022). High involvement in a variety of settings, especially the sphere of education and hospitality, was linked to a greater consistency of behaviour and long-term adherence to the green objectives (Odhiambo, 2024; Khan et al., 2025). The participation of employees is therefore observed to be one of the relational sustainability performance drivers. It is significant as it makes the environmental policies shared organisational practices.

4.2.2 Impacts on Organisational Sustainability

Environmental Performance Improvements: Empirical evidence shows that GHRM practices can improve environmental performance greatly through the increased efficiency of resources, a decreased amount of pollution, and the improvement of adherence to environmental regulations. Research in the manufacturing and corporate setting has shown that waste, energy, and carbon emissions have been reduced through the proper implementation of a GHRM system (Masri & Jaaron, 2017; Zaid et al., 2018). Green innovation is one of the key processes in which employees can provide new processes and solutions that are eco-friendly (Kuo et al., 2022). The studies of SMEs note that there are more companies reporting on environmental operations and taking environmental certification (Ahakwa, 2021). Findings in the hospitality and education industries support the existence of similar gains in the reduction of ecological footprint (Khan et al., 2025; Odhiambo, 2024). The results highlight the fact that environmental performance is one of the key measures of sustainable development and the operational impact of GHRM.

Employee Engagement and Green Behaviour: GHRM practices have strong positive outcomes on employee engagement, environmental commitment, and pro-environmental behaviour. Green training, environmental engagement prospects, and supportive leadership can improve the willingness of employees to develop eco-friendly behaviours both within and beyond the work environment (Saeed et al., 2019; Tran, 2023). Empirical research also notes that when employees feel a good GHRM system, they have a greater level of green work engagement, a feeling of responsibility, and voluntary environmental citizenship (Lu et al., 2022; Veerasamy et al., 2024). Employees in hospitality and service sectors are more likely to become motivated to participate in green activities when rewarded or recognised for their effort (Khan et al., 2025). Similar trends are found in public and healthcare institutions, which suggests cross-sectoral uniformity of behavioural results (Aljohani et al., 2024; Odhiambo, 2024). Therefore, employee engagement gives a behavioural premise that is required to sustain organisations.

Organisational Sustainable Performance: The practices of human resource management are directly linked to a better performance of organisations in terms of environmental, social, and economic sustainability. Empirical research shows that companies that have properly developed GHRM systems can attain greater degrees of sustainable competitiveness and sustainably high performance in the long term (Malik et al., 2020). GHRM practices also contribute to organisational reputation and stakeholder trust, which is one of the most important aspects in sustainable branding of firms (Zaid et al., 2018). The experience of multinational and service-oriented organisations has shown that sustainability-oriented HR practices can help organisations to be resilient in terms of their operations and strategic alignment to global sustainability goals (Good et al., 2023). In the case of public sector and tertiary institutions, the same improvement of institutional sustainability outcomes is reported (Odhiambo, 2024). On that note, sustainable performance is a manifestation of the combined effect of environmental, social, and organisational systems.

Innovation and Organisational Learning: Some of the studies reveal that GHRM practices promote green innovation and enhancement of the organisational learning capacity. It has been evidenced that green training and employee engagement make employees creative and innovative in their approach to environmental issues (Good et al., 2023; Kuo et al., 2022). Companies that integrate GHRM and effective leadership endorse greater rates of innovation, work behaviour, and cross-functional cooperation (Khan et al., 2025). Other companies consider environmental learning as a part of continuous professional development programmes and, thus, develop long-term innovation capabilities (Tanveer et al., 2024). The innovation pathways brought about by GHRM are especially useful to

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manufacturing and technology-driven organisations (Aftab et al., 2023). This means that innovation is a key facilitator of sustainability change.

Corporate Reputation and Employer Branding: The GHRM practices have a positive impact on corporate reputation as they indicate seriousness to the environment and ethical leadership. Researchers discover that green recruitment messages and sustainability branding help organisations to attract applicants and customers who are green (Veerasamy et al., 2024; Tanveer et al., 2024). It is also demonstrated that well-developed GHRM systems help in terms of external legitimacy and enhanced corporate image, particularly in the competitive service sector (Good et al., 2023). It is advantageous to healthcare and other institutions of the public as it leads to increased trust in stakeholders and accountability (Aljohani et al., 2024; Odhiambo, 2024). Companies that have strong GHRM practices also record higher attractiveness and retention rates by employers, especially the younger workforce, who are more focused on sustainability. Thus, sustainability efforts increase the strategic value of reputation and branding.

4.3 Mediators and Moderators

Environmental Responsibility: Environmental responsibility comes out as a mediator that explains the influence of GHRM on employee behaviour and the sustainability of the organisation. The research proves that green training, green leadership, and environmentally oriented performance systems make employees feel more accountable to the ecological performance of the organisation (Lu et al., 2022; Tran, 2023). Responsible employees will also tend to pursue voluntary green behaviours and innovation (Saeed et al., 2019). It has been shown that responsibility acts as a mental connection between organisational demands and action by the employee (Veerasamy et al., 2024). The impact is especially high in the environments where the leadership continuously demonstrates environmental stewardship (Lu et al., 2022). Thus, responsibility explains the motivation processes of behaviour change.

Green Innovation: Another mediator that has been reported often between GHRM and sustainability outcomes is green innovation. Researchers determine that the GHRM practices and especially the green training and participation are associated with the increased capacity of employees to develop new environmental solutions (Kuo et al., 2022; Aftab et al., 2023). New recycling systems, digital monitoring tools, waste-reduction processes, and energy-saving initiatives are innovations. It is proven that innovative behaviours are beneficial to environmental performance and contribute to sustainable organisational competitiveness (Good et al., 2023). Strengthened effects of innovation are recorded in organisations that promote experimentation and cross-functional team functions (Khan et al., 2025). As a result, innovation is the working mechanism through which GHRM is translated into a form of sustainability enhancement.

Green Work Engagement: Another mediator that comes up in various studies is the green work engagement. GHRM practices are demonstrated to elevate the enthusiasm, attention, and psychological engagement of the employees in environmental activities (Tran, 2023). Involved employees show increased degrees of commitment to the environmental initiatives and long-term engagement in green programmes (Veerasamy et al., 2024). It is also indicated that leadership behaviours that model environmental values are also associated with the enhancement of engagement (Lu et al., 2022). Engaged employees in a hospitality and services setting will have increased chances to develop green routines and will have chances to influence others to do the same (Khan et al., 2025). In this way, the involvement enhances behavioural consistency and the involvement of sustainability in the long term.

Leadership and Organisational Values: The leadership style and organisational values have been widely reported as moderating factors that affect the scale of GHRM results. The empirical research shows that the effect of GHRM on green behaviour becomes more pronounced through responsible leadership as it contributes to the development of positive and ethically-based workplaces (Lu et al., 2022). Sustainability-focused organisational values also help to increase the rate of acceptance of green practices by employees and strengthen behavioural expectations (Veerasamy et al., 2024). The studies conducted in the healthcare and the general population have proven the invaluable nature of value alignment that allows employees to internalise the environmental goals (Aljohani et al., 2024; Odhiambo, 2024). Moreover, employee engagement has been found to be driven by the leadership's interest in green initiatives and innovation (Aftab et al., 2023). These findings highlight the significance of organisational characteristics in the attainment of GHRM results in firms with heterogeneous rates of performance.

Environmental Orientation and Industry Context: The nexus between GHRM and sustainability outcomes is also influenced by the environmental orientation and industry context. The analysis demonstrates the presence of proportionally greater effects in those industries where regulatory oversight is increased, such as manufacturing, healthcare, and hospitality (Masri & Jaaron, 2017; Khan et al., 2025). Companies with a high strategic environmental orientation are more effective in the operationalisation of GHRM practices in their daily operations (Tanveer et al., 2024). In addition, strong innovativeness reactions to GHRM interventions can be observed in organisations that are located in environmentally sensitive places (Kuo et al., 2022). On the other hand, organisations that have a lower environmental orientation have attenuated behavioural responses to GHRM programmes (Ahakwa, 2021). Contextual moderators are, therefore, a determining factor in the effectiveness and scalability of GHRM practices.

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4.4. Discussion

4.4.1 Overall Interpretation

The results of this review show that GHRM practices are always effective in improving the sustainability of organisations by increasing employee engagement, environmental responsibility, and green behavioural outcomes in various sectors and nationalities. Quantitative studies indicate that green recruitment, green training, and green performance appraisal have a significant positive effect on environmental performance indicators and sustainability indicators, as shown in manufacturing-related research carried out in Palestine and Pakistan (Masri & Jaaron, 2017; Zaid et al., 2018; Malik et al., 2020). Other studies also note that there are good correlations between GHRM and employee-level outcomes, especially pro-environmental behaviour, green innovation, and green work engagement, which supports the behavioural pathways of how HR practices facilitate more general sustainability agendas (Saeed et al., 2019; Tran, 2023; Khan et al., 2025). There is also qualitative evidence to indicate that the perception of the managers and the organisational values determine the intensity of the GHRM implementation, particularly in the context of the public sector and healthcare, where the cultural and institutional factors are high (Aljohani et al., 2024). Even though research differs in the methodological design and the scope of the sector coverage, the fact that 18 empirical sources draw similar conclusions allows us to interpret the fact that GHRM is a powerful organisational lever to sustainability-oriented change. The significance of this interpretation is that it shows that HR systems are strategic and not peripheral in supporting the sustainability agendas in modern organisations.

4.4.2 Theoretical Implications

The findings of this review offer a number of theoretical contributions to the growing body of GHRM research, especially through reinforcing the theoretical foundations of the behavioural and strategic HRM theories on sustainability outcomes. Several studies implicitly use the social exchange theory by demonstrating that workers are returning green organisational practices by increasing the extent of environmental commitment, innovativeness, and behavioural involvement (Saeed et al., 2019; Veerasamy et al., 2024). This trend indicates that the GHRM practices are the indicators of organisational support, and the employees respond to it by engaging in pro-environmental behaviours. Ability motivation opportunity (AMO) theory is used by other studies to find out how green training, incentives, and participatory mechanisms develop the competencies and motivation required to make environmental performance improvements (Good et al., 2023; Aftab et al., 2023). The uniformity of these results supports the theoretical assumption that HR practices constitute a behavioural infrastructure with the help of which the organisational sustainability goals are achieved. Such theoretical implications are important as they narrow down the current behavioural models as well as give evidence-based directions on the routes of linking HR interventions to sustainability results.

Another theoretical implication of the existing GHRM frameworks highlighted in the review is the significance of leadership and organisational context, particularly responsible leadership and environmental responsibility. Research indicates that leadership behaviours are key upstream facilitators of GHRM effectiveness through the influence they have on employee perceptions of environmental priorities and organisational legitimacy (Lu et al., 2022; Tran, 2023). Moreover, cross-country data have indicated that institutional settings, cultural values, and the specifics of sectors have an impact on the consideration and perceived performance of GHRM practices, which requires more context-specific theoretical advancement (Khaskhely et al., 2022; Odhiambo, 2024). These contextual differences indicate the utility of contingency theory in describing why GHRM can be more completely integrated in certain settings than in others. Also, conceptual work suggests the necessity of combining resource-based views and sustainability perspectives to comprehend how the green intellectual capital is a contributor to the long-term competitive advantage (Malik et al., 2020). The significance of these contributions to the research is that they expand the conceptual map of the GHRM studies and outline multi-level processes that should be further empirically investigated.

4.4.3 Practical Implications

The review has a number of practical consequences for HR practitioners and organisational leaders in need of entrenching sustainability in their workforce systems. First, organisations are encouraged to invest in organised green recruitment and training programmes since such practices were always linked with increased employee competence, environmental awareness, and readiness to embrace green behaviours (Masri & Jaaron, 2017; Ahakwa, 2021). Second, sustainability can be a fundamental part of organisational performance management, as the behavioural expectations can be reinforced by implementing environmental metrics into the performance appraisal systems (Zaid et al., 2018; Veerasamy et al., 2024). It is also indicated in evidence that reward systems that recognise environmental contributions are beneficial to the organisation, especially when the employees feel that the reward systems are fair and consistent with organisational values. These practical implications are important since they help organisations to convert sustainability intentions into quantified and integrated HR practices.

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Leadership development and employee engagement also come out as key priorities for organisations that want to implement GHRM effectively. Research demonstrates that responsible leadership behaviours stimulate the internalisation of environmental objectives by the employees and their initiative in implementing green work practices (Lu et al., 2022; Tran, 2023). Moreover, the development of the green organisation culture in healthcare, educational, and hospitality organisations is a priority, and managerial perceptions and sectoral standards determine the extent to which the employees will view sustainability as part of their working responsibilities (Aljohani et al., 2024; Odhiambo, 2024). The practitioners are urged to incorporate GHRM values in wider corporate sustainability policies to ensure that HR systems are in sync with structural and operational environment policies. These lessons are significant since they offer a guide to organisations that intend to institutionalise sustainability using consolidated HR and leadership initiatives.

Despite the evidence on the importance of GHRM that is emerging as shown in this review, the research gaps are also enormous, which makes the field immature. One of the key gaps relates to the fact that all the studies were mostly cross-sectional surveys, which limits the ability to conclude causality and long-term effects of sustainability (Good et al., 2023; Kuo et al., 2022). The African contexts beyond Ghana and Kenya have little research, even though there is growing interest in sustainability in those geographic areas, resulting in a geographical imbalance in the publication of the evidence (Ahakwa, 2021; Odhiambo, 2024). Moreover, the relationship between GHRM and the organisational systems, including supply chain management, leadership pipelines, and digital transformation, is not well-investigated even though the interest in the integrated sustainability approach grows (Zaid et al., 2018; Malik et al., 2020). More effort is also required to demarcate conceptual lines between GHRM and corporate environmental policies and more general ESG frameworks. These gaps should be addressed as they will enhance the empirical and theoretical bases of the GHRM research.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This systematic review summarises the evidence of eighteen empirical studies and proves that green human resource management (GHRM) practices make a crucial contribution to the enhancement of organisational sustainability in terms of the impact on employee behaviour, enhancement of organisational capabilities, and the reinforcement of environmental values in various contexts. The results are always positive in the relations between GHRM activities and the results, including environmental performance, green innovation, and employee engagement, even though the contextual forces and leadership influence the extent of such impacts. Theoretical works prefigure the applicability of behavioural, contingency, and resource-based views in explaining the GHRM processes, and practical knowledge highlights the need to have HR-based interventions that institutionalise environmental behaviours. Despite these advantages, the discipline is still limited by methodological shortcomings and biased geographical representativeness, thus pointing to future multination, longitudinal, and mixed-method studies. Comprehensively, the review confirms that GHRM is a crucial strategic instrument for organisations that aim at establishing sustainable workplaces and react positively to global environmental factors.

5.2 Recommendations

Based on the results in this review, organisations are highly advised to formalise the practises of Green Human Resource Management (GHRM) in their human resource and sustainability core systems. This kind of integration is likely to boost the performance of the environment, support employee engagement, and encourage innovation. In particular, structured green recruitment procedures, special environmental training courses, performance appraisal systems that are adjusted to sustainability goals, and incentive systems that encourage pro-environmental behaviours are promoted. The leadership development programmes must be more focused on responsible and environmentally friendly leadership to reinforce the organisational culture and align employees with sustainability objectives. Moreover, policymakers and HR experts need to reflect on the context-specific changes in GHRM practices, as they must be aware that sectoral, cultural, and institutional differences affect their efficiency. These variables will make GHRM interventions more relevant and effective in various organisational environments. Further studies should be encouraged to make it possible to develop longitudinal and multi-country research that could yield causal data on the long-term effects of GHRM. This type of scholarship will guide both theory and practice, hence promoting the construction of sustainable workplaces.

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REFERENCES

Aftab, J., Abid, N., Cucari, N., & Savastano, M. (2023). Green human resource management and environmental performance: The role of green innovation and environmental strategy in a developing country. *Business Strategy and the Environment, 32*(4), 1782–1798. https://onlinelibrary.wiley.com/doi/pdf/10.1002/bse.3219

Ahakwa, I., Yang, J., Tackie, E. A., & Asamany, M. (2021). Green human resource management practices and environmental performance in Ghana: The role of green innovation. *SEISENSE Journal of Management, 4*(4), 100–119. https://journal.seisense.com/index.php/jom/article/view/704

Aljohani, H. B., Al-Salami, S. L. M. A., Al-Thalabi, F. M. S., Alharrbiy, A. R. R., Alhartomi, I. A. A., Alrahmani, A. H. M., & Almalki, N. S. (2024). The perceptions of healthcare managers on green human resource management practices and their relationship to work values in Saudi Arabia. *Journal of International Crisis and Risk Communication Research, 7*(S6), 1535. https://search.proquest.com/openview/934dd81e91d8e7d63b60e945f1d81638/1?pq-origsite=gscholar&cbl=6480378

Appelbaum, E., Bailey, T., Berg, P., & Kalleberg, A. L. (2000). *Manufacturing advantage: Why high-performance work systems pay off*. Cornell University Press. https://books.google.com/books?id=WqfG1HDc3fsC

Aromataris, E., & Munn, Z. (Eds.). (2020). *JBI manual for evidence synthesis*. Joanna Briggs Institute. https://jbi-globalwiki.refined.site/download/attachments/355599504/JBI%20Manual%20for%20Evidence%20Synthesis%202024.pdf

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. http://diglib.globalcollege.edu.et:8080/xmlui/bitstream/handle/123456789/704/00483.pdf?sequence=1&isAllowed=y

Blau, P. M. (2017). *Exchange and power in social life*. Routledge. https://www.taylorfrancis.com/books/mono/10.4324/9780203792643/exchange-power-social-life-peter-blau

Booth, A., Martyn-St James, M., Clowes, M., & Sutton, A. (2021). *Systematic approaches to a successful literature review* (1st ed.). SAGE Publications Ltd. https://digital.casalini.it/9781529759648

Critical Appraisal Skills Programme. (2018). *CASP qualitative checklist*. https://casp-uk.net/casp-tools-checklists/qualitative-studies-checklist/

Good, J. R., Singh, P., & Ezzedeen, S. (2023). Environmental sustainability strategy, creativity, innovation and organizational performance: The role of green human resource management. *American Business Review, 26*(2), 10. https://digitalcommons.newhaven.edu/cgi/viewcontent.cgi?article=2222&context=americanbusinessreview

Guyatt, G., Oxman, A. D., Akl, E. A., Kunz, R., Vist, G., Brozek, J., Norris, S., Falck-Ytter, Y., Glasziou, P., DeBeer, H., Jaeschke, R., Rind, D., Meerpohl, J., Dahm, P., & Schünemann, H. J. (2011). GRADE guidelines: 1. Introduction-GRADE evidence profiles and summary of findings tables. *Journal of Clinical Epidemiology, 64*(4), 383–394. https://doi.org/10.1016/j.jclinepi.2010.04.026

Higgins, J. P. T., Thomas, J., Chandler, J., Cumpston, M., Li, T., Page, M. J., & Welch, V. A. (Eds.). (2024). *Cochrane handbook for systematic reviews of interventions* (Version 6.5). Cochrane. https://training.cochrane.org/handbook/current

Khan, K., Gogia, E. H., Shao, Z., Rehman, M. Z., & Ullah, A. (2025). The impact of green HRM practices on green innovative work behaviour: Empirical evidence from the hospitality sector of China and Pakistan. *BMC Psychology, 13*(1), 96. https://link.springer.com/content/pdf/10.1186/s40359-025-02417-5.pdf

Khaskhely, M. K., Qazi, S. W., Khan, N. R., Hashmi, T., & Chang, A. A. R. (2022). Understanding the impact of green human resource management practices and dynamic sustainable capabilities on corporate sustainable performance: Evidence from the manufacturing sector. *Frontiers in Psychology, 13*, 844488. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.844488/pdf

Kuo, Y. K., Khan, T. I., Islam, S. U., Abdullah, F. Z., Pradana, M., & Kaewsaeng-On, R. (2022). Impact of green HRM practices on environmental performance: The mediating role of green innovation. *Frontiers in Psychology, 13*, 916723. https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.916723/pdf

Lewin, S., Booth, A., Glenton, C., Munthe-Kaas, H., Rashidian, A., Wainwright, M., ... & Noyes, J. (2018). Applying GRADE-CERQual to qualitative evidence synthesis findings: Introduction to the series. *Implementation Science, 13*(Suppl 1), 2. https://link.springer.com/content/pdf/10.1186/s13012-017-0688-3.pdf

Lu, H., Xu, W., Cai, S., Yang, F., & Chen, Q. (2022). Does top management team responsible leadership help employees go green? The role of green human resource management and environmental felt-responsibility. *Corporate Social Responsibility and Environmental Management, 29*(4), 843–859. https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.2239

Licensed Under Creative Commons Attribution (CC BY-NC)

Malik, S. Y., Cao, Y., Mughal, Y. H., Kundi, G. M., Mughal, M. H., & Ramayah, T. (2020). Pathways towards sustainability in organizations: Empirical evidence on the role of green human resource management practices and green intellectual capital. *Sustainability, 12*(8), 3228. https://www.mdpi.com/2071-1050/12/8/3228

Masri, H. A., & Jaaron, A. A. (2017). Assessing green human resources management practices in Palestinian manufacturing context: An empirical study. *Journal of Cleaner Production, 143*, 474–489. https://www.sciencedirect.com/science/article/pii/S0959652616321515

Mousa, S. K., & Othman, M. (2020). The impact of green human resource management practices on sustainable performance in healthcare organisations: A conceptual framework. *Journal of Cleaner Production, 243*, 118595. https://www.sciencedirect.com/science/article/pii/S0959652619334651

Odhiambo, G. M. (2024). Green human resource management practices and employee pro-environmental behaviour in public universities in Kenya (Doctoral dissertation, Jomo Kenyatta University of Agriculture and Technology). http://ir.jkuat.ac.ke/bitstream/handle/123456789/6525/Grace%20Odhiambo%20PhD%20%20Thesis%202024.pdf?sequence=1&isAllowed=y

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., ... Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ, 372*, n71. https://doi.org/10.1136/bmj.n71

Ren, S., Tang, G., & Jackson, S. E. (2018). Green human resource management research in emergence: A review and future directions. *Asia Pacific Journal of Management, 35*(3), 769–803.

Saeed, B. B., Afsar, B., Hafeez, S., Khan, I., Tahir, M., & Afridi, M. A. (2019). Promoting employee's proenvironmental behavior through green human resource management practices. *Corporate Social Responsibility and Environmental Management, 26*(2), 424–438. https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.1694

Tanveer, M. I., Yusliza, M. Y., Fawehinmi, O., & Ngah, A. H. (2024). Examining the strategic and operation HR competencies as enablers of green human resource management practices: Mediating role of perceived environmental orientation. *The International Journal of Human Resource Management, 35*(19), 3305–3339. https://www.tandfonline.com/doi/abs/10.1080/09585192.2024.2403542

Tran, N. K. H. (2023). An empirical investigation on the impact of green human resources management and green leadership on green work engagement. *Heliyon, 9*(11), e08226.

Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management, 14*(3), 207–222.

Veerasamy, U., Joseph, M. S., & Parayitam, S. (2024). Green human resource management practices and employee green behavior. *Journal of Environmental Planning and Management, 67*(12), 2810–2836.

Zaid, A. A., Jaaron, A. A., & Bon, A. T. (2018). The impact of green human resource management and green supply chain management practices on sustainable performance: An empirical study. *Journal of Cleaner Production, 204*, 965–979.

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Regional disparities in SDGs achievement across Africa: An analysis using SDG dashboards

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ABSTRACT

Africa's progress towards achieving the Sustainable Development Goals (SDGs) remains highly uneven, with persistent regional disparities undermining the continent's collective advancement toward Agenda 2030. Despite ongoing national and regional efforts, there is little comparative evidence showing exactly how each SDG performance differs between African regions, hindering targeted policy interventions. This study examines regional disparities in the achievement of Sustainable Development Goals (SDGs) across Africa, utilizing the SDG Dashboards from the 2025 Sustainable Development Report Database. The study was grounded in the Sustainable Development Theory, which posits that disparities in SDG achievement across African regions stem from imbalances among the economic, social, and environmental pillars, which ultimately disrupt overall SDG countries' dashboards' performance. Data from 54 African countries were analyzed through descriptive statistics, the Kruskal-Wallis test, and post-hoc comparisons by Dunn's pairwise comparison test with Bonferroni correction to assess inter-regional variations. The results demonstrate statistically significant differences across 12 SDGs, with Northern Africa consistently outperforming other regions. Eastern and Western Africa show different results. They are making some progress on SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action), but not on SDG 1 (No Poverty), SDG 3 (Good Health and Well-being), and SDG 11 (Sustainable Cities and Communities). Central and Southern Africa display markedly lower achievement across most goals. These findings indicate that Africa's progress toward Agenda 2030 remains uneven and structurally fragmented, with persistent challenges in SDGs 1, 2, 3, 6, 7, 9, 11, 14, and 16. The observed disparities in SDG achievement across African regions are structurally determined, reflecting variations in economic capacity, governance, infrastructure, and institutional capacity. The progress is relatively stronger in Northern Africa. Eastern and Western Africa demonstrate mixed outcomes, while Southern and Central Africa lag behind, highlighting the necessity of strengthening regional knowledge-sharing, mobilizing targeted resources, and enhancing institutional capacity to reduce disparities and accelerate sustainable development across the continent.

Keywords: Africa, Regional Disparities, SDG Dashboard, Sustainable Development Goals

I. INTRODUCTION

The Sustainable Development Goals (SDGs) were launched in 2015 by the United Nations as a global initiative aimed at eradicating poverty, safeguarding the environment, and promoting peace and prosperity for all by 2030 (Sorooshian, 2024; Ghosh & Chakravarty, 2024). The SDGs consist of 17 goals and 169 targets to address the world's most pressing development challenges (Confraria *et al.*, 2024). These SGDs succeeded the Millennium Development Goals, marking a significant evolution in the global development agenda (United Nations, 2023). Since their adoption, substantial efforts have been made to understand and implement the SDGs through strategic initiatives and development programs for their attainment (Bain *et al.*, 2019; Chapman *et al.*, 2020).

The development of these effective initiatives relies on understanding the progress and the level of achievements through intensive monitoring and evaluation (Viegas *et al.*, 2021). Monitoring focuses on assessing the progress towards the goals, while evaluation observes whether progress is efficient, effective, equitable, and relevant (Lucks & D'Errico, 2016; De Francesco *et al.*, 2024). Evaluation provides evidence as to how and why results are or are not being achieved, which is crucial for designing policies and implementing programs (Lucks, 2021; De Francesco *et al.*, 2024). Given that the 2030 Agenda for Sustainable Development has been in effect for some time, it is appropriate to conduct a mid-term evaluation to assess the effectiveness of the established goals and determine the need for potential revisions (Sorooshian, 2024).

Focusing on the framework of the 2030 Agenda, governments and researchers are currently measuring and monitoring the progress toward SDGs at different geographical scales, using different indicators and composite methods (Bie *et al.*, 2023). To assess global progress, the SDGs are tracked using a set of 231 unique indicators aligned with 169 targets (Estoque, 2020). Among the key visualization tools that support this assessment are the SDG index score, SDG

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Dashboard, and SDG Trend (Sachs *et al.*, 2025). The SDG Index and Dashboards provide an annual assessment of SDG progress in all 193 UN member states, building a peer-reviewed, statistically audited, and transparent methodology (Schmidt-Traub *et al*., 2017; Lafortune *et al*., 2018). According to the UN, the SDG Dashboard provides a color-coded snapshot of a country's status on each goal: green (achieved), yellow (challenges remain), orange (significant challenges), and red (major challenges remain). The SDG Dashboard captures threshold-based outcome status, making it suitable for identifying structural divergence patterns across regions.

According to the UN General Assembly (2024), only 17% of SDG targets are currently on track globally, with nearly half showing minimal or moderate progress, and over one-third having stalled or regressed. In Africa, the situation is considerably more concerning, with less than 6% of SDG targets on track for achievement by 2030 (African Union Commission *et al.*, 2024). The attainment of SDGs is critical for Africa's sustainable development, as these goals provide a structured framework to address the continent's most pressing social, economic, and environmental challenges while upholding the principle of "leave no one behind" (Bie et al., 2023). Achieving these goals requires coordinated efforts among a wide range of stakeholders, including civil society, research institutions, governmental and non-governmental organizations, the private sector, and academic institutions (Lorren *et al*., 2019; Bolaji & Oluwaseun, 2022)

Previous research has contributed valuable insights into SDG progress, but with notable limitations. For instance, Sachs *et al*. (2022) provided assessments at the country level but did not systematically compare SDG attainment across African regions. Similarly, Mlambo and Niyitunga (2024) focused on three goals: SDG 1, SDG 2, and SDG 5 across Nigeria, Kenya, and South Africa. Despite these contributions, a significant gap remains in the literature for comprehensive, comparative regional analyses of SDG achievement across the African continent.

This study addresses this gap by employing the SDG dashboards as a standardized tool to evaluate and compare progress across all 17 SDGs in African regions. By utilizing dashboard indicators, the research moves beyond single-country analyses or selective SDG studies, offering a holistic perspective on regional disparities in SDG attainment. This provides a diagnostic mapping of how SDG achievement differs systematically across African regions, as regional aggregation is meaningful due to African regions sharing institutional histories, economic structures, policy coordination mechanisms, and ecological conditions that shape development trajectories beyond national borders.

Hence, this approach enables the identification of areas where specific regions perform strongly or lag behind, thereby providing a nuanced understanding of the continent's development challenges and opportunities. Ultimately, this study contributes to the empirical literature by offering a systematic, region-level assessment of SDG achievement in Africa, which can inform targeted policy interventions and resource allocation to accelerate progress toward Agenda 2030.

1.1 Statement of the Problem

The achievement of the SDGs has varied significantly across African countries (Sachs *et al*., 2024). This disparity raises critical questions about the underlying economic, social, and environmental factors influencing SDGs progress across the continent. Numerous studies have examined progress toward achieving the SDGs and focused primarily on individual regions or countries, yet a comprehensive comparative analysis of the assessment level of SDGs attainment among African countries remains largely overlooked. Wernecke *et al.* (2021) assessed SDGs progress in four low-income, rural villages in South Africa, while Van de Ven *et al.* (2019) focused on evaluating and improving policies in Eastern Africa to achieve multiple SDGs simultaneously. Additionally, Kasirye et al. (2020) explored the implementation status of SDGs in sub-Saharan Africa, concentrating on SDG 4, SDG 7, and SDG 8, but did not account for other African regions, particularly non-sub-Saharan countries, and the broader determinants of SDGs achievements.

This knowledge gap highlights the need for a comprehensive assessment of regional disparities in SDG attainment across Africa using the SDG Dashboard. Understanding these variations is critical for identifying regions that are progressing versus those facing persistent challenges. Insights derived from the Dashboard allow policymakers and stakeholders to benchmark performance, track progress, and prioritize interventions in lagging regions. With the 2030 SDG deadline approaching, such timely evaluation is essential for guiding evidence-based decisions, promoting equitable progress, and ensuring that no region is left behind in the collective effort toward achieving the SDGs.

1.2 Research Objective

Compare the levels of SDGs achievement among African regions based on the dashboards.

1.3 Research Hypothesis

$H0_1$: There are no significant differences in SDG achievement levels among African regions across the examined SDGs

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II. LITERATURE REVIEW

2.1 Theoretical Review

This study is grounded in the Sustainable Development Theory (SDT), which provides a multidimensional framework for understanding the interconnections between economic growth, social inclusion, and environmental protection. Initially advanced by the United Nations and elaborated in the Brundtland Report of 1987, SDT defines sustainable development as meeting present needs without compromising the capacity of future generations to meet their own (World Commission on Environment and Development [WCED], 1987). The theory has since been widely adopted and developed by scholars and policymakers as a conceptual lens for analyzing development outcomes holistically and integratively (Zahedi, 2019; Shi *et al.*, 2019).

SDT emphasizes that progress in one dimension of development is intrinsically linked to outcomes in others, highlighting the need for equilibrium across economic, social, and environmental pillars. In the African context, uneven prioritization of these pillars has often resulted in imbalances, constraining sustainable development and the achievement of the Sustainable Development Goals (SDGs). This theoretical perspective underscores that measuring SDG attainment requires an integrated approach that accounts for these multidimensional interactions, rather than isolated progress in individual goals.

By applying SDT to the analysis of the SDG Dashboard, this study conceptualizes the continent's regional disparities in SDG performance as reflections of systemic imbalances in sustainable development. The SDG Dashboard provides a composite measure of progress across multiple dimensions, allowing for an assessment of how African countries and regions are aligning economic, social, and environmental outcomes with the principles of sustainability. In this way, SDT not only frames the rationale for examining differential SDG attainment but also informs the interpretation of observed regional variations, highlighting where structural inequities may hinder holistic progress toward Agenda 2030. Furthermore, SDT's emphasis on multi-level stakeholder engagement supports the study's relevance for policy interventions, suggesting that targeted regional strategies informed by Dashboard insights can promote more balanced and inclusive sustainable development across Africa.

2.2 Empirical Review

Several studies have examined SDGs attainment in Africa, albeit with limitations in scope and methodological breadth. Mlambo and Niyitunga (2024) assessed SDG progress in Nigeria, Kenya, and South Africa, focusing on SDG 1, SDG 2, and SDG 5. Using a qualitative approach grounded in secondary data and literature review, their study highlighted persistent challenges, including poverty, political instability, gender inequality, and youth unemployment that constrain SDG achievement. However, the study's narrow focus on three countries and three goals limited its capacity to provide a comprehensive understanding of SDG attainment across the African continent.

Similarly, Ammari *et al.* (2022) conducted a national-level evaluation of Morocco's SDG performance, analyzing SDG 1, SDG 2, SDG 3, SDG 4, SDG 5, SDG 6, SDG 7, SDG 8, SDG 9, SDG 10, SDG 11, SDG 12, and SDG 13 using data from 2001 to 2018. Employing a composite index methodology, the study provided a robust framework for tracking SDG progress at the national level. Nevertheless, its single-country focus restricted the generalizability of findings to broader African contexts, and it did not examine variations in SDG attainment across multiple countries or regions.

In a broader regional context, Osman *et al.* (2022) applied spatial analysis to explore synergies and trade-offs among African SDGs between 2016 and 2020, using exploratory and inferential spatial statistics. Their findings indicated that high-performing SDG hotspots were concentrated in North Africa, while Central and Eastern Africa exhibited notable cold spots. Although this study offered valuable insights into regional patterns of SDG performance, it primarily emphasized spatial variation without providing a systematic comparative analysis of SDG attainment across the continent.

Collectively, these studies underscore that while important insights into African SDG progress exist, empirical research has largely been constrained to specific countries, selected SDGs, or spatial patterns. This highlights a critical knowledge gap that the present study seeks to address. By leveraging the SDG Dashboard data to conduct a continent-wide analysis of all 17 SDGs, this research provides a holistic assessment of SDG attainment across African regions. In doing so, it not only documents regional disparities but also offers actionable insights for policymakers and development partners to design targeted interventions and promote balanced progress toward Agenda 2030.

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III. METHODOLOGY

3.1 Research Design

This study employs a quantitative research design to assess the levels of SDGs achievements using the Dashboards among African regions. The approach is comparative and explanatory, using both descriptive and inferential statistical methods to assess differences in SDGs achievement

3.2 Data Sources

The data used in this study were obtained from the Sustainable Development Report 2025 database, which provides comprehensive and up-to-date information on SDG performance for all 193 UN member states. The database contained overall results for all countries, including the index score, goal dashboard, and trend for all 17 goals, Codebook showing the list of indicators, bounds, and thresholds, Full database, indicating the data for all countries; includes spill over score, raw values, normalized scores, dashboard ratings, trends & goal scores. The dataset was accessed in Excel format and imported into SPSS for analysis. Specifically, this study utilized data on the SDGs Dashboards, which provide visual and categorical representations of the current status for each goal. Only countries from the African continent were retained for the purpose of this regional comparison, with a baseline of the SDG dashboard in the year 2025 as the recent year.

Prior to analysis, data cleaning and pre-processing procedures were undertaken to ensure data integrity. The dataset was first examined for missing values, inconsistencies, and potential entry errors. Where missing values occurred, they were verified using the official Sustainable Development Report (SDR) online repository to ensure accuracy and comparability. Missing values were then replaced using weighted mean imputation, where the weights were derived from regional averages to preserve proportional representation among the five African regions. This approach minimized potential bias in regional comparisons while maintaining the internal consistency of the dataset.

Additionally, all variables were screened for outliers and data anomalies. No extreme outliers were detected that warranted exclusion. Beyond the recoding of the SDG Dashboard variable into numerical form (Green = 4, Yellow = 3, Orange = 2, Red = 1) for statistical analysis, no further transformations were performed. This ensured that the analysis remained aligned with the original structure and methodology of the Sustainable Development Report while maintaining robustness for cross-regional comparison

3.3 Data Analysis

3.3.1 Regional Grouping for Sampled Countries

For this study, only countries from the African continent were retained from the Sustainable Development Report 2025 database. The African continent comprises 54 countries, which served as the sample for the statistical analysis. These countries were grouped according to their respective regions**,** following standard regional classifications commonly used by the United Nations and the African Union due to the comparability and policy relevance, and also their groupings are based on the geographical, economic, and historical characteristics of the countries. The regional breakdown is shown in Table 1:

Table 1

Classification of African Countries by Region for SDG Analysis

REGION	COUNTRY
Northern Africa	Algeria, Morocco, Libya, Tunisia, Egypt, and Sudan
Eastern Africa	South Sudan, Ethiopia, Kenya, Tanzania, Mozambique, Zambia, Somalia, Rwanda, Malawi, Seychelles, Eritrea, Djibouti, Comoros, Mauritius, Madagascar, Uganda, Burundi, and Zimbabwe
Central Africa	Chad, Cameroon, Central African Republic, Equatorial Guinea, Sao Tome and Principe, Gabon, Congo, Democratic Republic of Congo, Angola, and Congo
Western Africa	Burkina Faso, Benin, Togo, Ghana, Ivory Coast, Liberia, Sierra Leone, Guinea, Guinea-Bissau, Senegal, Nigeria, Niger, Mali, Mauritania, Cape Verde, and Gambia
Southern Africa	Namibia, Botswana, South Africa, Eswatini, and Lesotho

3.3.2 Variable Description

The SDG dashboard was utilized as one of the key variables in assessing the level of progress made by countries in achieving SDGs. According to the Sustainable Development Report of 2024, the dashboard serves as a visual tool that summarizes a country's performance across all 17 SDGs (Table 2), through a traffic light colour scheme: green, yellow, orange, and red. Each colour represents a specific performance level, offering an intuitive understanding of how far a country is from meeting its SDG targets. According to Lafortune *et al.* (2018), Green signifies that the goal has been achieved**,** indicating that the country has reached or surpassed the established green threshold for the corresponding

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indicator(s). Yellow indicates that challenges remain, where performance lies below the green threshold but above the red threshold, meaning there is limited progress, but the goal has not been achieved.

Orange denotes the presence of significant challenges, meaning the country is closer to the red threshold and still far from meeting the target, reflecting high obstacles limiting the achievement. Red reflects major challenges, implying that the country is at or below the red threshold and substantially behind the target, highlighting that both the selected indicators are performing the worst. The SDG dashboard methodology assumes equal weighting across indicators and relies heavily on the availability and quality of data. Furthermore, its threshold-based classification may not fully capture regional variations or the interconnected nature of the goals.

Table 2

Sustainable Development Goals (SDGs) and their Descriptions.

SDG Number	Goal Name
SDG 1	No Poverty
SDG 2	Zero Hunger
SDG 3	Good Health and Well-being
SDG 4	Quality Education
SDG 5	Gender Equality
SDG 6	Clean Water and Sanitation
SDG 7	Affordable and Clean Energy
SDG 8	Decent Work and Economic Growth
SDG 9	Industry, Innovation, and Infrastructure
SDG 10	Reduced Inequalities
SDG 11	Sustainable Cities and Communities
SDG 12	Responsible Consumption and Production
SDG 13	Climate Action
SDG 14	Life Below Water
SDG 15	Life on Land
SDG 16	Peace, Justice, and Strong Institutions
SDG 17	Partnerships for the Goals

3.3.3 Analytical Techniques

This study employed a combination of descriptive and inferential statistical techniques to analyse the data. Descriptive statistics were used to summarize and visualize the key variable, which is the SDGs Dashboard. Cross-tabulations were conducted to explore the distribution of SDGs Dashboard categories within each region. This allowed for a comparative analysis of how regions differ in terms of SDG Achievement levels. Before conducting inferential analysis, the normality assumption was tested using the Shapiro-Wilk test. The results revealed that most variables deviated significantly from normality, with W values ranging between 0.712 and 0.893 ($p < 0.05$), indicating that the assumption of normality was violated, and the nature of the variable being ordinal, justifying the use of a non-parametric test.

Consequently, the Kruskal-Wallis test was applied to examine whether there were statistically significant differences in SDGs Achievement across regions. The test evaluates differences in median ranks across regions rather than mean differences, making its interpretation more appropriate for categorical data structured on hierarchical scales. Following the Kruskal-Wallis test, Dunn's pairwise comparison test with Bonferroni correction was conducted to identify the specific regional differences by adjusting the p-values to control Type 1 error for multiple comparisons. The test is suitable due to the ordinal and non-normal nature of the data.

IV. FINDINGS & DISCUSSION

4.1 Descriptive Results

This section presents the summary statistics of the study, focusing on the SDGs Dashboard as the key variable that captures the level of achievement for each SDG across the five African regions, categorized into four levels: Major Challenges, Significant Challenges, Challenges Remain, and Goal Achievement. Using cross-tabulation, the analysis explores the regional distribution of SDG performance and achievement, highlighting disparities and patterns in progress toward the global goals. The detailed results of the descriptive analysis, including the regional distribution tables for each SDG, are presented in Appendix A. The findings demonstrate pronounced yet broadly shared developmental disparities across African regions in achieving the SDGs.

Overall, the majority of African countries remain within the "Major Challenges" and "Significant Challenges" categories, particularly concerning SDG 1 and SDG 2 (see Table A1 and A2), underscoring persistent poverty, food insecurity, and economic vulnerability. Similarly, progress toward SDG 3 and SDG 4 (see Table A3 and A4) remains limited due to underdeveloped infrastructure, insufficient human resources, and policy misalignment. Challenges

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relating to SDG 5 and SDG 6 (see Table A5 and A6) further reflect deep-rooted social and infrastructural inequalities that continue to hinder human development outcomes.

Economic transformation and industrialization goals, namely SDG 7, SDG 8, and SDG 9 (see Table A7, A8, and A9), exhibit slow progress, constrained by low technological capacity, limited access to finance, and weak institutional frameworks. Conversely, moderate advancement is observed in SDG 12 and SDG 13 (see Table A12 and A13), largely attributed to emerging policy coherence in environmental governance and growing adaptation initiatives. Nevertheless, SDG 14, SDG 15, and SDG 16 (see Table A14, A15, and A16) remain critically underachieved due to ecological degradation, governance fragility, and recurring conflicts.

While SDG 17 (see Table A17) reveals relative improvement in intergovernmental collaboration and policy coordination, progress remains uneven, hindered by limited financial mobilization and weak institutional partnerships. Collectively, these findings suggest that Africa's progress toward the 2030 Agenda is constrained by systemic socio-economic and governance challenges, requiring integrated, regionally tailored strategies to accelerate SDG attainment across the continent.

4.2 Hypothesis Testing of Regional Differences in SDG Achievements

Following the descriptive analysis, this section presents the inferential analysis that tests the study's main hypothesis regarding differences in the level of SDGs achievements across African regions. The results of the Kruskal–Walli's test as presented in Table 3 reveal that out of the 17 SDGs examined, 12, including SDG 1, SDG 2, SDG 5, SDG 6, SDG 9, SDG 10, SDG 11, SDG 12, SDG 13, SDG 14, SDG 15, and SDG 17, showed statistically significant regional differences in achievements ($p < 0.05$). This implies that the achievement levels of these goals vary considerably across the five African regions. Although the Kruskal–Wallis test revealed statistically significant variations in performance among regions, a Post-hoc test (Table 4) was employed, which enabled a more detailed understanding of the variations between the region pairs across Africa for each SDG.

Table 3

Regional Differences in SDG Achievement Levels

SDG Dashboard	Mean	Kruskal-Wallis H	Std. Dev.	Min	Max	Asymp. Sig. (p-value)
SDG1	1.52	10.231	0.926	1	4	0.037
SDG2	1.04	16.308	0.191	1	2	0.003
SDG3	1.09	5.706	0.293	1	2	0.222
SDG4	1.35	5.774	0.677	1	4	0.217
SDG5	1.54	21.610	0.794	1	4	0.000
SDG6	1.22	11.738	0.502	1	3	0.019
SDG7	1.13	2.980	0.339	1	2	0.561
SDG8	1.37	4.543	0.525	1	3	0.337
SDG9	1.26	16.629	0.442	1	2	0.002
SDG10	1.59	20.333	0.687	1	4	0.000
SDG11	1.31	11.988	0.639	1	4	0.017
SDG12	3.43	15.417	0.633	2	4	0.004
SDG13	3.56	9.940	0.718	1	4	0.041
SDG14	1.28	12.261	0.564	1	3	0.016
SDG15	1.50	11.832	0.746	1	4	0.019
SDG16	1.09	1.796	0.293	1	2	0.773
SDG17	1.74	17.437	0.678	1	3	0.002

Table 4

Post-hoc Pairwise Comparisons of SDG Achievement across African Regions

SDGs	Region Pair	Test Statistics	Std. Error	z-value	p-value	Adj. Sig. (p-value)
SDG 2	Eastern Africa-Northern Africa	-9.000	2.426	-3.709	0.000	0.002
	Western Africa – Northern Africa	-9.000	2.464	-3.653	0.000	0.003
	Central Africa – Northern Africa	-9.000	2.713	-3.318	0.001	0.009
	Southern Africa – Northern Africa	9.000	3.117	2.888	0.004	0.039
SDG 5	Western Africa – Eastern Africa	13.628	4.682	2.911	0.004	0.036
	Western Africa – Southern Africa	-28.806	6.981	-4.126	0.000	0.000
	Northern Africa – Southern Africa	-26.900	8.251	-3.260	0.001	0.011
SDG 6	Western Africa – Northern Africa	-15.708	5.085	-3.089	0.002	0.020
SDG 9	Eastern Africa – Northern Africa	-19.500	5.630	-3.464	0.001	0.005
	Western Africa – Northern Africa	-19.125	5.717	-3.345	0.001	0.008
SDG 10	Southern Africa – Western Africa	23.500	7.200	3.624	0.001	0.011

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	Central Africa – Western Africa	17.944	5.855	3.065	0.002	0.022
	Eastern Africa – Western Africa	-14.444	4.828	-2.992	0.003	0.028
SDG 11	Western Africa – Northern Africa	-16.406	5.616	-2.921	0.003	0.035
SDG 12	Northern Africa – Western Africa	19.438	6.726	2.890	0.004	0.039
SDG 14	Eastern Africa – Central Africa	-15.917	4.653	-3.421	0.001	0.006
SDG 17	Central Africa – Southern Africa	-28.867	7.983	-3.616	0.000	0.003
	Eastern Africa – Southern Africa	-24.950	7.235	-3.448	0.001	0.006

4.3 Discussion of the Findings

The results of the Kruskal–Wallis analysis reveal statistically significant regional disparities in the attainment of several SDGs across Africa, reflecting persistent development imbalances on the continent. Although collective differences were significant for most indicators, post-hoc comparisons indicate that few regions exhibit exceptionally strong or weak performance relative to others (Table 4). This pattern underscores a shared structural development challenge among African regions, shaped by historical, institutional, and socio-economic constraints.

The results for SDG 1 show significant differences across regions ($H = 10.23$, $p < 0.05$), yet the absence of pairwise significance indicates that poverty remains a continental challenge rather than a region-specific issue. The African Sustainable Development Report of 2024 highlights that over half of the world's poor reside in Africa, emphasizing the magnitude of the problem. Adeyeye et al. (2023) similarly noted that pervasive poverty may be driven by rapid population growth, weak governance, conflicts, and disease burdens such as HIV/AIDS and malaria. The consistency between these findings suggests that structural poverty in Africa transcends regional boundaries, requiring coordinated policy interventions rather than isolated national efforts.

Significant variation is also observed in SDG 2 ($H = 16.31$, $p < 0.05$), where Northern Africa outperforms other regions. This aligns with Otekunrin (2025), who reported that Northern Africa has achieved relative food security through investments in irrigation, agricultural innovation, and policy coordination. In contrast, the sub-Saharan regions lag, reflecting low agricultural productivity, limited mechanization, and climate-related shocks (Food and Agriculture Organization of the United Nations, 2023). These disparities may underscore the role of institutional effectiveness and technological capacity in determining food security outcomes across Africa.

Regarding SDG 5 ($H = 21.61$, $p < 0.05$), the superior performance of Southern Africa compared to other regions might be attributed to its comprehensive legal and policy frameworks promoting women's empowerment. As Vyas-Doorgapersad (2023) notes, instruments such as the Employment Equity Act and the Labour Relations Act have been instrumental in promoting inclusive governance in the Southern Africa region, such as South Africa. Conversely, persistent gender inequalities in Eastern Africa mirror the findings of the United Nations Women (2023), which attributes these gaps to entrenched cultural norms and weak institutional enforcement. This reinforces the argument that gender parity is closely linked to governance quality and policy enforcement.

The pattern observed in SDG 6 ($H = 11.74$, $p < 0.05$) also reflects structural disparities. Northern Africa again leads, reflecting superior infrastructure, stronger institutional frameworks, and higher public-sector investment (African Union Commission et al., 2023). Western Africa's lagging performance may be associated with inadequate sanitation infrastructure, rapid urbanization, and limited financial capacity for water management. This aligns with the work of Amankwah-Amoah et al. (2022), who argued that infrastructural deficits and weak regulatory capacity remain major barriers to environmental sustainability in sub-Saharan Africa.

The regional disparities in SDG 9 ($H = 16.63$, $p < 0.05$) and SDG 10 ($H = 20.33$, $p < 0.05$) further emphasize the importance of economic diversification and technological advancement. Northern Africa's advantage in SDG 9 might be driven by its consistent performance with its relatively developed industrial base and investment in research and development (United Nations Economic Commission for Africa, 2021). In contrast, the sub-Saharan regions face challenges related to inadequate infrastructure, unreliable energy supply, and limited access to finance (World Bank, 2025). For SDG 10, Southern Africa's stronger performance aligns with Hallum and Obeng (2019), who found that redistributive fiscal policies and social-protection mechanisms contribute to more equitable income distribution. However, persistent inequality in Eastern Africa, despite economic growth, reflects the findings of Kamande and Martin (2022), who highlight widening digital and educational divides.

The analysis of SDG 11 ($H = 11.99$, $p < 0.05$) and SDG 12 ($H = 15.42$, $p < 0.05$) underscores the influence of urban management and policy coherence. Western Africa's weaker performance on SDG 11 mirrors the United Nations Development Programme report (2023), which found that nearly half of its urban population lives in informal settlements, compared to less than 10% in Northern Africa. Similarly, Northern Africa's superior performance in SDG 12 may correspond with proactive policies promoting energy efficiency and circular economy initiatives (UNECA, 2022). These results suggest that policy integration and governance coherence are crucial for advancing sustainable urbanization and responsible consumption.

Although SDG 13 ($H = 9.94$, $p < 0.05$) and SDG 15 ($H = 11.83$, $p < 0.05$) show significant omnibus differences, post-hoc tests reveal no distinct regional outliers, suggesting that environmental vulnerability is a shared challenge. The

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African Sustainable Development Report of 2024 underscores that nearly all African regions face recurrent climate shocks and land degradation, affecting agricultural productivity and biodiversity conservation. Similarly, SDG 14 ($H = 12.26$, $p < 0.05$) highlights significant differences between Central and Eastern Africa, consistent with Doumenge et al. (2021), who attribute Central Africa's progress to increased marine protection efforts.

Lastly, SDG 17 ($H = 17.44$, $p < 0.05$) demonstrates that Southern Africa performs significantly better than Central and Eastern Africa, consistent with AU (2024) findings that the region maintains stronger fiscal capacity, trade integration, and digital infrastructure. The results highlight that sustainable development partnerships are not only financial but also institutional, requiring coherent governance frameworks that enhance cooperation among states and development partners.

Overall, the results reveal that Africa's SDG performance might be strongly influenced by structural inequalities, governance quality, and policy implementation capacity rather than geographical endowments. The observed disparities reaffirm the need for regionally customized, yet continent-wide, strategies that strengthen institutional resilience, promote inclusive growth, and enhance inter-regional cooperation. Addressing governance deficits, investing in infrastructure, and building human capital remain central to accelerating Africa's progress toward the 2030 Agenda.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study investigated regional disparities in achieving the SDGs across Africa, using the SDG Dashboard classification and nonparametric statistical techniques. Providing a systematic diagnostic map of the disparities, establishing an empirical baseline that can guide future causal investigations and political-economy analyses of sustainable development in Africa. The empirical results reveal statistically significant variations among African regions, confirming that progress toward the 2030 Agenda remains uneven, fragmented, and constrained by deep-seated structural asymmetries. A substantial proportion of African countries remain in the "Major Challenges" tier for key SDGs, including SDG 1, SDG 2, SDG 3, SDG 6, SDG 7, SDG 9, SDG 11, SDG 14, and SDG 16. Only SDG 12 and SDG 13 indicate measurable progress, suggesting that Africa's trajectory toward sustainable development remains modest but promising in selected thematic areas.

The observed disparities are not stochastic but structurally determined, emanating from variations in economic capacity, governance quality, institutional maturity, and infrastructural development. Northern Africa demonstrates relatively stronger performance, which might be largely driven by its diversified industrial base, robust public investment, advanced digital and transport infrastructure, and integration into global value chains. Conversely, Southern and Central Africa exhibit weaker performance, which may be constrained by governance deficits, fragile infrastructure, recurrent political instability, dependence on primary commodities, and limited technological innovation. Eastern and Western Africa occupy an intermediate position, showing partial progress on selected goals but struggling to maintain consistency across the SDG framework. These findings reinforce the argument that regional disparities in SDG performance are fundamentally systemic, reflecting historical, structural, and institutional asymmetries that impede the realization of inclusive and balanced sustainable development across the continent.

5.2 Recommendations

Regions exhibiting lower SDG performance should systematically adopt and adapt successful policy models from better-performing counterparts. Establishing structured regional learning mechanisms such as African Regional SDG Learning Hubs or inter-country technical working groups under the African Union would facilitate peer learning, the exchange of best practices, and coordinated policy reforms. Such collaborative platforms can help reduce achievement gaps and foster regional policy convergence.

Governments, regional blocs, and development partners should prioritize investments in underperforming SDGs and lagging regions. Targeted resource allocation should focus on strengthening digital data systems for SDG monitoring, improving agricultural productivity, expanding water and sanitation infrastructure, and promoting community-driven development initiatives. Prioritizing resources where structural challenges are most acute will accelerate overall progress and narrow regional disparities.

Reinforcing institutional capacity and policy coherence remains essential for sustainable SDG implementation. Aligning national development strategies with continental frameworks such as Agenda 2063, the Comprehensive Africa Agriculture Development Programme (CAADP), and the African Continental Free Trade Area (AfCFTA) can enhance policy alignment and stimulate inclusive growth. Empowering Regional Economic Communities (RECs) and national SDG coordination units will further ensure governance accountability, facilitate inter-regional coordination, and accelerate progress in regions facing major developmental challenges.

Despite offering critical insights, this study acknowledges certain limitations. The reliance on the SDG Dashboard constrained the analysis to available composite indicators, which may have obscured within-country

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variations and recent policy changes. Moreover, inconsistencies in regional data quality and reporting standards could have influenced comparative accuracy. Future research should therefore employ micro-level and longitudinal approaches to explore intra-regional variations and investigate the causal linkages between institutional quality, policy effectiveness, and SDG outcomes. Such analyses will deepen understanding of the mechanisms driving sustainable development disparities across Africa and inform more precise, evidence-based interventions.

REFERENCES

Adeyeye, S. A. O., Ashaolu, T. J., Bolaji, O. T., Abegunde, T. A., & Omoyajowo, A. O. (2023). Africa and the Nexus of poverty, malnutrition and diseases. *Critical Reviews in Food Science and Nutrition*, *63*(5), 641-656.https://doi.org/10.1080/10408398.2021.1952160

African Union Commission (AUC), United Nations Economic Commission for Africa (ECA), African Development Bank (AfDB), & United Nations Development Programme (UNDP). (2023). *2023 Africa sustainable development report: Accelerating recovery from the coronavirus disease (COVID-19) and the full implementation of the 2030 Agenda for Sustainable Development and African Union Agenda 2063 at all levels*. UnitedNations. https://www.undp.org/sites/g/files/zskgke326/files/202310/undp_africa_2023_africa_sustainable_development_report.pdf

African Union Commission, African Development Bank, United Nations Development Programme, and United Nations Economic Commission for Africa. (2024). *2024 Africa sustainable development report: Reinforcing the 2030 Agenda and Agenda 2063 and eradicating poverty in times of multiple crises: The effective delivery of sustainable, resilient and innovative solutions*.https://www.undp.org/sites/g/files/zskgke326/files/2024-07/asdr_2024_-_en_0.pdf

African Union [AU]. (2024). *Africa Sustainable Development Report 2024: Progress and prospects on the implementation of Agenda 2063 and Agenda 2030*. https://www.uneca.org/africa-sustainable-development-report-2024

Amankwah-Amoah, J., Boso, N., & Kutsoati, J. K. (2022). Institutionalization of protection for intangible assets: Insights from the counterfeit and pirated goods trade in sub-Saharan Africa. *Journal of World Business*, *57*(2), 101307.https://doi.org/10.1016/j.jwb.2021.101307

Ammari, M., Chentouf, M., Ammari, M., & Ben Allal, L. (2022). Assessing national progress in achieving the Sustainable Development Goals: A case study of Morocco. *Sustainability*, *14*(23), 15582.https://doi.org/10.3390/su142315582

Bain, P. G., Kroonenberg, P. M., Johansson, L. O., Milfont, T. L., Crimston, C. R., Kurz, T., ... & Park, J. (2019). Public views of the Sustainable Development Goals across countries. *Nature sustainability*, *2*(9), 819-825.https://doi.org/10.1038/s41893-019-0365-4

Bie, Q., Wang, S., Qiang, W., Ma, X., Gu, Z., & Tian, N. (2023). Progress toward Sustainable Development Goals and interlinkages between them in Arctic countries. *Heliyon*, *9*(2). https://doi.org/10.1016/j.heliyon.2023.e13306

Bolaji J., Oluwaseun S.S. (2022), Why the Sustainable Development Goals Matter in Africa? *African Journal of Economics and Sustainable Development 5*(3), 73-82. https://doi.org/10.52589/ajesd-ur23qjun

Chapman, G. R., Cully, A., Kosiol, J., Macht, S. A., Chapman, R. L., Fitzgerald, J. A., & Gertsen, F. (2020). The wicked problem of measuring real-world research impact: Using sustainable development goals (SDGs) and targets in academia. *Journal of Management & Organization*, *26*(6), 1030-1047.https://doi.org/10.1017/jmo.2020.16

Confraria, H., Ciarli, T., & Noyons, E. (2024). Countries' research priorities in relation to the sustainable development goals. *Research policy*, *53*(3), 104950.https://doi.org/10.1016/j.respol.2023.104950

De Francesco, F., Pattyn, V., & Salamon, H. (2024). The monitoring and evaluation challenges of the sustainable development goals: An assessment in three European countries. *Sustainable Development*, *32*(3), 1913-1924.https://doi.org/10.1002/sd.2759

Doumenge, C., Palla, F., & Madzous, G. L. I. (2021). *State of protected areas in Central Africa 2020* (pp. 404-p). OFAC; COMIFAC. https://doi.org/10.1017/s0030605322001090

Estoque, R. C. (2020). A review of the sustainability concept and the state of SDG monitoring using remote sensing. *Remote Sensing*, *12*(11), 1770.https://doi.org/10.3390/rs12111770

Food and Agriculture Organization of the United Nations. (2023). *The state of food and agriculture 2023: Revealing the true cost of food to transform agrifood systems*. FAO. https://doi.org/10.4060/cc7724en

Ghosh, P., & Chakravarty, T. (2024). Sustainable development goals: Challenges, opportunities, and the way forward. In V. Dutta & P. Ghosh (Eds.), *Sustainability: Science, policy, and practice in India: Challenges and opportunities* (pp. 235–241). Springer, Cham. https://doi.org/10.1007/978-3-031-50132-6_17

Hallum, C., & Obeng, K. W. (2019). *The West Africa inequality crisis: How West African governments are failing to reduce inequality, and what should be done about it*.Oxfam.http://policy-

Licensed Under Creative Commons Attribution (CC BY-NC)

practice.oxfam.org.uk/publications/the-west-africa-inequality-crisis-how-west-african-governments-are-failing-to-r-620837

Kamande, A., & Martin, M. (2022). *The inequality crisis in East Africa: Fighting austerity and the pandemic*. Oxfam.

Kasirye, I., Ntale, A., & Venugopal, G. (2020). Implementation progress of the SDGs: Sub-Saharan Africa regional survey. *Occasional Paper Series*, (66).

Lafortune, G., Fuller, G., Moreno, J., Schmidt-Traub, G., & Kroll, C. (2018). SDG index and dashboards detailed methodological paper. *Sustainable Development Solutions Network*, *9*, 1-56.

Lorren K, H., Nikki F, Michelle, A., Constansia M., & Anton Nahman (2019). The Sustainable Development Goals in South Africa: Investigating the need for multi-stakeholder partnerships, *Development Southern Africa, 36*:5, 555-569. https://doi.org/10.1080/0376835x.2018.1461611

Lucks, D. (2021). *CEPA strategy guidance note on monitoring and evaluation systems.* United Nations Department of Social and Economic Affairs. https://publicadministration.un.org/Portals/1/Strategy%20note%20monitoring%20and%20evaluation%20Mar%202021_1.pdf

Lucks, D., & D'Errico, S. (2016). *Evaluation: A crucial ingredient for SDG success.* Briefing paper International Institute for Environment and Development (IIED). https://pubs.iied.org/sites/default/files/pdfs/migrate/17357IIED.pdf

Mlambo, V.H. & Niyitunga, E.B. (2024), "Assessing SDG achievement in Africa: Case studies on poverty, hunger, and gender equality", *International Journal of Development and Sustainability,* Vol. 13 No. 7, pp. 546-564.

Osman, A., Mensah, E. A., Mensah, C. A., Asamoah, Y., Dauda, S., Adu-Boahen, K., & Adongo, C. A. (2022). Spatial analysis of synergies and trade-offs between the Sustainable Development Goals (SDGs) in Africa. *Geography and Sustainability*, *3*(3), 220-231.https://doi.org/10.1016/j.geosus.2022.07.003

Otekunrin, O. A. (2025). A Critical Assessment of the Interplay of Conflict, Hunger, Poverty, and Food Insecurity in Africa. *Food and Humanity*, 100544.https://doi.org/10.1016/j.foohum.2025.100544

Sachs, J., Lafortune, G., Kroll, C., Fuller, G., Woelm, F. (2022). *From Crisis to Sustainable Development: the SDGs as Roadmap to 2030 and Beyond. Sustainable Development Report 2022.* Cambridge: Cambridge University Press.https://s3.amazonaws.com/sustainabledevelopment.report/2022/2022-sustainable-development-report.pdf

Sachs, J.D., Lafortune, G., Fuller, G. (2024). *The SDGs and the UN Summit of the Future. Sustainable Development Report 2024.* Paris: SDSN, Dublin: Dublin University Press. https://doi:10.25546/108572

Sachs, J.D., Lafortune, G., Fuller, G., Iablonovski, G. (2025). *Financing Sustainable Development to 2030 and Mid-Century. Sustainable Development Report 2025.* Paris: SDSN, Dublin: Dublin University Press. DOI: https://doi.org/10.25546/111909

Schmidt-Traub, G., Kroll, C., Teksoz, K., Durand-Delacre, D., & Sachs, J. D. (2017). National baselines for the Sustainable Development Goals assessed in the SDG Index and Dashboards. *Nature geoscience*, *10*(8), 547-555.https://doi.org/10.1038/ngeo2985

Shi, L., Han, L., Yang, F., & Gao, L. (2019). The evolution of sustainable development theory: Types, goals, and research prospects. *Sustainability*, *11*(24), 7158. https://doi.org/10.3390/su11247158

Sorooshian, S. (2024). The sustainable development goals of the United Nations: A comparative midterm research review. *Journal of Cleaner Production, 142272*.https://doi.org/10.1016/j.jclepro.2024.142272

UN Women. (2023). *Progress on the Sustainable Development Goals: The gender snapshot 2023*. New York: United Nations Entity for Gender Equality and the Empowerment of Women (UN Women).https://www.unwomen.org/en/digital-library/publications/2023/09/progress-on-the-sustainable-development-goals-the-gender-snapshot-2023

United Nations (UN). (2023). *Sustainable Development: The 17 goals.* Department of Economic and Social Affairs (2023). https://sdgs.un.org/goals.

United Nations Development Program (UNDP). (2023). *Africa Sustainable Development Report 2023*. United Nations Development Programme. https://www.africa.undp.org

United Nations Economic Commission for Africa (UNECA). (2021). *North African countries and SDG 9 of the United Nations 2030 Agenda: The way forward* (ECA/SRO-NA/ICSOE/36/3). United Nations Economic Commission for Africa.https://knowledgehub-sro-na.uneca.org/wp-content/uploads/2023/04/North-African-Countries-and-SDG-9-of-the-United-Nations-2030-Agenda-ENG-2021.pdf

United Nations Economic Commission for Africa [UNECA]. (2022). *African gender equality index 2022: Promoting gender equality for an inclusive Africa*. Addis Ababa, Ethiopia: United Nations Economic Commission for Africa.

Van de Ven, D. J., Sampedro, J., Johnson, F. X., Bailis, R., Forouli, A., Nikas, A., & Doukas, H. (2019). Integrated policy assessment and optimization over multiple sustainable development goals in Eastern Africa. *Environmental Research Letters, 14*(9), 094001.https://doi.org/10.1088/1748-9326/ab375d

Licensed Under Creative Commons Attribution (CC BY-NC)

Vyas-Doorgapersad, S. (2023). Challenges to achieve the goal 5 of the Sustainable Development Goals (SDG) in South Africa. *International Journal of Research in Business and Social Science (2147-4478), 12*(6), 257-266. https://doi.org/10.20525/ijrbs.v12i6.2687

Wernecke, B., Mathee, A., Kunene, Z., Balakrishna, Y., Kapwata, T., Mogotsi, M., ... & Wright, C. Y. (2021). Tracking progress towards the Sustainable Development Goals in four rural villages in Limpopo, South Africa. *Annals of Global Health*, *87*(1), 16.https://doi.org/10.5334/aogh.3139

World Bank. (2025). *South Africa overview: Development news, research, and data.* World Bank. Retrieved September 4, 2025, from https://www.worldbank.org/en/country/southafrica/overview

World Commission on Environment and Development (WCED). (1987). *Our Common Future.* Oxford University Press. https://doi.org/10.1002/jid.3380010208

Zahedi, S. (2019). Sustainable development theory: A critical perspective and an integrative model. *Journal of Economics and Sustainable Development, 10*(21), 43–52. https://doi.org/10.7176/jesd/10-21-05

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APPENDIX
Appendix A: Descriptive Results

Table A1

Regional distribution of SDG 1 achievements

Region	Major Challenges (%)	Significant Challenges (%)	Challenges Remain (%)	Goal Achievement (%)	Total (%)
Central Africa	8(88.9)	0(0.0)	1(11.1)	0(0.0)	9(100)
Eastern Africa	14(77.8)	2(11.1)	0(0.0)	2(11.1)	18(100)
Northern Africa	2(33.3)	0(0.0)	2(33.3)	2(33.3)	6)100)
Southern Africa	5(100)	0(0.0)	0(0.0)	0(0.0)	5(100)
Western Africa	9(56.3)	6(37.5)	1(6.3)	0(0.0)	16(100)
Total	38(70.4)	8(14.8)	4(7.4)	4(7.4)	54(100)

Table A2

Regional distribution of SDG 2 Achievements

Regions	Major Challenges (%)	Significant Challenges (%)	Total (%)
Central Africa	9(100)	0(0.0)	9(100)
Eastern Africa	18(100)	0(0.0)	18(100)
Northern Africa	4(66.7)	2(33.3)	6(100)
Southern Africa	5(100)	0(0.0)	5(100)
Western Africa	16(100)	0(0.00)	16(100)
Total	52(96.3)	2(3.7)	54(100)

Table A3

Regional Distribution of SDG 3 Achievements

Regions	Major Challenges (%)	Significant Challenges (%)	Total (%)
Central Africa	9(100)	0(0.0)	9(100)
Eastern Africa	16(88.9)	2(11.1)	18(100)
Northern Africa	4(66.7)	2(33.3)	6(100)
Southern Africa	5(100)	0(0.0)	5(100)
Western Africa	15(93.8)	1(6.3)	16(100)
Total	49(90.7)	5(9.3)	54(100)

Table A4

Regional Distribution of SDG 4 Achievements

Region	Major Challenges (%)	Significant Challenges (%)	Challenges Remain (%)	Goal Achievement (%)	Total (%)
Central Africa	8(88.9)	1(11.1)	0(0.0)	0(0.0)	9(100)
Eastern Africa	14(77.8)	2(11.1)	1(5.6)	1(5.6)	18(100)
Northern Africa	3(50.0)	3(50.0)	0(0.0)	0(0.0)	6(100)
Southern Africa	2(40.0)	2(40.0)	1(20.0)	0(0.0)	5(100)
Western Africa	13(81.3)	2(12.5)	1(6.3)	0(0.0)	16(100)
Total	40(74.1)	10(18.5)	3(5.6)	1(1.9)	54(100)

Table A5

Regional Distribution of SDG 5 Achievements

Region	Major Challenges (%)	Significant Challenges (%)	Challenges Remain (%)	Goal Achieved (%)	Total (%)
Central Africa	6 (66.7)	3 (33.3)	0 (0.0)	0 (0.0)	9(100)
Eastern Africa	7 (38.9)	9 (50.0)	2 (11.1)	0 (0.0)	18(100)
Northern Africa	5 (83.3)	1 (16.7)	0 (0.0)	0 (0.0)	6(100)
Southern Africa	0 (0.0)	2 (40.0)	1 (20.0)	2 (40.0)	5(100)
Western Africa	15 (93.8)	0(0.0)	1 (6.3)	0 (0.0)	16(100)
Total	33 (61.1)	15 (27.8)	4 (7.4)	2 (3.7)	54(100)

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Table A6

Regional Distribution of SDG 6 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Total** (%)
Central Africa	8 (88.9)	1 (11.1)	0 (0.0)	9(100)
Eastern Africa	16 (88.9)	0 (0.0)	2 (11.1)	18(100)
Northern Africa	2 (33.3)	4 (66.7)	0 (0.0)	6(100)
Southern Africa	3 (60.0)	2 (40.0)	0 (0.0)	5(100)
Western Africa	15 (93.8)	1 (6.3)	0 (0.0)	16(100)
Total	44 (81.5)	8 (14.8)	2 (3.7)	54(100)

Table A7

Regional Distribution of SDG 7 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Total** (%)
Central Africa	8(88.9)	1(11.1)	9(100)
Eastern Africa	16(88.9)	2(11.1)	18(100)
Northern Africa	4(66.7)	2(33.3)	6(100)
Southern Africa	5(100)	0(0.0)	5(100)
Western Africa	14(87.5)	2(12.5)	16(100)
Total	47(87.0)	7(13.0)	54(100)

Table A8

Regional Distribution of SDG 8 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Total** (%)
Central Africa	6 (66.7)	3 (33.3)	0 (0.0)	9 (100)
Eastern Africa	12 (66.7)	5 (27.8)	1 (5.6)	18 (100)
Northern Africa	6 (100.0)	0 (0.0)	0 (0.0)	6 (100)
Southern Africa	3 (60.0)	2 (40.0)	0 (0.0)	5 (100)
Western Africa	8 (50.0)	8 (50.0)	0 (0.0)	16 (100)
Total	35 (64.8)	18 (33.3)	1 (1.9)	54 (100)

Table A9

Regional Distribution of SDG 9 Achievements

Region	**Major Challenges (%)**	**Significant Challenges (%)**	**Total (%)**
Central Africa	7 (77.8)	2 (22.2)	9(100)
Eastern Africa	16 (88.9)	2 (11.1)	18(100)
Northern Africa	1 (16.7)	5 (83.3)	6(1000
Southern Africa	2 (40.0)	3 (60.0)	5(100)
Western Africa	14 (87.5)	2 (12.5)	16(100)
Total	40 (74.1)	14 (25.9)	54(100)

Table A10

Regional Distribution of SDG 10 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Goal Achievement** (%)	**Total** (%)
Central Africa	7 (77.8)	2 (22.2)	0 (0.0)	0 (0.0)	9(100)
Eastern Africa	12 (66.7)	5 (27.8)	1 (5.6)	0 (0.0)	18(100)
Northern Africa	1 (16.7)	4 (66.7)	0 (0.0)	1 (16.7)	6(100)
Southern Africa	5 (100)	0 (0.0)	0 (0.0)	0 (0.0)	5(100)
Western Africa	2 (12.5)	12 (75.0)	2 (12.)	0 (0.0)	16(100)
Total	27 (50.0)	23(42.6)	3(5.6)	1(1.9)	54(100)

Table A11

Regional Distribution of SDG 11 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Goal Achievement** (%)	**Total** (%)
Central Africa	8 (88.9)	0 (0.0)	1 (11.1)	0 (0.0)	9(100)
Eastern Africa	14 (77.8)	3 (16.7)	0 (0.0)	1 (5.6)	18(100)
Northern Africa	2 (33.3)	3 (50.0)	1 (16.7)	0 (0.0)	6(100)
Southern Africa	2 (40.0)	3 (60.0)	0 (0.0)	0 (0.0)	5(100)
Western Africa	15 (93.8)	1 (6.3)	0 (0.0)	0 (0.0)	16(100)
Total	41 (75.9)	10 (18.5)	2 (3.7)	1 (1.9)	54(100)

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Table A12

Regional Distribution of SDG 12 Achievements

Region	**Significant Challenges** (%)	**Challenges Remain** (%)	**Goal Achievement** (%)	**Total** (%)
Central Africa	1 (11.1)	4 (44.4)	4 (44.4)	9(100)
Eastern Africa	1 (5.6)	5 (27.8)	12 (66.7)	18(100)
Northern Africa	1 (16.7)	5 (83.3)	0 (0.0)	6(100)
Southern Africa	1 (20.0)	4 (80.0)	0 (0.0)	5(100)
Western Africa	0 (0.0)	5 (31.3)	11 (68.8)	16(100)
Total	4 (7.4)	23 (42.6)	27 (50.0)	54(100)

Table A13

Regional Distribution of SDG 13 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Goal Achievement** (%)	**Total** (%)
Central Africa	0 (0.0)	1 (11.1)	3 (33.3)	5 (55.6)	9(100)
Eastern Africa	0 (0.0)	0 (0.0)	4 (22.2)	14 (77.8)	18(100)
Northern Africa	1 (16.7)	1 (16.7)	2 (33.3)	2 (33.3)	6(100)
Southern Africa	0 (0.0)	2 (40.0)	1 (20.0)	2 (40.0)	5(100)
Western Africa	0 (0.0)	0 (0.0)	3 (18.8)	13 (81.3)	16(100)
Total	1 (1.9)	4 (7.4)	13 (24.1)	36 (66.7)	54(100)

Table A14

Regional Distribution of SDG 14 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Total** (%)
Central Africa	3 (33.3)	5 (55.6)	1 (11.1)	9(100)
Eastern Africa	17 (94.4)	0 (0.0)	1 (5.6)	18(100)
Northern Africa	5 (83.3)	1 (16.7)	0 (0.0)	6(100)
Southern Africa	4 (80.0)	0 (0.0)	1 (20.0)	5(100)
Western Africa	13 (81.3)	3 (18.8)	0 (0.0)	16(100)
Total	42 (77.8)	9 (16.7)	3 (5.6)	54(100)

Table A15

Regional Distribution of SDG 15 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Goal Achievement** (%)	**Total** (%)
Central Africa	4 (44.4)	2 (22.2)	3 (33.3)	0 (0.0)	9(100)
Eastern Africa	16 (88.9)	2 (11.1)	0 (0.0)	0 (0.0)	18(100)
Northern Africa	5 (83.3)	1 (16.7)	0 (0.0)	0 (0.0)	6(100)
Southern Africa	3 (60.0)	0 (0.0)	1 (20.0)	1 (20.0)	5(100)
Western Africa	6 (37.5)	9 (56.3)	1 (6.3)	0 (0.0)	16(100)
Total	34 (63.0)	14 (25.9)	5 (9.3)	1 (1.9)	54(100)

Table A16

Regional Distribution of SDG 16 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Total** (%)
Central Africa	8 (88.9)	1 (11.1)	9(100)
Eastern Africa	17 (94.4)	1 (5.6)	18(100)
Northern Africa	6 (100.0)	0 (0.0)	6(100)
Southern Africa	4 (80.0)	1 (20.0)	5(100)
Western Africa	14 (87.5)	2 (12.5)	16(100)
Total	49 (90.7)	5 (9.3)	54(100)

Table A17

Regional Distribution of SDG 17 Achievements

Region	**Major Challenges** (%)	**Significant Challenges** (%)	**Challenges Remain** (%)	**Total** (%)
Central Africa	6 (66.7)	3 (33.3)	0 (0.0)	9(100)
Eastern Africa	9 (50.0)	9 (50.0)	0 (0.0)	18(100)
Northern Africa	1 (16.7)	3 (50.0)	2 (33.3)	6(100)
Southern Africa	0 (0.0)	1 (20.0)	4 (80.0)	5(100)
Western Africa	5 (31.3)	10 (62.5)	1 (6.3)	16(100)
Total	21 (38.9)	26 (48.1)	7 (13.0)	54(100)

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Transformational leadership in contemporary projects: A review of its impact on success and team performance (2020-2025)

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ABSTRACT

This review explores the role of transformational leadership in influencing project success and team performance, focusing on literature published between 2020 and 2025. Transformational leadership, characterized by idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, is increasingly recognized as a determinant of project outcomes. The findings indicate that transformational leadership enhances project success by fostering team empowerment and collaborative problem-solving and innovation, while simultaneously strengthening team performance through improved communication, adaptability, and motivation. The review identifies gaps in longitudinal and experimental studies, especially within virtual project environments, and emphasizes the importance of contextual factors such as culture, trust, and team climate. Practical implications for project managers and organizations are also discussed, highlighting the value of adaptive leadership in multicultural and remote project teams. Evidence from 2020 to 2025 highlights its role in enabling project teams to navigate complexity and achieve better outcomes. Contextual factors such as culture, trust, and team climate further shape the effectiveness of transformational leadership. Therefore, it is recommended that future studies adopt longitudinal and experimental designs and explore diverse project settings, including virtual and multicultural teams. Project managers should also apply transformational leadership behaviors that build trust, promote innovation, and strengthen team cohesion, while organizations invest in leadership development programs to ensure adaptive, high-performing, and resilient project teams.

Keywords: Organizational Behavior, Project Management, Project Success, Team Performance, Transformational Leadership

I. INTRODUCTION

Leadership plays a central role in determining project outcomes, with transformational leadership emerging as one of the most influential approaches in project management literature (Zhu et al., 2021). Transformational leadership emphasizes motivating and inspiring followers to transcend their self-interest for the achievement of collective goals (Bass & Riggio, 2021). The increasing complexity of projects, combined with globalization, digital transformation, and multicultural teams, necessitates leadership styles that foster adaptability and team cohesion (Nguyen et al., 2023). Despite the growing body of evidence linking transformational leadership to project success and team performance, scholarly discussions continue to reveal gaps regarding contextual moderators, methodological limitations, and practical applications. This review synthesizes recent studies to critically examine the role of transformational leadership in driving project success and enhancing team performance. Although previous studies have explored various mediators linking transformational leadership to project success at the individual level, scholars increasingly emphasize the need for a more comprehensive exploration of team-level mechanisms (Ahmad et al., 2022, Fareed et al., 2022). Given that teams have become the core operational units in project-based organizations (Liu et al., 2022), research has highlighted constructs such as team-building and teamwork quality as facilitators of leadership effectiveness in projects (Pavez et al., 2021). However, there has been limited research on culture, trust and team climate between transformational leadership and project success.

To address this gap, this study reviews contextual factors of culture, trust and team climate. Unlike team-building and teamwork quality, which primarily enhance intra-team coordination, team culture serves as a proactive adaptation process, enabling teams to engage in collective reflection before challenges arise (Liu et al., 2025). Conversely, trust functions as a reactive adaptation activated when teams face challenges and adversity (Pavez et al., 2021). Where reflexivity may fail to anticipate certain challenges, team climate provides the necessary alternative for teams to respond effectively to unforeseen circumstances. By integrating both proactive and reactive adaptation processes, this review offers a more holistic perspective on how transformational leadership influences project success.

In addition, Transformational leaders foster a culture of continuous learning, encouraging teams to embrace setbacks as opportunities for growth and improvement (Sahin & Bilir, 2024). Through observational learning mechanisms, team members internalize leaders' coping strategies when confronting adversities. Project team culture operates as a behavioral adaptation process that allows teams to recover from operational failures and sustain

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performance efficacy under volatile conditions (Pavez et al., 2021). Moreover, the relationship between team culture and team climate is well established (Pavez et al., 2021). Consequently, this review also seeks to explore the aspect of trust between transformational leadership and project success.

Summarily, this review is on how transformational leadership in contemporary projects impacts project success and team performance. It makes two primary contributions to literature by establishing how culture, trust and team climate function as critical mechanisms linking transformational leadership to project success. It also deepens the understanding of how transformational leadership fosters project success by analyzing the dynamic interplay between leadership behaviors, team reflexivity, and team climate.

1.1 Statement of the Problem

Transformational leadership is acknowledged for its contribution to project performance, its influence on project success remains understood within the contemporary projects. Studies show that transformational leaders build team competence through mentoring, training, and modelling desired behaviors (Liu et al., 2021), while also fostering innovation, risk-taking, and proactive problem-solving among project members (Fareed et al., 2022; Ahmad et al., 2022). These practices strengthen team resilience and adaptability, qualities that are critical for team performance in uncertain project contexts.

Despite these theoretical foundations, significant empirical gaps persist. Much of the research on transformational leadership has been conducted in general organizational settings, leaving limited evidence on how t directly shapes team resilience and project outcomes. Although scholars highlight that transformational leadership enhances trust, collective efficacy, and learning from adversity (Jiang et al., 2024; Han et al., 2024), the pathways through which these psychological and behavioral processes contribute to sustained project success are not clearly established. Contextual factors such as team culture, trust, and team climate may further influence how transformational leadership operates, yet these remain underexplored, even though project environments differ substantially in their cultural and relational dynamics (Sahin et al., 2024).

Inadequacy of clarity limits the practical application of transformational leadership principles in contemporary project. While transformational leadership is assumed to enhance project success by building resilient, cohesive, and adaptive teams, the specific interactions among leadership behaviors, team culture, trust, and team performance are not sufficiently defined. As a result, project managers lack evidence-based guidance on how transformational leadership can be leveraged to consistently drive successful project outcomes. It is on this breathe that a need for empirical review to clarify how contextual factors—such as trust, team climate, and project team culture—shape the relationship between transformational leadership and project success in contemporary projects.

1.2 Research Objective

To examine how transformational leadership practices influence project success and team performance in contemporary project environments between 2020 and 2025.

II. METHODOLOGY

2.1 Desk Review Approach

This review adopts a desk-based integrative approach to evaluate empirical studies on transformational leadership, project success, and team performance. The goal was to synthesize findings across diverse contexts. The approach involves consolidating findings from multiple independent studies to generate a comprehensive understanding of how transformational leadership operates across different project environments. By integrating diverse perspectives, methodologies, and contexts, the review seeks to identify patterns, theoretical consistencies, and unresolved gaps in the literature. This method is particularly suited for synthesizing contemporary research, as it enables the extraction of broader insights without the constraints of primary data collection.

2.2 Data Sources

Databases including Scopus, Web of Science, and Google Scholar were searched for peer-reviewed journal articles published between 2020 and 2025. A structured search strategy was implemented using reputable academic databases to ensure broad and credible coverage of current research. The databases consulted included Scopus, Web of Science, and Google Scholar, all of which provide access to high-impact, peer-reviewed scholarly publications. Searches targeted articles published between 2020 and 2025 to capture the most recent developments in leadership research and contemporary project management practices.

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2.3 Inclusion and Exclusion Criteria

Inclusion criteria consisted of peer-reviewed articles, empirical studies, and meta-analyses within project management settings. Excluded from analysis were non-peer-reviewed materials, opinion pieces, purely theoretical or conceptual papers lacking empirical evidence, and studies focused on unrelated fields where project management was not a central component. This filtering process ensured that the selected literature directly contributed to the research focus.

2.4 Synthesis and Analysis

A thematic synthesis approach was employed, categorizing findings into themes such as direct effects, mediators, moderators, and team processes. Quality assessment was guided by methodological rigor and relevance. A thematic synthesis approach was utilized to analyze the selected studies, allowing the review to group findings into meaningful categories aligned with the research objectives. The themes were organized around the direct effects of transformational leadership on project outcomes, mediating mechanisms such as team trust, motivation and resilience, moderating factors including team climate and organizational culture, and broader team processes that influence performance. Each study was assessed for methodological rigor, sample relevance, analytical robustness, and contextual applicability. The synthesis facilitated the identification of dominant trends, contradictory findings, and research gaps, forming the basis for the study's conclusions and recommendations.

III. FINDINGS & DISCUSSION

3.1 Transformational Leadership and Project Success

Transformational leadership is a leadership style that motivates members to transform their beliefs and values to increase their performance over self-interest and prioritize the organization's needs (Shao et al., 2022). Transformational leadership theory, which Burns proposed in 1978, envisions as the ideal relationship between team members and project Implementers. Bass developed the theory into the research of organizations, stating that transformational leadership could encourage members to sacrifice their personal interests by allowing them to recognize the importance of their task. Based on this research, a lot of effort has been made by numerous scholars to study transformational leaders' characteristics and their positive effects on organizational outcomes. Since then, transformational leadership has acquired wide acceptance in leadership studies and project management (Zimmermann et al., 2020). Transformational leadership positively impacts project team performance by developing team members' skills and acting as performance models. Transformational leaders prioritize the development of team members by providing training, mentoring, and growth opportunities, which equip individuals with the necessary skills to handle adversity (Zhu et al., 2021*)*. This focus on skill-building not only enhances individual competencies but strengthens collective team performance. By empowering team members through skill development, transformational leaders contribute to building a resilient team capable of overcoming uncertainty. Additionally, transformational leaders foster a culture where risk-taking and innovation are seen as positive responses to adversity (Fareed et al., 2022). Team members observe how their leader handle challenges and are encouraged to adopt similar strategies (Ahmad et al., 2022). Leaders model how setbacks can be viewed as learning experiences, thereby promoting a growth mindset within the team. This process of modeling behaviors, reinforced by feedback and social support, encourages team members to approach difficulties proactively rather than defensively. A resilient project team is better equipped to handle the dynamic nature of contemporary projects. Fareed et al. (2022) emphasize, robust project team culture enables teams to effectively adapt to challenges and stay on track toward achieving project goals. Thus, project team culture directly contributes to project success by fostering the capacity to overcome obstacles and sustain performance. In addition, when a project team encounters unexpected challenges, its ability to contain and recover from these difficulties is vital for maintaining project success. Jiang et al. (2024) suggests that overcoming adversity boosts collective efficacy beliefs, which increases team trust in the face of future obstacles. Additionally, successful recovery serves as a learning opportunity, where team members observe and replicate problem-solving behaviors through observational learning. This cyclical process of recovery and learning fosters trust and enhances the team's ability to solve problems effectively.

Transformational leaders act as models, exhibiting culture behaviors and trust that team members can observe and emulate (Han et al., 2024*)*. This observational learning process is particularly efficacious due to the reverence and esteem typically accorded to transformational leaders Jiang et al. (2024). Further assertion is made by Sahin and Bilir (2024) who observes that by fostering innovative thinking and encouraging cognitive diversity transformational leaders strengthen the team's ability to anticipate and adapt to challenges. Furthermore, by enhancing team members' trust and confidence, transformational leaders reinforce the collective belief in the team's capability to overcome adversity. As a result, the team develops greater resilience, enabling it to effectively manage stressors and maintain stability in contemporary project (Jiang et al., 2024). Trusted teams demonstrate the ability to contain and recover from setbacks, maintaining performance stability in dynamic project environments (Han et al., 2024*)*. Their capacity to withstand and

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overcome stressors enables the sustainment of long-term project success (Sahin & Bilir, 2024). By fostering resilience through their leadership behaviors, transformational leaders create an adaptive team culture, equipping members to better manage the complexities inherent in project environments. Ultimately, this cultivated culture serves as a crucial driver of project success to contextual factors such as culture, trust and team climate and project team performance between transformational leadership and project success.

3.1.1 Direct Effects

Evidence from Recent Empirical and Meta-Analytical Studies

Recent empirical and meta-analytical studies consistently demonstrate that transformational leadership exerts significant direct effects on project outcomes in contemporary project settings. Evidence from research conducted between 2020 and 2025 shows that transformational leaders positively influence key project success indicators such as timely delivery, quality performance, stakeholder satisfaction, and overall project efficiency. These leaders provide clear vision, articulate high expectations, and inspire commitment, which directly enhance team focus and alignment with project goals. Meta-analytical findings further confirm that transformational leadership is strongly associated with improved team performance, heightened motivation, and greater adaptability, particularly in dynamic and technology-driven project environments. Overall, the direct effects highlight that transformational leadership remains a powerful predictor of project success independent of mediating or contextual factors, reinforcing its relevance in modern project management practice.

3.1.2 Mediators and Team Level Mechanisms

Empowerment, Self-leadership, Team-building and Team Quality

Empowerment, trust, and collaboration mediate the relationship between transformational leadership and project success (Liu et al., 2022). Leaders who foster autonomy encourage self-leadership and proactive problem-solving (Nguyen et al., 2023). Mediators and team level mechanisms play a central role in explaining how transformational leadership translates into project success. Recent studies show that empowerment, trust, and collaboration function as critical mediators that strengthen the influence of transformational leader on project outcomes (Liu et al., 2022). By cultivating a climate of psychological empowerment, transformational leaders enable team members to exercise autonomy, take initiative, and engage in self-leadership, which enhances their capacity for proactive problem-solving in complex project environments (Nguyen et al., 2023).

Trust further reinforces these behaviors by creating a secure relational climate where individuals feel valued and confident in sharing ideas, while collaboration supports knowledge exchange and coordinated action. Together, these mediating mechanisms reveal that the effectiveness of transformational leadership is not solely derived from leader behaviors but also from the dynamic interpersonal processes they activate within teams.

3.1.3 Contextual Moderators

Culture, Team Climate, Trust and, Emotional Intelligence

Recent empirical and meta-analytical studies consistently demonstrate that transformational leadership exerts significant direct effects on project outcomes in contemporary project settings. Evidence from research conducted between 2020 and 2025 shows that transformational leaders positively influence key project success indicators such as timely delivery, quality performance, stakeholder satisfaction, and overall project efficiency. These leaders provide clear vision, articulate high expectations, and inspire commitment, which directly enhance team focus and alignment with project goals. Meta-analytical findings further confirm that transformational leadership is strongly associated with improved team performance, heightened motivation, and greater adaptability, particularly in dynamic and technology-driven project environments. Overall, the direct effects highlight that transformational leadership remains a powerful predictor of project success independent of mediating or contextual factors, reinforcing its relevance in modern project management practice.

Contextual moderators such as organizational culture, team climate, trust, and emotional intelligence significantly shape the strength and direction of the relationship between transformational leadership and project outcomes in contemporary project environments. Studies show that supportive and innovative-oriented cultures amplify the positive effects of transformational leadership by encouraging openness, shared learning, and risk-taking (Kim & Park, 2021). A positive team climate—characterized by cohesion, psychological safety, and open communication further enhances leaders' ability to inspire, motivate, and align team members around project goals (Muriithi & Ahn, 2023). Trust functions as a critical contextual buffer, allowing team members to respond more strongly to leaders' vision and guidance, thereby increasing commitment and performance (Liu et al., 2022). Additionally, leaders with high emotional intelligence are better positioned to understand team needs, manage conflict, and foster deeper relational bonds, which strengthens the impact of transformational behaviors on project success (Rahman & Al-Khalifa, 2024). Collectively,

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these moderators reveal that transformational leadership is most effective when embedded within supportive socio-emotional and cultural contexts that enable teams to internalize and act on transformational cues.

3.2 Transformational Leadership and Team Performance

Transformational leadership has been widely shown to enhance team performance in contemporary project environments, particularly where teamwork, innovation, and rapid decision-making are essential. Empirical studies conducted between 2020 and 2025 demonstrate that transformational leaders strengthen team performance by articulating a compelling vision, stimulating intellectual engagement, and fostering a climate of psychological safety that encourages knowledge sharing and collaboration (Alharbi & Zakaria, 2020). Such leaders also model high ethical standards and individualized consideration, which increases team cohesion, mutual support, and collective efficacy—factors strongly linked to improved project team outcomes (Hwang et al., 2021). Furthermore, recent evidence highlights that transformational leadership boosts team adaptability and resilience, enabling members to navigate uncertainty and project complexity more effectively (Liu et al., 2022). Emotional intelligence plays a reinforcing role, with leaders who exhibit strong emotional awareness promoting better conflict management, motivation, and team harmony, ultimately translating into superior team performance (Nguyen et al., 2023). Overall, the literature affirms that transformational leadership remains a critical determinant of high-performing project teams in modern project contexts.

3.2.1 Empowerment and Motivation

Transformational leadership enhances team motivation by inspiring members to align with organizational goals, leading to improved productivity and cohesion (Ali et al., 2023). Empowerment and motivation are central mechanisms through which transformational leadership enhances team effectiveness in contemporary project environments. Transformational leaders empower team members by delegating authority, encouraging autonomy, and fostering a sense of ownership over project tasks, which strengthens individual confidence and decision-making capacity (Alharbi & Zakaria, 2020). This empowerment cultivates intrinsic motivation, as team members feel trusted, valued, and capable of contributing meaningfully to project goals. Studies conducted between 2020 and 2025 further indicate that leaders who articulate a compelling vision and provide intellectual stimulation elevate employees' internal drive to perform beyond expectations, particularly in dynamic and uncertain project settings (Hwang et al., 2021). By creating a supportive psychological climate and recognizing individual contributions, transformational leaders activate motivational processes that enhance creativity, persistence, and proactive behaviour (Nguyen et al., 2023). Overall, empowerment and motivation operate as key conduits through which transformational leadership strengthens team capacity, commitment, and sustained high performance in modern project contexts.

3.2.2 Team Processes

Communication, Cohesion and Coordination

Effective communication, trust, and coordination are strengthened under transformational leadership, resulting in better problem-solving and performance (Hwang et al., 2021). Team processes play a pivotal role in shaping the relationship between transformational leadership and successful project outcomes, particularly in complex and collaborative work environments. Transformational leaders enhance team processes by fostering open communication, establishing clear role expectations, and promoting a shared vision that aligns individual efforts with collective goals (Shao et al., 2022). These leaders also encourage knowledge sharing, joint problem-solving, and constructive feedback loops, which strengthen team coordination and adaptability critical elements for managing dynamic project conditions (Liu et al., 2022). Additionally, transformational leadership cultivates psychological safety, enabling team members to voice concerns, experiment with new ideas, and engage in high levels of interpersonal cooperation without fear of negative repercussions (Rahman & Al-Khalifa, 2024). Such supportive conditions improve cohesion, trust, and mutual accountability, thereby elevating overall team efficiency and performance. Evidence from recent studies indicates that robust team processes amplify the positive effects of transformational leadership, making them essential mechanisms for achieving high-performing contemporary project teams.

3.2.3 Adaptability, Reflexivity and Innovative

Creativity, Problem-solving and Resilience

Transformational leaders encourage reflexivity and innovation, helping teams adapt to dynamic project environments (Nguyen et al., 2023). These behaviors foster resilience during uncertainty. Adaptability, reflexivity, and innovation are critical mechanisms through which transformational leadership drives superior project outcomes. Transformational leaders foster adaptability by encouraging teams to respond flexibly to changing requirements, emerging risks, and dynamic stakeholder expectations (Nguyen et al., 2023). Reflexivity in the capacity of teams to critically evaluate their processes, assumptions, and performance enhances learning, continuous improvement, and problem-solving under transformational leadership (Liu et al., 2022). Simultaneously, innovation is stimulated when

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leaders provide intellectual stimulation, promote creative thinking, and cultivate psychological safety, enabling experimentation with novel approaches without fear of failure (Rahman & Al-Khalifa, 2024). Studies show that transformational leadership's encouragement of adaptability, reflexivity, and innovation not only improves team performance but also strengthens project success in environments characterized by uncertainty, technological advancement, and competitive pressures.

3.3 Boundary Conditions and Critiques

While transformational leadership has been widely recognized as a powerful driver of project success and team performance, recent studies highlight important boundary conditions and critiques that moderate its effectiveness. Contextual factors such as organizational culture, team climate, trust, and emotional intelligence significantly influence the extent to which transformational leadership translates into positive outcomes (Rahman & Al-Khalifa, 2024). For instance, in highly rigid or hierarchical cultures, transformational behaviors may be constrained, limiting the capacity of leaders to empower and motivate teams (Alharbi & Zakaria, 2020). Similarly, teams with low cohesion or weak psychological safety may not respond optimally to transformational leadership, highlighting the moderating role of team-level conditions (Hwang et al., 2021). Critiques of transformational leadership also emphasize its potential overreliance on leader charisma, which may overshadow the development of structural processes or lead to dependency on the leader (Liu et al., 2022). Additionally, some scholars argue that the universality of transformational leadership is context-dependent; what works in one project environment may not generalize to others, particularly across diverse cultural and technological settings (Nguyen et al., 2023). These critiques and boundary conditions underscore the need for a nuanced understanding of transformational leadership, emphasizing that its effectiveness is contingent upon both contextual and relational factors within project teams.

3.3.1 Culture and Organizational Moderators

Critiques highlight cultural and organizational moderators that constrain the universality of transformational leadership (Zhu et al., 2021). Virtual project settings also reveal limitations, where lack of face-to-face interaction weakens leader influence (Shao et al., 2022). Methodological concerns such as reliance on cross-sectional data and potential construct overlap with transactional leadership persist (Müller et al., 2022). Cultural and organizational factors serve as critical moderators in the relationship between transformational leadership and project outcomes, influencing the degree to which leadership behaviors translate into team performance and project success. Empirical evidence suggests that organizational culture, including innovation orientation, hierarchy, and support for learning, can either amplify or constrain transformational leadership effectiveness (Alharbi & Zakaria, 2020; Rahman & Al-Khalifa, 2024).

In cultures that value collaboration, open communication, and employee empowerment, transformational leaders are more likely to inspire engagement, motivate team members, and foster innovative solutions, resulting in higher project performance. Conversely, in rigid or highly hierarchical organizational contexts, transformational behaviors may be limited by structural constraints, reducing leaders' ability to empower and motivate their teams effectively (Hwang et al., 2021). Cross-cultural differences also shape the perception and impact of transformational leadership; leaders who exhibit cultural intelligence and adapt their style to diverse team norms and values enhance trust, cohesion, and knowledge sharing among multicultural teams (Nguyen et al., 2023). These findings underscore the importance of considering both cultural and organizational moderators when evaluating the effectiveness of transformational leadership in contemporary project environments, highlighting the context-dependent nature of leadership impact.

3.3.2 Limitations in Virtual/Remote Contexts

Transformational leadership faces distinct limitations in virtual and remote project environments. First, the reduced richness of computer-mediated communication weakens leaders' ability to convey core behaviors such as idealized influence and inspirational motivation, which typically rely on face-to-face presence, emotional cues, and relational immediacy (Purvanova, 2021). The absence or delay of non-verbal feedback tone, facial expressions, and gestures can hinder trust-building and reduce the leader's capacity to accurately gauge team morale and individual needs (Zimmermann et al., 2020). In addition, virtual settings often lead to communication overload, digital fatigue, and fragmented interactions, which complicate individualized consideration and diminish opportunities for informal mentorship (Liao, 2022). Remote work also amplifies cultural and temporal differences across globally distributed teams, making it harder for transformational leaders to create shared vision, collective identity, and psychological safety (Plotnick et al., 2023). Finally, technological disparities, unequal access, skills, or reliability can further constrain leaders' influence and weaken the consistency of transformational behaviors across the team.

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3.3.3 Methodological Concerns

Common Method Bias

Research on transformational leadership and project outcomes often relies heavily on self-reported or single-source survey data, raising concerns about common method bias (CMB). When predictors and outcomes are collected from the same respondents at the same time, the observed relationships may be artificially inflated due to shared measurement context rather than true theoretical associations (Podsakoff et al., 2012). Factors such as social desirability, consistency motifs, and respondents' mood states can distort results, making transformational leadership appear more strongly related to team performance or project success than it is. Many studies inadequately address CMB, often relying solely on post-hoc statistical checks such as Harman's single-factor test, which is insufficiently sensitive. Methodological rigor can be enhanced by using multi-source data by collecting leadership ratings from team members and performance outcomes from supervisors, temporal separation of measures, or statistical techniques such as latent method factor modeling to minimize CMB risks.

Construct Overlap

Another methodological concern arises from construct overlaps between transformational leadership and related concepts such as empowering leadership, ethical leadership, or charismatic leadership. These leadership constructs often share conceptual domains—e.g., vision communication, motivation, and individualized support which can lead to redundancy in measurement instruments. Overlapping items blur theoretical boundaries, making it difficult to attribute observed effects specifically to transformational leadership. This overlap reduces discriminant validity and increases the likelihood of multicollinearity in regression and structural equation models, thus complicating interpretation. In project contexts, where leadership behaviors interact with team dynamics, context variables, and task characteristics, construct contamination may inflate or mask the true relationships between transformational leadership and project outcomes. To address this, scholars emphasize using validated measurement tools, conducting confirmatory factor analyses to test discriminant validity, and integrating theoretically distinct constructs into more comprehensive leadership models.

3. 4 Synthesis and Directions for Future Research

The reviewed studies affirm that transformational leadership enhances both project success and team performance. However, gaps remain in longitudinal and experimental designs that could better establish causality. Future research should explore hybrid and virtual project teams, cross-cultural comparisons, and industry-specific applications. The reviewed literature from 2020 to 2025 demonstrates that transformational leadership exerts a profound influence on project outcomes and team performance through mechanisms such as empowerment, motivation, team processes, adaptability, reflexivity, and innovation (Alharbi & Zakaria, 2020; Liu et al., 2022; Nguyen et al., 2023; Rahman & Al-Khalifa, 2024). Evidence consistently indicates that transformational leaders enhance team cohesion, psychological safety, and proactive problem-solving, resulting in improved project efficiency, effectiveness, and overall success. However, the literature also highlights several boundary conditions, including organizational culture, team climate, trust, and emotional intelligence, which moderate the effectiveness of transformational leadership and underscore its context-dependency (Hwang et al., 2021; Rahman & Al-Khalifa, 2024). Critiques point to potential overreliance on leader charisma, challenges in sustaining influence across diverse cultural and technological environments, and gaps in understanding long-term impacts on project sustainability and innovation (Liu et al., 2022; Nguyen et al., 2023).

Future research should explore how transformational leadership interacts with emerging digital tools and hybrid project structures, particularly in technology-intensive and multicultural teams. Longitudinal studies are recommended to assess the enduring effects of transformational behaviors on team resilience, innovation, and project sustainability. Additionally, there is a need to investigate context-specific moderating variables, such as sectoral differences, virtual team dynamics, and organizational complexity, to provide a more nuanced understanding of when and how transformational leadership produces optimal outcomes. By addressing these gaps, future studies can inform evidence-based leadership practices that enhance project performance, team effectiveness, and adaptability in increasingly volatile, uncertain, complex, and ambiguous (VUCA) project environments.

3.5 Practical Implications

The accumulated evidence on transformational leadership offers several practical implications for project managers, organizations, and policymakers aiming to enhance team performance and project success in contemporary environments. First, leaders should prioritize empowerment and motivation strategies, such as delegating authority, fostering autonomy, and recognizing individual contributions, to enhance intrinsic motivation and proactive engagement among team members (Alharbi & Zakaria, 2020; Nguyen et al., 2023). Second, cultivating robust team processes, including open communication, knowledge sharing, and coordinated problem-solving can translate transformational behaviors into tangible improvements in project performance, particularly in complex and dynamic settings (Hwang et

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al., 2021; Liu et al., 2022). Third, organizations should consider context-specific factors, such as culture, team climate, and emotional intelligence, when designing leadership development programs, as these moderators significantly influence the effectiveness of transformational leadership (Rahman & Al-Khalifa, 2024). Additionally, fostering adaptability, reflexivity, and innovation within teams is essential for responding to rapidly changing project demands and technological advancements. Practically, this may involve training leaders to provide intellectual stimulation, encourage reflective practices, and support creative experimentation. By implementing these evidence-based strategies, organizations can create high-performing project teams that are resilient, innovative, and capable of achieving sustainable project outcomes in volatile, uncertain, complex, and ambiguous (VUCA) environments.

IV. CONCLUSION

4.1 Conclusion

The review concludes that contemporary projects require transformational leadership for both project success and team performance. Its ability to inspire, motivate, and develop team members enables project teams to navigate complexity and achieve superior outcomes. However, existing research remains constrained by methodological limitations and insufficient exploration of contextual variables that influence leadership effectiveness. Strengthening future studies through longitudinal designs, experimental approaches, and a focus on virtual and multicultural project teams will provide a more comprehensive understanding of how transformational leadership operates across different contexts. Overall, organizations and project managers stand to benefit greatly from adopting transformational leadership practices that cultivate empowered, innovative, and high-performing teams.

Recap of Main Message

The literature from 2020 to 2025 demonstrates that transformational leadership significantly influences project outcomes by enhancing team performance, motivation, empowerment, adaptability, reflexivity, and innovation (Alharbi & Zakaria, 2020; Liu et al., 2022; Nguyen et al., 2023). Transformational leaders foster psychological safety, knowledge sharing, and creative problem-solving, which contribute to improved team cohesion, efficiency, and overall project success. Team processes and contextual moderators, including organizational culture, trust, team climate, and emotional intelligence, further determine the effectiveness of transformational leadership, emphasizing that its impact is contingent upon both team- and organization-level factors (Hwang et al., 2021; Rahman & Al-Khalifa, 2024).

Final Remarks on the Importance and Context-Sensitivity of Transformational Leadership in Projects

Transformational leadership is both highly important and context-sensitive in contemporary project settings. Leaders who adapt their behavior to cultural, organizational, and technological contexts are better positioned to achieve sustained project success, particularly in remote, multicultural, and complex environments. By integrating empowerment, innovation, and adaptive strategies, transformational leaders enhance team resilience, engagement, and long-term sustainability. These findings highlight the necessity for organizations to develop leadership development programs that are sensitive to contextual nuances, equipping leaders to navigate volatile, uncertain, complex, and ambiguous (VUCA) project landscapes effectively (Rahman & Al-Khalifa, 2024; Nguyen et al., 2023).

4.2 Recommendations

Project managers should also apply transformational leadership behaviors that build trust, promote innovation, and strengthen team cohesion, while organizations invest in leadership development programs to ensure adaptive, high-performing, and resilient project teams.

Declaration of Interest

The author declares that she does not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

Ahmad, M. K., Abdulhamid, A. A., Wahab, S. A., & Nazir, M. U. (2022). Impact of the project manager's transformational leadership, influenced by mediation of self-leadership and moderation of empowerment, on project success. *International Journal of Management, Projects, and Business, 15*, 842–864. https://doi.org/10.1108/IJMPB-03-2021-0066

Alharbi, M., & Zakaria, N. (2020). Transformational leadership and project team effectiveness in IT-based environments. *International Journal of Project Management, 38*(7), 412–423. https://doi.org/10.1016/j.ijproman.2020.06.005

Ali, A., Khan, M., & Mahmood, S. (2023). Transformational leadership and team performance in project-based organizations. *Journal of Project Management, 38*(2), 115–130.

Bass, B. M., & Riggio, R. E. (2021). *Transformational leadership* (3rd ed.). Routledge.

Fareed, M. Z., Su, Q., & Aslam, M. U. (2023). Transformational leadership and project success: The mediating role of psychological empowerment. *SAGE Open, 13*, 21582440231154796. https://doi.org/10.1177/2158244023115479

Han, H., Ma, F., & Liu, X. (2024). Transformational leadership and project success: The serial mediating roles of team flexibility and team agility. *Frontiers in Built Environment, 9*. https://doi.org/10.3389/fbuil.2023.1334413

Hwang, H., Kim, J., & Lee, S. (2021). Team climate as a predictor of the transformational leadership–team performance relationship. *Journal of Leadership & Organizational Studies, 28*(4), 543–556. https://doi.org/10.1177/15480518211012021

Jiang, S., Ling, F. Y. Y., & Ma, G. (2024). Fostering resilience in project teams: Adaptive structuration perspective. *Journal of Management in Engineering, 40*(4), 04023047.

Kim, S., & Park, J. (2021). Organizational culture as a moderator of transformational leadership and project performance. *Journal of Project Leadership, 15*(2), 45–60.

Liao, C. (2022). Leadership in virtual teams: A review of the literature and future research directions. *Small Group Research, 53*(1), 3–40. https://doi.org/10.1177/1046496420986029

Liu, H., Zhang, Y., & Chen, L. (2022). Trust as a contextual condition for effective transformational leadership in project teams. *International Journal of Project Management, 40*(4), 312–324.

Liu, X., Kassa, A., & Tekleab, A. G. (2025). Are intrateam trust and organizational trust substitutable? Effects on team reflexivity, engagement, and performance. *Journal of Business Research, 189*, 115164. https://doi.org/10.1016/j.jbusres.2024.115164

Liu, Y., Chen, X., & Fang, T. (2022). Transformational leadership and adaptive team performance: The mediating role of trust and team learning. *Engineering Management Journal, 34*(3), 175–186.

Liu, Y., Zhang, Z., & Wang, J. (2022). Mediating effects of trust in transformational leadership and project outcomes. *Project Leadership & Society, 3*(1), 22–35.

Müller, R., Turner, J. R., & Drouin, N. (2022). Project leadership and performance: A meta-analysis. *International Journal of Project Management, 40*(3), 245–262.

Muriithi, J., & Ahn, S. (2023). Team climate and its moderating role in the leadership–performance relationship. *Project Management Review, 28*(1), 77–92.

Nguyen, T., Vo, D., & Le, H. (2023). Team empowerment and leadership in dynamic project environments. *Journal of Leadership in Projects, 12*(1), 54–72.

Pavez, I., Gómez, H., Laulié, L., & González, V. A. (2021). Project team resilience: The effect of group potency and interpersonal trust. *International Journal of Project Management, 39*, 697–708. https://doi.org/10.1016/j.ijproman.2021.06.004

Plotnick, L., Esbensen, M., & Hiltz, S. R. (2023). Challenges of distributed teamwork and implications for leadership in virtual environments. *International Journal of Information Management, 69*, 102587. https://doi.org/10.1016/j.ijinfomgt.2022.102587

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology, 63*, 539–569.

Purvanova, R. K. (2021). The silent assassins of remote work: A review of virtual work challenges and implications for leadership. *Organizational Dynamics, 50*(4), 100822. https://doi.org/10.1016/j.orgdyn.2021.100822

Rahman, M. M., & Al-Khalifa, K. (2024). Cultural context and transformational leadership: Effects on contemporary project outcomes. *International Journal of Managing Projects in Business, 17*(2), 289–306. https://doi.org/10.1108/IJMPB-11-2022-0307

Sahin, N., & Bilir, F. P. (2024). The effect of transformational leadership and personal cultural values on creating a learning organization. *Humanities & Social Sciences Communications, 11*, 1–9. https://doi.org/10.1057/s41599-024-02701-6

Licensed Under Creative Commons Attribution (CC BY-NC)

Shao, J., Müller, R., & Turner, J. R. (2022). Transformational leadership in virtual project teams: Challenges and opportunities. *International Journal of Managing Projects in Business*, *15*(2), 301–320.

Wang, G., & Howell, J. M. (2022). Cultural values and leadership effectiveness in projects: A cross-cultural perspective. *Leadership Quarterly*, *33*(1), 101–115.

Zhu, J., Liao, Z., Yam, K. C., & Johnson, R. E. (2021). Revisiting transformational leadership in modern organizations: A multilevel review. *Academy of Management Annals*, *15*(1), 29–65.

Zimmermann, P., de Wit, A., & Jessup, L. (2020). Communication dynamics in virtual teams: Examining the role of leadership and media richness. *Group & Organization Management*, *45*(6), 807–838.

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The community lived experiences of sanitation in the peri-urban areas of Lusaka, Zambia

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ABSTRACT

The study is significant as it contributes to Sustainable Development Goal number 6, for which countries are expected by 2030 to achieve sanitation services for all the citizens. In response to the global vision and also in alignment with the National Water and Sanitation Policy, the government has implemented a number of sanitation interventions across the country and in Lusaka peri-urban areas. The objective of this paper was to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas. The study adopted an interpretive phenomenological paradigm, anchoring on the relativist ontology, which posits that there is no single reality but rather multiple realities in the understanding of sanitation challenges. The paper was informed by the 29 participants, disaggregated as 10 males, 15 women, and 4 key informants. The data was analyzed using a reflexive thematic analysis, which was used in line with Braun and Clarke's framework for thematic analysis. The study found that due to limited demand for the pit emptying services, the pit emptier's are sometimes forced to move to other to leverage business opportunities hence they are expected to get either new operating license for that area or probably sign a new service contract; hence, this raises the cost of doing business. Moreover, the study disclosed that there are no dedicated structures to deal with sanitation, given that the community-level structures, such as the D-WASH, Water and Sanitation committees, are neither well-coordinated at the community level nor integrated into the sanitation programs. Moreover, the study uncovered that culture is embedded in sanitation and affects pit emptying services because women use pit latrines to dispose menstrual pads, hence when they fill up, the women tend to be uncomfortable to allow emptying of the toilets. The study concludes that there is a need for policymakers to consider a single operating licensing regime to ease the cost of operations for the service providers. This policy direction will improve sanitation in most of the peri-urban areas of Lusaka.

Keywords: On-Site Sanitation, Pit Emptying Services, Sanitation Challenges, Sanitation Regulations

I. INTRODUCTION

Most of the peri-urban areas face unique sanitation challenges, particularly at the household level, which often has compromised public health and safety in different areas. To understand these challenges, this paper was guided by an objective that sought to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas. This section covers the study background, methodology, findings, conclusion, and recommendations. The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2019). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewered network. Thirteen percent of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered as 'unimproved' sanitation facilities (National Water Supply and Sanitation Council [NWASCO], 2018).

Globally, most governments, including Zambia, are committed to the Sustainable Development Goals (SDGs) and the African Union's Agenda 2063. Sustainable Development Goal 6 is to ensure the availability and sustainable management of safe water and sanitation for all by 2030. The water and sanitation goals are defined by eight targets that specify the objectives, and progress towards the 2030 Agenda for Sustainable Development is measured using 11 indicators as metrics by which the world aims to track whether these targets are achieved (Rajapakse et al., 2023). A study conducted by the United Nations (2015) shows that most countries are not on track to meet their objective of ensuring the availability and sustainable management of water and sanitation for all. The United Nations General Assembly (2010) posits that water and sanitation are recognized as human rights under international law. Furthermore, international monitoring data show that the world still has a long way to go to ensure everyone has access to safe services (Howard, 2021). According to a study conducted by Kivunja & Kuyini (2017), over 2.3 billion people all over the world still lacked basic sanitation service, and 844 million people still lacked basic drinking water. According to the global statistics, there are an estimated 3.4 billion people, or 45% of the population, who used safely managed sanitation services in 2017 (World Health Organization & United Nations Children's Emergency Fund [WHO/UNICEF], 2019).

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Moreover, the World Health Organization and UNICEF (2019) established that the available data are limited, and the national estimates were only available for 96 countries, representing 54% of the global population.

Regionally, water and sanitation are anchored on Agenda 2063, whose aspiration is that Africa shall have equitable and sustainable use and management of water resources for socio-economic development, regional cooperation, and the environment (Agenda 2063, 2015). Moreover, global think tank institutions, such as the World Health Organization, observed that safe water and sanitation are essential to the health of all Africans as well as to the social and economic development of their countries, yet millions lack access to both.

Nationally, the country's water and sanitation regulatory institution, the National Rural Water Supply and Sanitation Program (2006), reveals that inadequate water and sanitation infrastructure is mainly due to low financial investments in the sector, with an annual allocation of less than 3% of the national budget. Moreover, the National Rural Water Supply and Sanitation Program (2006) further notes that the investments have been skewed towards water supply as opposed to sanitation, and this situation has been compounded by a lack of a clear policy on sanitation issues. Subsequently, Zambia has developed a comprehensive policy to guide the development and management of the sanitation and water sectors. The specific policy measures for rural water supply and sanitation include a community-based approach, the promotion of appropriate technology, and capacity building at all levels (National Rural Water Supply and Sanitation Program, 2006). The study aim was to explore sanitation programs' lived experiences among the stakeholders in Lusaka's George Compound.

1.1 Statement of the Problem

The Government of Zambia remains committed to accelerating universal access to water supply and sanitation to achieve a healthy and productive nation (National Water and Sanitation Council, 2018). Pit latrines are the dominant form of sanitation in peri-urban areas, used by about 88% of households (ECA, 2018). Thus, to improve public health, the government, with support of AfDB, constructed 5000 household toilets in peri-urban areas (Brown et al., 2012).

The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2012). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewered network. 13% of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered as 'unimproved' sanitation facilities (National Water and Sanitation Council, 2018).

Moreover, in most peri-urban areas, poor infrastructure and weak regulatory enforcement exacerbate sanitation issues (Lerebours et al., 2021). Equally, the roles and enforcement mandates among key regulatory actors remain poorly defined, resulting in fragmented implementation of sanitation laws and standards (SNV, 2024).

As a result of the poor sanitation situation in Lusaka, there have been recurrent outbreaks of cholera, typhoid, and dysentery, contributing to significant morbidity and mortality (Brown et al., 2012). Furthermore, the disease outbreak makes the government lose an estimated US$194 million annually due to poor sanitation—equal to 1.3% of Gross Domestic Product [GDP]. (Brown et al., 2012). Similarly, approximately 3.4 million deaths occur each year from water-related diseases at a global level (WHO/UNICEF, 2017). Therefore, the researcher explored the stakeholder's lived experiences in sanitation programs in Lusaka's George Compound.

1.2 Study Purpose

The study purpose was to explore sanitation programmes lived experiences among the stakeholders in Lusaka's George Compound.

1.3 Research Objective

The study was guided by the objective, which sought to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas.

1.4 Research Question

The study answered the research question: What are the beneficiaries' perceived sanitation challenges in Lusaka's peri-urban areas?

II LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Systems Theory

The researcher adopted the Systems theory which was first introduced in the 1940s by biologist Ludwig von Bertalanffy. Systems theory is a conceptual framework which is based on the principle that the component parts of a system can best be understood in the context of their relationships with each other and with other perceiving parts of the systems, rather than in isolation. (Wilkinson, 2011). Systems theory has significantly influenced our understanding of organisational behaviour and change, and a system approach can increase our ability to identify the underlying causes

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of problems and determine the optimal solution. (Wilkinson, 2011). Systems thinking is the examination of systems from the perspective of the entire system, interrelated subsystems, and repetitive patterns occurring among subsystems. Systems thinking provides a holistic analytical method to analyse how a system's integral components relate and function over time and within the context of larger systems. Systems thinking is useful for complex or complicated problems that cannot be solved by a single entity, because complex systems cannot be effectively understood from only one perspective (Beehner, 2025).

The theory is in alignment with the study's ontological position, which holds that reality is multiple, which requires understanding of the whole by its various parts. In this context, applying systemic thinking helped in understanding various stakeholders' experiences of sanitation programme implementation as well as how systems interact to address sanitation programme challenges in the study area, thus helping the researcher in the interpretation and in the discussion of findings.

2.2 Empirical Review

2.2.1 Limited Systematic Investigation on Access and Availability FSM Services

A study conducted by Kakar et al. (2023) disclosed that, despite an obvious need for safe fecal sludge emptying, treatment, and disposal in such settings, there has been little systematic investigation of the availability and access to safe fecal sludge management (FSM) services for pit latrine owners in developing country cities. Similarly, there has been limited systematic study of households' emptying and replacement behaviors to understand the factors associated with unsafe emptying and the challenges and constraints of poor urban residents in managing full latrines. In view of the little available studies done, this study explored participants' experiences with the pit-emptying services in the study area, thus bridging a knowledge gap in the study area.

2.2.2 Low Demand for Pit Emptying Services

Through surveys of 942 households and a real-money voucher trial with 646 households, we found that stated and revealed demand for formal emptying services were both low, with less than 20% of households willing to pay full market prices. Our results suggest that improving fecal sludge management in these neighborhoods via the private sector will require large subsidies, ranging from 55.1–81.4 million KES (551,000–814,000 USD) annually, to address the gap between willingness-to-pay and market prices. Raising and administering subsidies of this scale will require the development of a city-wide sanitation master plan that includes investment, management, and regulatory procedures for fecal sludge management. In the absence of government investment and coordination, it is unlikely that the private sector will address safe sanitation needs in low-income areas of Kisumu (Peletz et al., 2020). The above study notes the logistical challenges and limited demand for formal pit emptying services faced in the sanitation services, particularly in Kenya, creating a contextual gap since limited studies have been conducted in Lusaka, George Compound.

2.2.3 Expensive and Unavailable Pit Emptying Services

A study conducted by Kakar et al. (2023) revealed that most residents in Dar's unplanned settlements use unhygienic methods to empty their latrines and do not empty pits as often or as thoroughly as they should, partly to save money or because they cannot afford better and partly because hygienic services are unavailable to them. As a result, populations are regularly exposed to fecal sludge in overly full pits during use and from frequent releases into local communities. Appropriately scaled hygienic emptying and haulage services based on operationally viable manual or mechanical pump technologies that can extract sludge from existing latrine pits in dense unplanned communities and move it from the plot to a controlled discharge point are part of the solution to the current problem. A large latent demand for such services was measured in Dar, including willingness to pay varying amounts up to and beyond the estimated small-business costs of delivering services by over 50% of property owners. However, without sustainable financing mechanisms to subsidize the service for the poorest owners, and make payment more affordable by spreading costs over multiple frequent payments for most others, and eventually regulatory efforts to promote the use of safe services and regular emptying, demand and uptake of services is unlikely to materialize at the scale and frequency needed to resolve FSM problems in Dar through the market alone.

2.2.4 Limited Spaces for Pit Latrines

Another study conducted by Greene et al. (2021) revealed that the urban facilities typically need to be emptied due to space constraints, which limit capacity for rebuilding new facilities. On the other hand, rural onsite sanitation facilities potentially can be safely decommissioned when they fill up. However, a single cycle of decommissioning full pits will affect over 400 million latrines, serving a population of 2 billion. In this scenario, this population will rely on latrines being constructed—with the potential for slipping back temporarily, or even permanently, to open defecation. As such, all onsite facilities were considered as requiring sludge removal in this assessment. This study will also explore the beneficiaries' experiences with pit-emptying challenges in the study area, thereby contributing to empirical evidence peculiar to the study area.

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2.2.5 Limited Access Challenges

Non-mechanized emptying exists in countries with dry, inaccessible facilities, or facilities that may have trash, preventing their emptying using conventional means. Non-mechanized facilities are emptied by using buckets, shovels, and garden tools, and are often performed by informal businesses that indiscriminately dispose of waste. Improvements in this emptying servicing segment represent an urgent area of intervention (Greene et al., 2021). The study also focused on non-mechanized emptying methods, hence the study explored beneficiaries' experiences or views on these interventions in the study, contributing to empirical evidence in the study area where little is known about the subject matter.

Another study conducted by Chumo (2021) revealed that in Nairobi's informal settlements, there are several mechanical emptying services, but many parts of the settlements are inaccessible to desludging vehicles, even where long extension hoses are used. This is consistent with the above study, although little studies have been conducted in the study area, thus creating a contextual gap.

2.2.6 Lack of Coordination of Stakeholders in Sanitation Value Chain

A further study conducted by Chumo (2021) disclosed that, more importantly, sanitation stakeholders are not coordinated along the sanitation value chain so that emptiers in the informal settlements are licensed. There is limited empirical evidence to ascertain if the informal pit emptiers are licensed; hence, this study helped in filling the empirical evidence in the study area.

2.2.7 Exposure to Health Risk

Manual pit emptiers are exposed to risks, and some of them experience poor health conditions associated with their working conditions and a lack of collaboration of stakeholders linked to health, safety, and lack of PPE of pit emptiers (Chumo, 2021). The above study conducted in Kenya concluded that there is lack of collaboration of stakeholders linked to health, safety, and lack of PPE of pit emptiers. This study explored these aspects, thus contributed to empirical evidence which is limited in the study area. While the data demonstrate that latrine replacement has been and will continue to be a choice of some households in Dar, full latrines are increasingly being emptied rather than replaced. The high prevalence of unsafe emptying—over three quarters of emptying events—combined with increasing rates of emptying, point to access to safe pit-emptying services being at least as important as access to sanitation facilities to protect the population from exposure to faecal pathogens (Jenkins et al., 2015a). Similarly, this study explored whether the above challenges were also experienced in the study area.

2.2.8 Solid Waste into Pit Latrines

Solid waste such as "needles, bottles, and broken glass" (FGD, male emptier) was disposed of in the pits, leading to more rapid fill-up and posing safety risks to emptiers, while hindering pump-emptying. Additionally, five tenants noted that they discharged faecal sludge into nearby ditches to avoid emptying fees. To prevent inappropriate toilet management, the public sector, NGOs, and international organizations have provided households with education about "the importance of WASH" and "why (households) need to pay for sanitation" (KII, public officials) (Tomoi et al., 2025). The study conducted in Nairobi, Kenya, disclosed that inappropriate toilet management such as solid waste leads to quick filling of the toilet and hinders pump emptying. Moreover, people discharge fecal in the nearby ditches to avoid emptying fees. However, there are limited studies that have been conducted in the study area. It explores the people's challenges of pit emptying in the area, creating empirical gaps, which this study explored in George Compound.

2.2.9 Fill Up Time and Poor Emptying Services

Moreover, for sanitation, results showed that the main challenges faced are septic tanks filling up within short periods, the cost and poor pit latrine emptying services, and poor construction of pit-latrines, among other things. This study concludes that the inadequacy in the provision of water and sanitation by LWSC, given the population increase and growth of new settlements, leads to on-site provision of water and sanitation by residents. This is, however, unsustainable and may cause both environmental and health problems due to the increase in the number of boreholes drilled and septic tanks built. As such, there is need to come up with a more sustainable way of providing these services to residents as areas are planned (Chipuwa, 2019). The above study was conducted in Kwamwena in Lusaka; however, there is no similar study that has been conducted in the study area, creating a knowledge gap, and moreover, the study was conducted in 2019 and very little studies have been conducted in the study area, creating a time frame gap. Moreover, there is a gap in sustainability on the on-site sanitation, creating a gap in this aspect.

2.2.10 Poor Management of Faecal Sludge

Additionally, in sub-Saharan Africa, on-site technologies are used by 65–100 per cent of the urban population. Faecal sludge is often poorly managed, which can create environmental and public health risks; these are intensified in settlements that are unplanned and informal in nature (Kennedy-Walker et al., 2015). People's perceptions, knowledge,

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and reported behaviors regarding WaSH facilities such as latrines reflect their knowledge of healthy WaSH practices. Due to inadequate knowledge on the importance of improved sanitation and hygiene, some people are reluctant to change their behavior and learn how to use the introduced latrine facilities (Chunga et al., 2016; Sibiya & Gumbo, 2013). This was seen in places where community members practiced open defecation. There are limited studies that have been conducted to explore stakeholders' knowledge on improved sanitation, particularly house facilities; hence, this study contributed to knowledge on the above nuances by exploring people's understanding in the area on the sanitation facilities.

III. METHODOLOGY

3.1 Research Paradigm

The study was anchored on the Phenomenology paradigm and viewed reality from a relativist ontology that believes in multiple realities. Scotland (2012) asserts that reality is relative to how individuals experience it at any given time and place. According to Scotland (2012), ontology is defined as a branch of philosophy concerned with the assumptions we make to believe that something makes sense or is real, or the very nature or essence of the social phenomenon we are investigating. Therefore, collaborating with the above definition, the researcher studied reality by integrating multiple perspectives. Moreover, in terms of epistemology, the researcher adopted a subjective epistemological stance in which knowledge is generated through my personal experiences and interaction with participants (Kivunja & Kuyini, 2017). Using this epistemological stance, the study generated knowledge through interpreting meaning from the participants' experiences. Further, the study adopted a value-bound axiological stance, hence acknowledging that one's positionality in terms of personal background, experience, values, and beliefs influenced the study while prioritizing ethical considerations. (Kivunja & Kuyini, 2017) define axiology as the ethical issues that need to be considered when planning a research proposal. Given the nature of the study approach adopted, the research was value bound, hence was part of what was being researched and could not be separated (Saunders et al., 2009). Therefore, positionality in this study helped in integrating my beliefs and experiences in the construction of meaning during the study.

Lastly, the research deployed a methodology stance which covered the research approaches, designs, methods, and procedures used in an investigation that is well planned to find out something (Keeves, 1997). The inductive reasoning is a logical process in which multiple premises, believed true or found true most of the time, are combined to obtain a specific conclusion or to supply evidence for the truth of conclusion (Sauce & Matzel, 2017). The study applied inductive logic in data collection and data analysis by reasoning from the specific that were participants sampled to the general study area.

3.2 The Research Design

The study adopted the exploratory case study to gain in-depth insights about sanitation by focusing on a single case. Gerring (2004) emphasises that a case study is an intensive study of a single unit for understanding a larger class of (similar) units where the unit connotes a spatially bounded phenomenon observed at a single point in time or over some delimited period. According to Cresswell (2007), a case study is a good approach when the inquirer has identifiable cases with boundaries and seeks to provide an in-depth understanding of the cases or a comparison of several cases.

3.3 Sampling, Location, Population and Procedure

3.3.1 Study Location

The study was conducted in George Compound, one of the peri-urban areas located west of Lusaka. The location was selected based on the sanitation programmes, which involved the construction of household toilets. The programme was implemented there by the government of Zambia through the Lusaka Sanitation Program.

3.3.2 The Study Population

The study population is defined as a set of cases, determined, limited, and accessible, that constituted the subjects for the selection of the sample, and must fulfill several characteristics and distinct criteria (Arias-Gómez et al., 2016). The study sampled the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department). The population was selected based on the participants' experiences working on the sanitation programmes in the peri-urban areas.

3.3.3 The Study Sample Size

The study adopted a qualitative research approach in which the sample size was determined based on the principle of data saturation. Suri (2011) notes that data saturation is associated with the situation when a further

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collection of data provides little in terms of 'further themes, insights, perspectives or information'. The study sample size was 29 participants disaggregated as 10 males, 15 women, and 4 key informants. The sample size was determined in the field after reaching data saturation, when no more new insights were emerging.

3.3.4 Sampling Procedure

The purposive sampling was employed, which is the intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon (Robinson, 2014). Furthermore, the criterion-based purposive sampling was employed in this study. This type of sampling calls for the researcher to set a specific criterion which should be followed for participants to take part in the study.

These participants were handpicked for such reasons because the criterion is set to enable the relevant data to be collected (Haruna, 2023). Samples were selected from the participants who have experienced and benefited from the sanitation programmes that were implemented by the government for the past ten years. The government stakeholders were selected based on their experience implementing sanitation programmes in the study areas. The selected study participants comprised the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department).

3.4 Data Collection Instruments

The collection of primary raw data from the field was based on the deployment of the key informant interviews targeting government officials and community opinion leaders, and the in-depth interviews targeting the sanitation programmes beneficiaries.

3.4.1 Key Informant Interviews

Key informant interviews were deployed based on its quality to conduct intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation. This choice of data-collecting tool is appropriate for open-ended questions for a qualitative study that were intended to be used. The key informant interviews (KIIs) are a valuable qualitative research method aimed at collecting in-depth insights and viewpoints from individuals who possess specialised expertise in a particular field. This method involved conducting one-on-one interviews with key informants to gain a comprehensive understanding of their knowledge, experiences, and perspectives, thus providing valuable qualitative data for research and analysis (Akhter, 2022). The study deployed this method targeting the government officials and community leaders based on their experience working in the sector or experiencing the sanitation programme interventions in the study area.

3.4.2 In-Depth Interviews

The study also deployed in-depth interviews to generate qualitative data. The in-depth interviews can be quite unpredictable and varied and are well suited to exploratory research and other research interested in meaning and experiences (Osborne & Grant-Smith, 2021). The data collection instrument is suited for this study as it leans on gathering sanitation beneficiaries' lived experiences in an unrestricted manner as opposed to structured instruments which restrict participants' responses.

3.4.3 Data Collection Procedures

Self-administered interviews were deployed in the field to elicit the participants' views and experiences. The interviews were conducted either in English or translated into the local language spoken by the participant. The study participants to be interviewed were selected using the criterion of purposive sampling. The interview duration lasted between 50 to 60 minutes. Data collection devices such as audio recording were used after obtaining consent from the study participants.

3.5 Data Analysis

Raw data manually analysed using a reflexive thematic analytical research approach in line with the study philosophical paradigm. According to Kiger and Varpio (2020), thematic analysis is an appropriate method of analysis for seeking to understand experiences, thoughts, or behaviours across a data set. Themes are actively constructed patterns (or meanings) derived from a data set that answer a research question, as opposed to mere summaries or categorisations of codes. The study adopted the Braun and Clarke framework for conducting thematic analysis, which involves a six-step process namely data familiarization, generating initial codes, themes identification, reviewing themes, defining and naming themes, and producing the report (Kiger & Varpio, 2020). The above themes helped in building patterns for interpreting the study findings in line with the study objectives and study purpose.

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3.6 The Study Trustworthiness

The study employed Lincoln and Guba's criteria to ensure trustworthiness of the study. The scholars identified four criteria of credibility, transferability, dependability, and confirmability, and this is according to Ahmed (2024). Ahmed (2024) notes that credibility and trust are built through rapport with participants over time, which allowed the researcher to gain deeper insights into their experiences, behaviours, and beliefs. The foregoing approach was employed, which helped the researcher capture rich data that might not emerge during brief interactions. Moreover, the study achieved transferability by thoroughly describing the research context, participants, and methods, allowing readers to assess similarities between my study and their own contexts and judge whether the findings might apply to their settings (Ahmed, 2024). The study also detailed the sampling methods and participant selection criteria so others could determine if the findings might transfer to similar populations or settings. Ahmed (2024) observes that documenting each step of the research process to ensure transparency and allow others to replicate the study or assess the reliability of the findings. Furthermore, according to Kakar et al. (2023), dependability refers to the consistency of findings over time. Moreover, Eryilmaz (2022) postulates that maintaining an audit trail—a detailed log of decisions made throughout the research—allows other researchers to reproduce the study, ensuring dependable results. Finally, the study ensured confirmability through member checking, giving participants the opportunity to verify that their viewpoints and experiences were accurately represented. Furthermore, Ahmed (2024) postulates that keeping a reflective journal helped to track my evolving thoughts, biases, and reflections during the research process. This practice enhanced transparency and provided insights into my own subjectivity, contributing to the confirmability of the findings.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Theme 1.1.1: Limited Access to Sanitation

The study revealed that most peri-urban areas do not have access to sewer systems, hence they depend on pit latrines. The people in the peri-urban areas face the challenges of pit emptying when the toilets fill up, as well as face the challenge of space for constructing new toilets whenever they fill up. One of the key informants disclosed that:

> *In terms of access to sanitation, the experience has been that most peri-urban areas do not have sewer networks, hence they depend on pit latrines. When the toilets are full, the main challenge has been to open them, and usually, when full, they tend to abandon them and dig new ones. In other areas where they don't have toilets, they ask to use toilets for their neighbours, which most of the time creates conflicts in the areas. Most of the peri-urban areas have challenges of space for constructing pit latrines.* (Verbatim- KII LWSC).

The main challenge faced with sanitation is limited access to sanitation facilities and emptying services. There is also limited information and awareness about the sanitation products that are available. One of the key informants disclosed that:

> *The number one challenge faced in sanitation is limited information, of which very few people are aware that LWSC is offering pit emptying services in terms of cost for the service, the call centre or toll-free line. The available information is not reaching every house in the peri-urban areas.* (Verbatim- KII LWSC).

Moreover, there is lack of access in terms of roads. One of the key informants expressed that:

> *The service providers park their big trucks and use push carts during pit emptying services in most peri-urban areas. This means that the service providers ask for additional cost. Similarly, some of the service providers do discriminate against those beneficiaries who cannot be accessed due to bad roads and opt to provide service to those who are accessible. (Verbatim- KII LWSC).*

Furthermore, if the people are abused by the service providers, they may not know where to report. One of the key informants disclosed that:

> *Moreover, if the toilet is not built according to standards, the pit emptier may not empty it due to safety concerns. (Verbatim- KII LWSC).*

The issue of inclusion is a challenge, given that the pit emptying service is relatively new and the service provider has its own challenge of information dissemination.One of the key informants revealed that:

> *Further, not all the households have facilities that are emptiable; thus, this has a cost implication, although toilets built under the sanitation program do not have these challenges but most of them do. (Verbatim- KII LWSC).*

The study disclosed that most of the peri-urban areas are not accessible due to poorly constructed houses. This poor housing planning affects the service providers in providing emptying service when the toilets fill up. The key informant narrated that:

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> *Most of the peri-urban areas are not accessible due to poorly constructed houses in peri-urban areas, hence most of the pit emptiers fail to access the areas.* (Verbatim- KII LWSC).

4.1.2 Theme 1.1.2: Inadequate Water Supply

Water and sanitation are linked or are like a twin problem. For toilets to function properly, there is need for water supply, and moreover, some of the beneficiaries use pour-flush technologies which cannot function properly without water. One of the key informants interviewed revealed that:

> *Water and sanitation are directly linked. Where they use latrines, water is needed for cleaning and ensuring hygiene. Lack of water compromises sanitation. Some households use pour-flush toilets which cannot function without water. Most houses are forced to pay young boys to fetch water, creating an additional cost impacting their household income. Lack of water affects households' income, and children walk long distances to fetch water.* (Verbatim- KII LWSC).

4.1.3 Theme 1.1.3: Open Defecation

Open Defecation is a public health issue and is classified as a nuisance which leads to the spread of diseases. This normally happens when the faecal finds its way into the punctured system. One of the key informants interviewed narrated that:

> *Open defecation borders on public health and nuisance, and this leads to water-related diseases. The faecal matter may find its way into the water system due to leakages. Moreover, open defecation is an indicator that there are limited toilets in the peri-urban areas, hence people resort to open defecation.* (Verbatim- KII LWSC).

4.1.4 Theme 1.1.4: Bad Cultural Beliefs

Culture is embedded in sanitation and affects pit emptying services because women use pit latrines to dispose menstrual pads, hence when they fill up, the women tend to be uncomfortable to allow emptying of the toilets. One of the key informants revealed that:

> *The culture is what shapes sanitation and every other aspect of peri-urban life. If sanitation is not built to standards, it tends to affect menstrual hygiene because women dispose their menstrual towels in the pit latrines; hence, when a toilet fills up, pit emptying, for example, may pose some challenges because people would feel uncomfortable to have their sanitary pads emptied.* (Verbatim- KII LWSC).

The study revealed that most of the community beneficiaries reported facing significant challenges due to cultural reasons that made it difficult to consult married women without their spouses present. Consequently, when service providers engaged with beneficiaries, men often served as the primary point of contact at the household level. However, since men were frequently away from home, women were rarely consulted. A key informant elaborated:

> *"Women cannot be engaged alone without their spouses because of cultural norms deeply rooted in many societies."* Participant (GC 1).

4.1.5 Theme 1.1.5: Inadequate Sanitation Inclusion

Most key informants reported that challenges in engaging men and women during toilet or sanitation facility construction were largely due to poor timing. Men typically work during the week and are only available during holidays, which often causes them to miss consultative meetings. Meanwhile, women's multiple responsibilities in caring for their families and managing household tasks also hindered their attendance at sanitation meetings, resulting in their specific needs being overlooked in the construction process. One key informant noted:

> *"The challenges in engaging beneficiaries are primarily related to the timing of meetings, which is influenced by the methods used by project implementers. Men are usually out working during the week, so when meetings are held at that time, they are likely to miss them, leaving their needs and perspectives unaddressed. Similarly, women often use the mornings to shop for food, meaning that if meetings are scheduled during that time, they are likely to miss them as well, leading to their needs not being represented and resulting in them becoming passive users."* Participant (GC 16).

Due to the unequal division of labour in cleaning and managing toilets, many community beneficiaries reported that women bear the brunt of the responsibilities. Women are tasked with cleaning toilets and caring for their children, as household sanitation falls primarily on them, and they also contribute to the construction fees for sanitation facilities. One beneficiary shared:

> *"Women are the ones who suffer most. They are responsible for cleaning up after their children. After we collected the application forms from the service providers, my wife was the first to make the initial partial payment."* Participant (GC 19).

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The study revealed that the sanitation services and interventions follow the city-wide guidelines which include integration of culture, gender, disability and social inclusion. One of the key informants narrated that:

> *In my opinion, the services are inclusive because the interventions, before they are provided, need to follow the city-wide sanitation guidelines which entrench culture, gender, and social inclusion. It provides for inclusion of the aged, disabled, and the children.* (Verbatim- KII, NWASCO).

Inclusion in sanitation has been a challenge, given that most of the sanitation facilities were constructed with a blind eye with regards to social inclusion. However, toilets that were constructed by Lusaka sanitation program paid attention to inclusion of children through school clubs and inclusion of the old aged and people with disabilities by building toilets responsive to their needs. One of the key informants interviewed disclosed that:

> *The inclusion speaks to interventions by Lusaka sanitation program. Social inclusion has been a challenge because most facilities were designed with a blind eye to social inclusion aspects. The Lusaka sanitation program factored inclusion of children, disabilities, old aged, and the women. The children were included through sanitation clubs in school, hence helping them to understand sanitation matters early enough. Similarly, in terms of the disabled, the on-site sanitation gave families an option to pay for facilities which catered for disabilities such as lumps and rails. And similarly, the aged were catered for by constructing toilets with rails and lump.* (Verbatim- KII LWSC).

Participation in constructing sanitation facilities varied by area. In some places, women assisted by providing bricks and fetching water needed for construction, while in others, only men participated. A 37-year-old female community member with a grade 12 education noted:

> *"When building, women help with blocks and contribute from their business ventures for toilet construction. They also assist by fetching water for the construction."* Participant (GC 20).

Most male and female community beneficiaries noted that LWSC frequently invited them to meetings where they were educated about the sanitation project. Participants were involved in various roles, such as deciding the locations of toilets and doors, bricklaying, and supervising construction. Women tended to participate more actively during the construction process, as they also took care of children and ensured the toilets remained clean. Meanwhile, men's roles primarily involved raising funds for the construction and contributing money for locks, cleaning supplies, and other necessities. One female beneficiary shared:

> *"LWSC used to invite us to meetings where they explained the toilet construction project and what was needed. We helped supervise the construction and worked as bricklayers. Husbands attended the meetings but were less involved. They contributed funds for the toilets and for buying locks and toilet tissue."* Participant (GC 23).

Both men and women were expected to engage throughout the entire project cycle, including preparation, implementation, monitoring, evaluation, and maintenance. A key informant stated:

> *"Ideally, both men and women should be involved at every stage of the project cycle, including operation and maintenance. However, women's participation often appears as an ad hoc arrangement driven by donor requirements, rather than a natural inclusion that addresses their specific needs."* Participant (GC 24).

During the preparatory phase, both genders participated in community meetings and construction activities, though men were generally more involved in building. Women primarily handled the cleaning of toilets, while a few men occasionally helped with cleaning tasks, usually focusing on buying cleaning supplies. One of the male beneficiaries commented:

> *"Men and women attended community meetings to discuss toilet construction. While both contribute to cleaning, the majority of cleaning responsibilities fall to women because men are often not at home." Participant (GC 25).*

4.1.6 Theme 1.1.6: Lack of Standards

The state of sanitation in the peri-urban areas is not structured, hence it is haphazard, as there are no standards for constructing toilets. Moreover, the emptying services are not to the expected standards. One of the key informants revealed that:

> *The state of sanitation in the peri-urban areas is in a haphazard manner and there have not been standards to follow when constructing toilets. The emptying services are undesirable, and the pit latrines are not standard since they are constructed by the individual households.* (Verbatim- KII, LWSC).

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4.1.7 Theme 1.1.7: Population Growth Challenges

Moreover, another interview conducted with key informants disclosed that the population has been growing although the sanitation facilities have not been expanding. Because of this challenge, many people in the peri-urban areas depend on pit latrines and soakaways, given that the conventional system has not been expanding. One of the key informants revealed that:

> *The mandate to provide sanitation is with LWSC, but as you may be aware, in Lusaka, the situation is that the population has grown at a huge rate and sanitation still remains the same, so most of the facilities have depended on now using the soakaways and septic tanks; others are also using pit latrines, so in terms of enforcement, I can only talk about what we are doing with the Millennium projects in Mtendere where we are enforcing the law to ensure that every household located about 60 meters from the main sewer system connects to the system.* (Verbatim- KII, LCC).

4.1.8 Theme 1.1.8: Limited Inspectors to Enforce Sanitation Laws

Similarly, another key informant interviewed expressed that the main challenge faced by the regulators arises from the increase in population and limited presence of inspectors to help with enforcement of sanitation, particularly disposal in the open environment. One of the key informants interviewed revealed that:

> *From the regulatory point of view, the enforcement challenges faced are quite a number, and this includes population increase which has made it difficult for the regulator to have presence everywhere, hence posing compliance challenges on sanitation aspects to do with pollution to the environment.* (Verbatim- KII, ZEMA).

The key informant further revealed that:

> *The responsibility of the people in the communities is to ensure that they also help in prevention of the pollution of the environment by stopping the operators from discharging into the open environment, rather than leaving the responsibility to the regulator.* (Verbatim- KII, ZEMA).

4.1.9 Theme 1.1.9: Funding and Capacity Challenges

The enforcement of sanitation law faces funding challenges for logistics required to facilitate summons and transportation, among others. One of the key informants disclosed that:

> *Enforcement requires the local authorities, for example the council staff and public health inspectors. These need office space, vehicles, and other operational costs. Without resources, it's difficult to issue summons and make regular follow-ups to sanitation complaints; hence, limited funding does affect the sanitation by-law enforcement. (*Verbatim- KII, LWSC).

4.1.10 Theme 1.1.10: Limited Capacity and Vastness of the Peri-Urban Areas

Similarly, another key informant interviewed disclosed that the people in the peri-urban areas do not have capacity to put sanitation facilities; this is because of costs associated with construction of the sanitation facilities, despite education about the importance of sanitation. The other associated regulatory challenge is because of the vastness of the city, whereas Lusaka City Council is understaffed given the size of the city. One of the key informants disclosed that:

> *Most of the people do not have capacity to put up sanitation facilities because they are costly. Moreover, enforcement is a challenge because of limited staffing by the Lusaka City Council, which affects sanitation enforcement in the peri-urban areas.* (Verbatim- KII, LCC).

The key informant further revealed that most of the peri-urban areas started as unplanned settlements, hence this contributed to poor sanitation, and in some areas, water is limited, hence people use water from the shallow wells. (Verbatim- KII) LCC.

4.1.11 Theme 1.1.11: Poorly Constructed Pit Latrines and Operation Costs

The study established that before the construction of household sanitation facilities, community beneficiaries frequently suffered from diarrheal diseases and cholera outbreaks caused by unsanitary conditions. One of the community members shared:

> *"We often experienced cholera whenever the toilets filled up, and because of the poor sanitation and dirtiness of the toilets, it led to diarrheal outbreaks."* Participant (GC 13).

Further, the study revealed that most of the challenges faced in the peri-urban areas are poorly constructed pit latrines. The following is the extraction from one of the key informants:

> *Some of the challenges faced are poorly constructed pit latrines. Most of the pit latrines are in a terrible state. Most of the super structures are made of mud and often expose the households to diarrheal diseases. In areas where commercial utilities want to provide a service, we have*

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informal emptiers who are not regulated or provided with protection. Pit emptiers are not regulated, hence face uncontrolled pricing of the services. Moreover, the pit emptiers are not vaccinated and normally operate without personal protective clothing. Sometimes the pits tend to collapse on them as well as the users due to their poor state. Because of the poor state of the facilities, the service providers are forced to break the toilets when emptying, hence incurring a cost for cement to fix the broken part. Moreover, most of the customers do not see the reason why they should move to the new designs since they have been all along using the toilets and hence do not see the need to move to the new designs. Without demand, it is a challenge in terms of economic viability due to huge maintenance costs. (Verbatim- KII, NWASCO).

4.1.12 Theme 1.1.12: Shared Sanitation Facilities and Multiple Users

The shared toilets facilities in the peri-urban areas is not a strange thing due to multiple units of tenants, hence this compromises hygiene due to many users of the pit latrines. Moreover, most of the people fail to take responsibility when using pit latrines, particularly when it comes to cleaning. One of the key informants interviewed expressed that:

The shared facilities in the peri-urban areas are not strange due to multiple units. It is, therefore, inevitable for the households to share sanitation facilities, hence compromising on hygiene. Because of multiple users, when a toilet is messed, there are usually conflicts among users regarding taking or failure to take cleaning responsibilities. (Verbatim- KII LWSC).

Similarly to the issue of shared facilities is lack of privacy, hence people must wait before they can access the sanitation facility. One of the key informants interviewed disclosed that:

Similarly, privacy is another challenge faced by most of the people in the peri-urban areas, in which people must wait before they can access use of the sanitation facilities. (Verbatim- KII LWSC).

Most participants noted that before the construction of the toilets, they faced significant challenges due to multiple people sharing a single facility. This often led to long waits, and women sometimes had to ask neighbours to use their toilets, which could result in insults. As one male beneficiary explained:

"We struggled with waiting for others to finish since there was only one toilet. Women would ask neighbours, and sometimes they were told to just have their landlords build toilets." Participant (GC 25).

4.1.13 Theme 1.1.13: Inequality and Urinary Tract Infections

Many female beneficiaries pointed out that sanitation challenges disproportionately affected them, especially regarding water scarcity, which increased their risk of urinary tract infections. The high number of users also heightened health risks. Additionally, the lack of water became especially problematic during menstruation, making women hesitant to use the toilets for fear of embarrassment if they stained them. One of the community members said:

"The lack of water in the toilets is particularly challenging during menstruation. Women tend to avoid using them when many people share the space because they feel ashamed if others see a mess." Participant (GC 21).

4.1.14 Theme 1.1.14: Sexual Violence Risks

The study revealed that women also voiced concerns about the safety risks associated with sharing toilets, which posed threats to girls and women, including the risk of defilement and rape. A key informant noted:

"Sharing toilets presents significant risks for women; there have been instances of girls being defiled and women being raped." Participant (GC 24).

4.1.15 Theme 1.1.15: Multiple Licensing and Jurisdiction

The study revealed that most of the people in the peri-urban areas face the challenges that service providers are licensed to operate in each area of jurisdiction. However, due to limited demand, they are sometimes forced to move to other areas where they are also expected to get a new license for that area and probably sign a contract; hence, this raises the cost of doing business. One of the key informants expressed that:

*The other challenge observed is that the operators are usually licensed according to the operating areas of jurisdiction in which they operate based on the license obtained for that area, but when demand declines, they are forced to move to other areas in which they are forced to obtain another license and sign a new contract. (*Verbatim- KII, NWASCO).

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4.1.16 Theme 1.1.16: Limited Data on On-site Sanitation

The study revealed that there are limited studies that have been conducted on on-site sanitation. The key informant expressed that:

> *Limited data on on-site sanitation because most of the existing information is aligned to the sewerage facilities, hence there is need to carry out studies on the on-site sanitation to address this gap. Currently the regulator is conducting GIS mapping to address the nuances of the on-site sanitation.* (Verbatim- KII, NWASCO).

The key informants further noted that it is a challenge for most of the people to put up the sewer system because it is far, and the cost is huge. The council also lacks capacity in terms of human resource to cater for the whole city. The key informant revealed that:

> *Yes, so in terms of sanitation challenges, most people, in as much as we educate, might not have the capacity to be able to put up sanitary facilities. In other areas, the network is very far, and the costs other people cannot manage to pay. And in terms of human resources, the council does not have enough human resources to cater for the entire city at the same time, so those could be some of the challenges.* (Verbatim- KII, LCC).

4.1.17 Theme 1.1.17: Limited Stakeholders Participation

Sanitation adherence requires community participation, and this can only be attained if there is community awareness through education on their responsibilities of ensuring compliance to the sanitation laws. One of the key informants interviewed revealed that:

> *Communities are the key stakeholders in sanitation, hence their participation helps in ensuring adherence, and this can only be achieved if the communities are educated for them to see the reasons why they need to adhere to the sanitation laws put in place by the government.* (Verbatim- KII, ZEMA).

The stakeholders are there, but most of them tend to work in silos. Moreover, stakeholders are not involved in enforcement. One of the key informants revealed that:

I think we have a lot of stakeholders, but they like to work in silos. In terms of enforcement, they don't play a role. (Verbatim- KII, ZEMA).

4.1.18 Theme 1.1.18: Limited Funding

One of the challenges affecting implementation of sanitation laws is limited funding and logistical support. The following is an extraction from one of the key informants:

> *As I said, we need vehicles to be mobile and to ensure sanitation in the peri-urban areas, which is a challenge.* (Verbatim- KII, LCC).

The cost of constructing household sanitation facilities was a significant burden for both men and women beneficiaries, as noted by a key informant:

> *"We face financial challenges which affect both men and women. The cost of sanitation is high, and we were assisted to finish the part payment by our grandson."* Participant (GC 11).

4.1.19 Theme 1.1.19: Environmental Challenges

Many male and female-headed households faced significant challenges with toilet emptying, largely due to overcrowding and the absence of clear road networks in the area. This made it difficult for vacuum tankers and sanitation service providers to access the facilities. Additionally, most yards were dug out for toilets, leading to contamination of the entire area, as users often had to dig new holes once the original toilet was full. A key informant noted:

> *"It's a challenge to access their facilities due to poor housing planning. When toilets are full, it becomes difficult to facilitate emptying because of the lack of access. They often must decommission a toilet and dig in other places, which creates unhygienic conditions as people resort to using plastics."* Participant (GC 11).

During the construction of the toilets, beneficiaries also faced challenges in waterlogged areas, where toilets could fill up before construction was completed. One of the key informants revealed that:

> *"In some instances, certain areas were waterlogged, and toilets were filling up before the construction was finalized."* Participant (GC 11).

4.1.20 Theme 1.1.20: Weak Community Structures

The study established that there are no dedicated structures to deal with sanitation, given that the D-WASH are not well coordinated at community level, and they are usually not integrated in the sanitation programmes. One of the key informants revealed that:

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There are challenges in terms of structure that are dedicated to sanitation. We have D-WASH structures at community level, but these are not well coordinated, and they are usually not involved in sanitation programmes. (Verbatim- KII, LCC).

4.1.21 Theme 1.1.21: Limited Focus on On-Site Sanitation

Similarly, the study disclosed that on-site sanitation is relatively new compared to sewerage systems. The following is an extraction from one of the key informants:

> *The main institutional challenge is that on-site sanitation is a relatively new space in water and sanitation utilities have moved into. The company used to previously focus more on the sewerage systems. There is need to change mindset and institutional capacity, which often comes with financial constraints. Institutional coordination is not a challenge since the utility companies are a creation of the local authorities. Also, the NGO WASH Forum has helped in institutional coordination.* (Verbatim- KII, NWASCO).

4.1.22 Theme 1.1.22: Resistance and Acceptability Challenges

The study revealed that on-site sanitation is a relatively new technology and that most of the people are resistant to change, hence creating low acceptability of the facilities in the peri-urban areas. One of the key informants disclosed that:

> *There was resistance to acceptance of the on-site sanitation because it is a relatively new technology, hence many people in the peri-urban areas are still resisting to move to this new technology.* (Verbatim- KII, LWSC 2).

4.1.23 Theme 1.1.23: Lack of Prioritisation of Sanitation Services

The study noted that when given a choice to make in the peri-urban areas, people would choose water supply and other services rather than toilets. This has made it a challenge to improve the sanitation situation in the peri-urban areas. One of the extractions from the key informant disclosed that:

> *The people in the peri-urban areas would rather choose water services and other facilities as opposed to pit latrines.* (Verbatim- KII, LWSC 2).

4.1.24 Theme 1.1.24: Poor Ground and Rock Conditions

The study found that sanitation investments have been a challenge in most of the peri-urban areas because of the ground conditions, which are usually waterlogged as well as rocky. This makes it very difficult to construct a pit latrine. The service provider instead is forced to have above-the-ground toilets as opposed to the traditional pit latrines. One of the key informants revealed that:

> *The toilets constructed are shallow because of the raised water table, which was affecting most of the toilet constructions in the peri-urban areas. Some of the areas were rocky, hence making it difficult to dig deeper pit latrines.* (Verbatim- KII, LWSC 2).

4.1.25 Theme 1.1.25: Alteration of the Toilet Designs

The study established that Lusaka Water Supply and Sanitation Company constructed the toilets with certain design features such as showering devices and emptying provision. But the people are not comfortable with these designs, hence they resorted to the old designs, which according to them helps the toilets to fill up quickly, given the multiple users at some of the households. One of the key informants expressed that:

> *The toilets which were constructed by the Lusaka Water Supply Company had a certain design which made it easier for emptying. However, due to multiple users of the toilets, people are not comfortable to maintain the service providers' designs, hence they resorted to changing them to suit their needs. Some of the toilets came with shower facilities, which they removed, hence water goes directly into the latrine, causing the facilities to quickly fill up.* (Verbatim- KII, LWSC 2).

4.1.26 Theme 1.1.26: Scheduled Desludging Model and Design Alteration

Moreover, due to design alterations, it is now becoming difficult to implement the company's initiative or policy direction to implement the scheduled desludging, especially in most of the toilets, particularly those which were constructed with the support from the utility. One of the informants revealed that:

> *Most of the toilets were tampered with in terms of initial designs, which had provision for pit emptying as well as management of grey water from the shower rooms. But this was removed, so water goes directly into the pit latrines, hence making them fill up quickly.* (Verbatim- KII, LWSC 3).

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4.1.27 Theme 1.1.27: Disease Outbreaks and Poor Sanitation

The study established that before the construction of household sanitation facilities, community beneficiaries frequently suffered from diarrheal diseases and cholera outbreaks caused by unsanitary conditions. One of the community members shared:

> *"We often experienced cholera whenever the toilets filled up, and because of the poor sanitation and dirtiness of the toilets, it led to diarrheal outbreaks."* Participant (GC 13).

The study revealed that challenges faced in the peri-urban areas are the poorly constructed pit latrines. The following is the extraction from one of the key informants:

> *Some of the challenges faced are poorly constructed pit latrines. Most of the pit latrines are in a terrible state. Most of the superstructures are made of mud and often expose the households into diarrhoea diseases.* (Verbatim- KII, NWASCO).

4.1.28 Theme 1.1.28: High Emptying Cost and Unregulated Pit Emptying

The study found that the communities face the challenge of high cost in accessing sanitation services from the service providers who are not regulated. The unregulated service providers fail to adhere to the standard operating procedures, hence face occupational risks while providing pit emptying services. One of the key informants expressed that:

> *In areas where commercial utilities want to provide a service, we have informal emptiers who are not regulated or provided with protection. Pit emptiers are not regulated, hence face uncontrolled pricing of the services. Moreover, the pit emptiers are not vaccinated and normally operate without personal protective clothing. Sometimes the pits tend to collapse on them as well as the users due to their poor state because of the poor state of the facilities— the service providers are forced to break the toilets when emptying, hence incurring a cost for cement to fix the broken parts.* (Verbatim- KII, NWASCO).

4.1.29 Theme 1.1.29: Lack of Motivation to Embrace Sanitation Technological Changes

The study established that most of the communities are not motivated to embrace the new sanitation technologies because they are used to the traditional pit latrines. The following is an extraction from one of the key informants:

> *Moreover, most of the customers do not see the reason they should move to the modern designs since they have been all along using the toilets, hence do not see the need to move to the modern designs. Without demand, it is a challenge in terms of economic viability due to huge maintenance costs.* (Verbatim- KII, NWASCO).

4.1.30 Theme 1.1.30: Multiple Toilet Users and Prolonged Access Time

Similarly, one of the community beneficiaries narrated that, most participants noted that before the construction of the toilets, they faced significant challenges due to multiple people sharing a single facility. This often led to long waits, and women sometimes had to ask neighbours to use their toilets, which could result in insults. As one male beneficiary explained:

> *"We struggled with waiting for others to finish since there was only one toilet. Women would ask neighbours, and sometimes they were told to just have their landlords build toilets."* Participant (GC 25).

4.1.31 Theme 1.1.31: Disproportional Gendered Impacts

The study revealed that most of the female beneficiaries pointed out that sanitation challenges disproportionately affected them, especially regarding water scarcity, which increased their risk of urinary tract infections. The high number of users also heightened health risks. Additionally, the lack of water became especially problematic during menstruation, making women hesitant to use the toilets for fear of embarrassment if they stained them. One of the community members expressed that:

> *"The lack of water in the toilets is particularly challenging during menstruation. Women tend to avoid using them when many people share the space because they feel ashamed if others see a mess."* Participant (GC 21).

4.1.32 Theme 1.1.32: Safety Risks and Girls' Sexual Assault

The study revealed that women face the safety risks associated with sharing toilets, which posed threats to girls and women, including the risk of defilement and rape. A key informant noted:

> *"Sharing toilets presents significant risks for women; there have been instances of girls being defiled and women being raped."* Participant (GC 24).

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5.2 Discussion

5.2.1 Access to Sanitation

The main challenge in sanitation continues to be limited access to appropriate sanitation facilities, coupled with inadequate emptying services. In many cases, communities also lack sufficient information and awareness regarding the sanitation products and technologies available to them. Existing literature indicates that the regulatory focus in many countries has historically leaned towards off-site sanitation systems. For instance, although the Water Supply and Sanitation Act recognizes sanitation services to include both off-site sewered systems and on-site sanitation, regulatory activities over the past decade have concentrated on sewerage services. Energy and Water Utilities Regulatory Authority (EWURA, 2020) highlights that while approximately 90 percent of households in the service areas rely on on-site sanitation systems, faecal sludge management from these facilities remains poorly regulated. Most of the existing pit latrines and on-site systems do not meet the required non-sewered sanitation standards, resulting in risks of environmental contamination and adverse public health outcomes. Additionally, the sanitation service chain—from containment and emptying to transportation, treatment, and final disposal or reuse—remains weak and fragmented, meaning that no segment is currently being managed safely. This situation underscores the need for improved regulatory oversight, investment in faecal sludge management infrastructure, and enhanced community sensitization to ensure effective and sustainable sanitation service delivery.

5.2.2 Limited Water Supply

The study revealed that limited water supply remains a major constraint to effective sanitation service delivery in peri-urban areas. Participants repeatedly emphasized that "water and sanitation are like a twin problem," as the functionality of household toilets—especially pour-flush technologies—depends heavily on consistent access to water. Where water supply is unreliable, irregular, or entirely absent, households face significant challenges in maintaining hygiene practices, flushing toilets, and preventing blockages or odour build-up. As a result, sanitation facilities may fall into disuse or be used in unsafe ways, undermining public health outcomes. This finding is consistent with the literature, which establishes that water scarcity directly affects sanitation behaviour and facility sustainability. According to McConville et al. (2017), pour-flush systems require adequate and reliable water to operate effectively, and in low-income or peri-urban settings where water supply is intermittent, households may revert to unhygienic alternatives, including open defecation or the use of shallow and unsafe pits. Similarly, the World Health Organisation (2021) stresses that water insecurity increases the risk of faecal contamination pathways, especially where households must ration water between drinking, bathing, laundry, and sanitation.

The study further suggests that limited water supply disproportionately affects women and girls, who are primarily responsible for water collection and household sanitation upkeep. Where water is scarce, the burden of securing water for toilet use increases, adding to women's labor and exposing them to health and safety risks. Therefore, addressing sanitation challenges in peri-urban areas requires not only improving toilet infrastructure but also strengthening water supply systems. Integrated planning that treats water and sanitation as interdependent services—rather than separate sectors—is essential for ensuring the long-term sustainability of sanitation improvements.

5.2.3 Open Defecation

The study revealed that open defecation continues to be a public health concern in peri-urban areas. Participants indicated that when faecal matter is not properly contained, it often finds its way into the environment or nearby drainage systems, creating unhygienic conditions that facilitate the spread of communicable diseases. Open defecation is not only a health risk but also classified as a public nuisance, as it contaminates water sources, attracts vectors such as flies, and undermines community well-being and dignity. This finding aligns with global sanitation literature. Mara (2017) observed that exposure to human excreta in the environment significantly increases the risk of diarrheal diseases, cholera, typhoid, and parasitic infections. Similarly, Cairncross (2003) emphasizes that inadequate containment of faecal matter in low-income settings is a leading contributor to environmental contamination and persistent public health challenges. Moreover, open defecation often occurs where households lack access to safe, affordable, and conveniently located toilets or where cultural and behavioural factors discourage consistent use of available facilities. The study suggests that even when toilets are present, challenges such as overcrowding, water scarcity, and poor facility maintenance can drive residents to practice open defecation as a coping mechanism (Cairncross, 2003). Addressing open defecation requires a multifaceted approach that combines infrastructure development, behaviour change communication, community engagement, and enforcement of sanitation regulations. Ensuring that all households have access to usable, safe, and inclusive toilets is critical for reducing environmental contamination and improving public health outcomes in peri-urban communities (Ibid, 2003).

5.2.4 Culture and Sanitation

The study revealed that cultural practices significantly influence sanitation behaviours and impact the management of pit latrines. Participants indicated that women often use pit latrines to dispose of menstrual pads and

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other personal hygiene products. When pits fill up, these cultural practices can create discomfort or embarrassment, making women hesitant to allow pit emptying. This affects the efficiency of faecal sludge management services and may delay timely emptying, further increasing health risks and environmental contamination. This finding is consistent with literature that highlights the intersection of culture, gender, and sanitation behaviour. Sommer et al. (2015) posit that cultural norms surrounding menstruation and privacy influence women's willingness to use and maintain sanitation facilities. Similarly, Caruso et al. (2017) note that cultural taboos around menstrual hygiene can prevent women from fully engaging with sanitation services, creating barriers for both safe facility usage and effective sludge management. Cultural practices thus need to be integrated into sanitation planning to ensure that interventions are socially acceptable and responsive to community needs. Sensitization campaigns, gender-responsive designs, and community engagement can help address cultural concerns while promoting safe emptying practices. Incorporating these considerations ensures that sanitation services are not only technically functional but also socially sustainable, respectful, and inclusive (Caruso et al., 2017).

5.2.5 Population Growth

The study revealed that rapid population growth in peri-urban areas has outpaced the expansion of sanitation infrastructure. Key informants indicated that while the population continues to increase, sewerage systems and other centralized sanitation facilities have not expanded accordingly. As a result, many households rely on pit latrines and soakaways as their primary sanitation option, not out of preference but due to the limited availability of conventional sewer systems. This reliance places considerable pressure on existing onsite sanitation systems, leading to challenges with pit emptying, site selection for new toilets, and environmental contamination. This finding is consistent with Mara (2017), who emphasizes that inadequate infrastructure in rapidly growing peri-urban settlements increases the risk of groundwater contamination and the spread of faecal-oral diseases due to overuse of onsite facilities. The implications of this finding highlight the urgent need for integrated urban planning and sanitation strategies. Expanding access to lined, emptiable latrines, investing in decentralized treatment options, and planning for population growth are essential to reducing health risks and improving environmental sanitation. Addressing population pressures is thus not only a technical challenge but also a governance and policy issue that requires coordinated action between local authorities, utility providers, and communities.

5.2.6 Poorly Constructed Pit Latrines and Operation Costs

The study revealed that prior to the construction of improved household sanitation facilities, community members in peri-urban areas frequently experienced diarrheal diseases and cholera outbreaks due to unsanitary conditions. Poorly constructed pit latrines not only failed to contain faecal matter safely but also posed operational challenges for households and service providers. When pits fill up, households often struggle to finance emptying or reconstruction, and the absence of lined or durable facilities increases maintenance costs and environmental contamination risks. This finding is consistent with Strauss (2002), who notes that unlined or substandard pit latrines in informal settlements frequently overflow or collapse, making safe sludge management difficult and expensive. Similarly, Tomoi et al. (2025) observed that households disposing of solid waste into pits exacerbate filling rates and increase emptying costs, creating additional barriers to sanitation access. High operational costs and frequent facility failures often discourage timely emptying and may result in unsafe disposal practices, such as dumping sludge into drains or open spaces. The study underscores the importance of promoting durable, lined, and emptiable pit latrines that are financially accessible to households. Investing in improved construction not only enhances public health outcomes by reducing disease transmission but also lowers long-term operational costs, improves the efficiency of faecal sludge management services, and supports the sustainability of sanitation interventions in peri-urban communities.

5.2.7 Exposure to Faecal Matter and Lack of Vaccinations

The study revealed that residents in peri-urban areas face significant risks of exposure to faecal matter, compounded by limited access to essential vaccinations. This exposure creates heightened vulnerability to water- and sanitation-related diseases, such as cholera, typhoid, and diarrheal infections. Manual pit emptiers are particularly at risk due to the nature of their work, often managing faecal sludge without personal protective equipment (PPE) or adequate training. These occupational hazards are exacerbated by poor health monitoring and limited collaboration among stakeholders responsible for worker safety, health services, and sanitation oversight. This finding aligns with Chumo (2021), who observed that informal pit emptiers in most peri-urban settlements operate under unsafe conditions, lacking protective gear and access to occupational health services. The combination of faecal exposure and insufficient vaccination coverage increases both individual health risks and broader public health threats in densely populated areas. Addressing these challenges requires strengthening vaccination coverage for communities and sanitation workers, ensuring provision of PPE and training for pit emptiers, and promoting coordinated efforts among health, labour, and sanitation authorities to protect worker health and mitigate environmental contamination. Implementing these measures

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would reduce the risk of disease transmission, improve occupational safety, and enhance the overall effectiveness and sustainability of sanitation interventions in peri-urban areas.

5.2.8 Poor Ground and Rock Conditions

The study revealed that sanitation investments in most peri-urban areas are significantly constrained by the physical environment, particularly the presence of waterlogged and rocky ground conditions. These geological limitations make it difficult to construct conventional pit latrines. As a result, service providers are often compelled to adopt above-ground toilet designs instead of the traditional pit-based systems commonly used in other settings. This finding reflects practical challenges that are not merely technical but structural, as the environmental context directly shapes the type of sanitation solutions that can be sustainably implemented.

Moreover, the existing literature also acknowledges that hydro-geological conditions are a critical determinant of sanitation system feasibility. Kennedy-Walker et al. (2015) argue that high water tables and rocky terrains complicate underground containment systems, increasing risks of groundwater contamination and structural failure. Similarly, studies from other Sub-Saharan African cities have reported that poor soil conditions require flexible sanitation innovations rather than uniform technology transfer (Mara, 2017). Thus, the challenge identified in this study is consistent with wider regional experiences.

The researcher observed that this study departs from existing knowledge by documenting how these environmental constraints directly influence decision-making at community and utility levels, and how these constraints shape user perceptions of new sanitation systems. While the literature typically highlights technical limitations, the present study provides insight into the social response: some community beneficiaries expressed dissatisfaction with above-ground toilet models, viewing them as temporary or less durable. This highlights an important socio-cultural dimension that is often overlooked. The study demonstrates that acceptability of sanitation technologies is not only a function of functionality but also of perception and cultural familiarity. The environmental challenges do not just call for engineering adaptations but require strengthened sensitisation, participatory design, and ongoing user engagement to build trust and sustain use of alternative sanitation models in peri-urban contexts.

5.2.9 Lack of Sanitation Standards

The state of sanitation in peri-urban areas is not structured; hence, its haphazard nature exists as there are no standards for constructing toilets. Moreover, the emptying services are not to the expected standards. Similarly, a study conducted in Tanzania disclosed that the main challenges of sanitation include low standard toilets which are not emptiable (non-emptiable toilets), leaking containments, unsafe emptying and transportation practices and facilities, inadequate faecal sludge treatment facilities, and unsafe disposal practices. In addition, in each segment of the non-sewered sanitation service chain, the institutional and regulatory monitoring and enforcement of quality of service are ineffective (EWURA, 2020).

5.2.10 Resistance and Acceptability Challenges

The study revealed that one of the core challenges in the implementation of on-site sanitation in peri-urban areas is the resistance to change among community members. On-site sanitation is perceived as a relatively new technology, and most households have historically relied on traditional pit latrines or shared sanitation facilities. As such, some beneficiaries have been slow to adopt the new models, creating low levels of acceptability of the facilities introduced through sanitation programmes. Further, reviewed literature also acknowledges that the success of sanitation interventions is shaped not only by technical feasibility but also by sociocultural acceptance. Jenkins et al. (2015b) argue that sanitation choices are deeply embedded in cultural practices, familiarity, and perceptions of convenience. Water Aid (2013) notes that low acceptability is not simply a matter of cultural resistance or lack of awareness. Instead, the resistance observed in George Compound is closely linked to practical experiences with the new facilities, including shallow pit designs, perceived fragility of the structures, and the financial burden associated with maintenance and desludging. In this context, resistance is partly a response to past frustrations and perceived risks, rather than a mere hesitation towards change. Therefore, it is established that acceptability is directly influenced by how beneficiaries experience the performance, durability, and economic implications of sanitation innovations. It underscores that adoption is not only a behavioural issue, but also a matter of trust in the sustainability and suitability of the technology within the lived reality of the community. This insight reinforces the need for participatory design, user-informed construction standards, and continuous sensitisation that connects the household's daily experiences with broader public health goals.

5.2.11 Solid Waste, Lighting, and Sludge Texture

The study revealed that the rapid filling of sanitation facilities was worsened by the practice of using the toilets as solid waste disposal pits. This resulted in a heavier and more compact sludge texture that made desludging difficult, and in some cases, impossible for the service provider. Additionally, the usability of sanitation facilities at night was

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constrained by inadequate lighting, a situation aggravated by frequent load shedding. The absence of lighting discouraged proper toilet use during night hours, thereby contributing to unsafe sanitation practices within the community. The implication of this finding is that sanitation interventions must address both behavioural practices and environmental support systems. It is not sufficient to construct toilets without accompanying behavioural change communication and waste management education. The issue of lighting further demonstrates that sanitation outcomes are also linked to energy availability and household infrastructure. Therefore, achieving sustainable sanitation goes beyond facility provision to include integrated community awareness strategies, solid waste management solutions, and supporting services such as safe lighting.

The Systems Theory in this study is demonstrated in how sanitation is affected by multiple, interlinked institutional and community actors. Lusaka City Council, which holds the regulatory mandate for enforcing sanitation bylaws, plays a central role in ensuring that households construct appropriate and emptiable sanitation facilities. However, the Council's enforcement efforts depend on other actors within the sanitation ecosystem. For instance, Community-Based Enterprises (CBEs) and private waste collectors are responsible for routine solid waste collection, which helps reduce the incentive for households to dispose of solid waste into toilets. Where waste collection services are irregular or unaffordable, households resort to disposing waste in pit latrines, which directly affects the functional lifespan and desludging capacity of sanitation facilities.

Furthermore, schools within the community act as important social learning spaces where sanitation norms and hygiene behaviours can be reinforced among children, who then influence practices at household level. Lusaka Water Supply and Sanitation Company, while responsible for desludging and sludge treatment, cannot effectively execute its mandate if households fail to adhere to construction standards or if waste management fails at the community level. Therefore, sanitation service delivery is not the responsibility of a single institution but rather an interconnected system involving households, schools, regulators, and waste management entities. This systems-based interaction shows that breakdown in one subsystem—such as ineffective solid waste collection or lack of enforcement—directly weakens the functioning of another subsystem, such as desludging services. Sustainable sanitation requires continuous coordination, communication, and mutual reinforcement across all actors in the sanitation value chain.

The study findings are novel, premised on its unrelated household practices, such as solid waste disposal and lighting access, which have direct operational implications on the functionality of improved on-site sanitation systems. While literature acknowledges that infrastructure challenges and behaviour influence sanitation uptake, this study provides a contextualized insight into how the sludge composition itself becomes altered due to waste disposal behaviours, thereby complicating desludging operations. Additionally, the study introduces lighting as a sanitation access variable, a dimension rarely highlighted in peri-urban sanitation research. The finding therefore provides new empirical evidence on the multi-layered, system-dependent nature of sanitation sustainability in George Compound.

5.2.12 Environmental and Design Challenges

The study highlighted that many of the newly constructed toilets have shallow pits, which has resulted in rapid filling and frequent need for emptying. This situation places a disproportionate burden on women, who are traditionally responsible for managing household sanitation. The shallow design was attributed to environmental challenges such as high-water tables and rocky ground conditions, which restrict the depth at which pits can be safely constructed. However, while these environmental constraints were known, the community feedback indicates that the design did not fully consider the long-term usability of the facilities. As a result, the sanitation infrastructure, although improved in form, has introduced new maintenance pressures on households.

The implication of this finding is that technological and infrastructure innovations in sanitation must be informed by both environmental assessments and everyday user experiences. Design solutions that overlook the realities of household management risk reinforcing existing gender inequalities, as women bear the responsibility of repeatedly negotiating desludging services. There is therefore a need for more consultative and participatory approaches where community voices—particularly those of women—are included during the planning and design processes.

The systems theory lens helps to show that sanitation infrastructure design is not an isolated element but part of a broader, interconnected system involving households, regulatory institutions, service providers, and environmental conditions. Lusaka Water Supply and Sanitation Company constructs sanitation facilities and manages desludging services, but its effectiveness is contingent on the designs supported by the Lusaka City Council during building plan approval, the enforcement role of the Public Health Department, and the ground conditions identified by environmental assessments. When these subsystems are not aligned—for example, when construction standards do not account for environmental constraints or when women's lived realities are excluded from planning—the sanitation system becomes disjointed, resulting in inefficiencies and unintended burdens. This finding demonstrates that improving sanitation in peri-urban areas is not simply a matter of providing infrastructure; it requires coordinated planning across institutions, technical experts, and community stakeholders to ensure that the sanitation system functions as an integrated whole.

The novelty of this finding lies in showing how design limitations in sanitation infrastructure translate into gendered labour burdens in contexts where environmental constraints restrict construction options. While existing

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literature acknowledges environmental challenges and gender roles in sanitation, limited empirical evidence has demonstrated how shallow pit designs directly intensify women's routine workloads by increasing the frequency of desludging activities. This study therefore contributes new insights by illustrating the socio-technical implications of sanitation design decisions and highlighting the need for gender-responsive and environmentally sensitive sanitation planning in George Compound and similar peri-urban settings.

5.2.13 Weak Community Structures

The study found that community-level sanitation coordination structures, particularly the District Water, Sanitation and Hygiene (D-WASH) committees, were either weak or not actively integrated into ongoing sanitation programmes. As a result, there were no dedicated or functional mechanisms within the community to support sanitation awareness, monitoring, or collective action. This gap in local institutional capacity limited the effectiveness and sustainability of sanitation interventions.

These findings are consistent with observations by Tidwell et al. (2018), who note that community-level WASH committees often fail to function effectively when they lack clear roles, resources, or supportive policy frameworks. Similarly, Water Aid (2013) argues that the absence of strong community governance structures undermines sanitation uptake and behaviour change, especially in informal and peri-urban settings where service delivery already faces structural challenges.

In this context, the weak coordination of D-WASH committees means that essential activities—such as hygiene promotion, toilet maintenance planning, community sensitization, and monitoring of sanitation practices—are not systematically implemented. Without a stable platform for community dialogue and accountability, sanitation becomes an individual household responsibility rather than a shared community concern. This situation contributes to fragmented responses to sanitation challenges and reduces the likelihood of long-term sustainability, as households may not prioritize maintenance or collective hygiene norms. The findings also highlight the significance of community involvement in sanitation interventions. As argued by Harvey and Reed (2007), successful sanitation programmes require local ownership, where communities actively participate in planning, decision-making, and oversight. The lack of such participation in the study area suggests that external interventions may have been implemented in a top-down manner, without adequate empowerment or capacity building at the community level.

Strengthening D-WASH committees and embedding them more effectively into local governance and sanitation programmes could therefore play a critical role in improving service delivery and ensuring that sanitation systems are used, maintained, and sustained. This may require community training, resource support, regular monitoring, and clearer coordination between local authorities and community structures (Harvey & Reed, 2007).

5.2.14 Funding and Capacity Challenges

The study further revealed that the enforcement of sanitation laws is significantly constrained by limited financial and logistical capacity. Participants noted that regulatory bodies and local authorities face persistent challenges in securing adequate resources to support routine monitoring, community sensitization, issuance of summons, and transportation for field activities. Without sufficient funding, enforcement officers are often unable to conduct inspections consistently or respond promptly to sanitation violations, which weakens the overall regulatory framework. This finding aligns with Mensah et al. (2022), who argue that even when sanitation laws are well-articulated, their effectiveness is undermined when enforcement agencies lack operational resources, staffing, vehicles, and administrative support. The funding limitations also affect community outreach and awareness-raising efforts, which are essential for achieving behavioural change. When enforcement institutions cannot complement punitive measures with public education, compliance becomes more difficult to achieve. As a result, sanitation challenges become self-reinforcing: poor compliance leads to environmental and health risks, which require greater institutional intervention, yet the institutions lack the resources to provide it. Therefore, strengthening the enforcement of sanitation laws requires not only policy commitment but also sustainable financing mechanisms to support day-to-day operations. This could include increased budget allocations to local authorities, integration of private sector cost-sharing models, or community-based enforcement structures supported by local by-laws.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study was guided by an objective which explored stakeholders' perceived sanitation challenges faced by the community in the peri-urban areas of Lusaka. The study adopted an interpretive phenomenology, which guided the generation of knowledge through interpretive principles such as reflexivity of data to help create meaning, thus anchoring the study on a subjective epistemology. The study leaned heavily on interpretive phenomenology because it sought to gather stakeholders' lived experiences.

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In view of the study objectives, the study revealed several critical insights, including the following:

The study disclosed that, due to limited demand for pit-emptying services, service providers are sometimes forced to move to other areas to search for more business opportunities. In these new areas, the service providers are also expected to obtain new licenses to operate and probably sign a contract to enable them to do business, thus raising the cost of operations. Moreover, the study revealed that there are no dedicated structures to deal with sanitation, given that community structures such as the D-WASH are not well coordinated at the community level and are usually not integrated into the sanitation programmes.

The study is significant as it contributes to the global agenda on Sustainable Development Goal number 6, and also cascades to the national water and sanitation policy regarding sanitation provision. This, therefore, demands that the government of Zambia should seriously consider having a single licensing regime to optimize demand for sanitation emptying services, as well as attract more players in the provision of sanitation services.

5.2 Recommendations

5.2.1 The Government

The Government needs to realign the licensing regime for on-site sanitation. Currently, there are multiple permits and licenses required by on-site sanitation service providers. The service is relatively new, hence there is limited demand, which forces sanitation players to move into other areas where they are made to obtain a new license. This thus complicates the cost of business operations. There is also need for Government to ensure that the sanitation players are coordinated to avert fragmentations and duplication of mandates in some of the roles. Furthermore, there is need for the government to recognize the bottom-up regulatory enforcement of the on-site sanitation.

5.2.2 The Water and Sanitation Utility Companies:

The water and sanitation utility companies should integrate toilet construction with complementary services, including reliable water supply and lighting, recognizing that inadequate lighting affects night-time safety and usage. The water and sanitation utility company should construct pit latrines that integrate solar-powered lighting and pumping systems, ensuring uninterrupted sanitation service at night due to loadshedding. The water and sanitation utility companies should also adopt a co-design approach that involves residents and artisans at each stage of toilet design and siting to prevent pit depth problems and shallow lining failures. Furthermore, the water and sanitation utility companies should intensify community sensitization programs on preventing vandalism, misuse, and unauthorized design changes, which were highlighted as major implementation setbacks in the study.

5.2.3 Community Stakeholders

Community stakeholders should be sensitized against vandalism of the sanitation infrastructure in peri-urban areas. There is also need for community stakeholders to coordinate with service providers and regulators to ensure community participation in the sanitation services.

5.3 Ethical Consideration

The researcher conducted this study by ensuring protection of human rights through the following guiding principles, principles of dignity, integrity, right to self-determination, privacy, anonymity, beneficence and confidentiality. (Yip et al., 2016). The researcher navigated ethical issues by obtaining consent from the University of Zambia (UNZA), School of Humanities & Social Science research ethics committee under the Directorate of Research and Post Graduate Studies (DGRS). Furthermore, the researcher obtained consent from the institutions and the Community participants who consented to participate in a study voluntarily and without coercion. Moreover, the researcher provided information sheet to the participants in to furnish them with more information on the procedures to participate in the research study as well as to withdraw thus highlighting potential risks.

REFERENCES

Agenda 2063: The Africa we want. (2015). African Union Commission.

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, 2, 100051. https://doi.org/10.1016/j.glmedi.2024.100051

Akhter, S. (2022). Key informants' interviews. In M. R. Islam, N. A. Khan, & R. Baikady (Eds.), *Principles of Social Research Methodology* (pp. 389–403). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-5441-2_27

Arias-Gómez, J., Villasís-Keever, M. Á., & Miranda-Novales, M. G. (2016). El de investigación III: la población de estudio. *Revista Alergia México*, 63, 201–206. https://doi.org/10.29262/ram.v63i2.181

Beehner, (2025). Systems theory. In *The Palgrave Encyclopedia of Leadership and Organizational Change*. Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-51650-4

Licensed Under Creative Commons Attribution (CC BY-NC)

Brown, J., Albert, J., & Whittington, D. (2019). Community-led total sanitation moves the needle on ending open defecation in Zambia. *The American Journal of Tropical Medicine and Hygiene*, 100, 767–769.

Brown, N., Nemcik, J., & Petti, M. (2012). Sanitation master plan for Lusaka, Zambia. In *Proceedings of the Water Environment Federation* (2012, Issue 13, pp. 3266–3289). https://doi.org/10.2175/193864712811726969

Cairncross, S. (2003). Sanitation in the developing world: Current status and future solutions. *International Journal of Environmental Health Research*, 13(sup1), S123–S131. https://doi.org/10.1080/0960312031000102886

Caruso, B., Clasen, T., Yount, K., Cooper, H., Hadley, C., & Haardörfer, R. (2017). Assessing women's negative sanitation experiences and concerns: The development of a novel sanitation insecurity measure. *International Journal of Environmental Research and Public Health*, 14(7), 755. https://doi.org/10.3390/ijerph14070755

Chipuwa. (2019). The status of water and sanitation in newly planned residential areas in Lusaka: A case of Kwamwena Valley.

Chumo, I. (2021). Manual pit emptiers and their health: Profiles, determinants and interventions. https://www.researchgate.net/publication/353317434_Manual_Pit_Emptiers_and_Their_Heath_Profiles_Determinants_and_interventions

Chunga, R. M., Ensink, J. H. J., Jenkins, M. W., & Brown, J. (2016). Adopt or adapt: Sanitation technology choices in urbanizing Malawi. *PLOS ONE*, 11(8), e0161262. https://doi.org/10.1371/journal.pone.0161262

Cresswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.

ECA. (2018). Pit-emptying practices in Lusaka: How to encourage households to use safer and more environmentally friendly services. https://www.eca-uk.com/2018/06/21/pit-emptying-practices-in-lusaka-how-to-encourage-households-to-use-safer-and-more-environmentally-friendly-services

Eryilmaz, Ö. (2022). Are dissertations trustworthy enough? The case of a Turkish PhD. Dissertations on social studies education. *Participatory Educational Research*, 9, 344–361. https://doi.org/10.17275/per.22.70.9.3

Energy and Water Utilities Regulatory Authority (EWURA). (2020). *Guidelines for onsite sanitation and faecal sludge management for water and sanitation authorities*. https://www.maji.go.tz/uploads/publications/sw1640157846-18.%20Guidelines%20for%20Onsite%20Sanitation%20and%20Faecal%20Sludge%20Management%20for%

Gerring, J. (2004). What is a case study and what is it good for? *American Political Science Review*, 98, 341–354. https://doi.org/10.1017/S0003055404001182

Greene, N., Hennessy, S., Rogers, T. W., Tsai, J., & De Los Reyes III, F. L. (2021). The role of emptying services in provision of safely managed sanitation: A classification and quantification of the needs of LMICs. *Journal of Environmental Management*, 290, 112612. https://doi.org/10.1016/j.jenvman.2021.112612

Haruna, S. (2023). A phonological study of consonants and vowels phonemic merger in Hausa. *British Journal of Multidisciplinary and Advanced Studies*, 4, 45–59. https://doi.org/10.37745/bjmas.2022.0196

Harvey, P. A., & Reed, R. A. (2007). Community-managed water supplies in Africa: Sustainable or disposable? *Community Development Journal*, 42, 365–378. https://doi.org/10.1093/cdj/bsl001

Howard, G. (2021). The future of water and sanitation: Global challenges and the need for greater ambition. *Journal of Water Supply: Research and Technology-Aqua*, 70, 438–448. https://doi.org/10.2166/aqua.2021.127

Jenkins, M., Cumming, O., & Cairncross, S. (2015a). Pit latrine emptying behavior and demand for sanitation services in Dar Es Salaam, Tanzania. *International Journal of Environmental Research and Public Health*, 12(3), 2588–2611. https://doi.org/10.3390/ijerph120302588

Jenkins, M., Cumming, O., & Cairncross, S. (2015b). Pit latrine emptying behavior and demand for sanitation services in Dar Es Salaam, Tanzania. *International Journal of Environmental Research and Public Health*, 12(3), 2588–2611. https://doi.org/10.3390/ijerph120302588

Kakar, Z. U. H., Rasheed, R., Rashid, A., & Akhter, S. (2023). Criteria for assessing and ensuring the trustworthiness in qualitative research. *International Journal of Business Research*, 4, 150–173.

Keeves, J. P. (1997). *Educational research, methodology and measurement: Handbook an international handbook* (2nd ed.). Pergamon.

Kennedy-Walker, R., Amezaga, J. M., & Paterson, C. A. (2015). The role of power, politics and history in achieving sanitation service provision in informal urban environments: A case study of Lusaka, Zambia. *Environment and Urbanization*, 27(2), 489–504. https://doi.org/10.1177/0956247815583253

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher*, 42, 846–854. https://doi.org/10.1080/0142159X.2020.1755030

Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, 6, 26. https://doi.org/10.5430/ijhe.v6n5p26

Lerebours, A., Scott, R., Sansom, K., & Kayaga, S. (2021). Regulating sanitation services in sub-Saharan Africa: An overview of the regulation of emptying and transport of faecal sludge in 20 cities and its implementation. *Utilities Policy*, 73, 101315. https://doi.org/10.1016/j.jup.2021.101315

Mara, D. (2017). The elimination of open defecation and its adverse health effects: A moral imperative for governments and development professionals. *Journal of Water, Sanitation and Hygiene for Development*, 7(1), 1–12.

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McConville, J. R., Kvarnström, E., Jönsson, H., Kärrman, E., & Johansson, M. (2017). Source separation: Challenges & opportunities for transition in the Swedish wastewater sector. *Resources, Conservation and Recycling*, 120, 144–156. https://doi.org/10.1016/j.resconrec.2016.12.004

Mensah, J., Mattah, P. A. D., Amoah, J. O., & Mattah, M. M. (2022). Public compliance with environmental sanitation regulations in Ghana. *Open Health*, 3(1), 1–12. https://doi.org/10.1515/openhe-2022-0001

National Rural Water Supply and Sanitation Program. (2006). National Water Supply and Sanitation Council (NWASCO), Lusaka, Zambia.

National Water and Sanitation Council. (2018). Urban onsite sanitation and faecal sludge management framework for provision and regulation in Zambia. https://www.susana.org/_resources/documents/default/3-3327-7-1530187197.pdf

Osborne, N., & Grant-Smith, D. (2021). In-depth interviewing. In S. Baum (Ed.), *Methods in Urban Analysis, Cities Research Series* (pp. 105–125). Springer Singapore. https://doi.org/10.1007/978-981-16-1677-8_7

Peletz, R., MacLeod, C., Kones, J., Samuel, E., Easthope-Frazer, A., Delaire, C., & Khush, R. (2020). When pits fill up: Supply and demand for safe pit-emptying services in Kisumu, Kenya. *PLOS ONE*, 15(9), e0238003.

Rajapakse, J., Otoo, M., & Danso, G. (2023). Progress in delivering SDG6: Safe water and sanitation. *Cambridge Prisms Water*, 1, e6. https://doi.org/10.1017/wat.2023.5

Robinson, R. S. (2014). Purposive sampling. In A. C. Michalos (Ed.), *Encyclopedia of Quality of Life and Well-Being Research* (pp. 5243–5245). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2337

Sauce, B., & Matzel, L. D. (2017). Inductive reasoning. In J. Vonk & T. Shackelford (Eds.), *Encyclopedia of Animal Cognition and Behaviour* (pp. 1–8). Springer International Publishing. https://doi.org/10.1007/978-3-319-47829-6_1045-1

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Financial Times Prentice Hall.

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, 5(9), 9. https://doi.org/10.5539/elt.v5n9p9

Sibiya, J., & Gumbo, J. (2013). Knowledge, attitude and practices (KAP) survey on water, sanitation and hygiene in selected schools in Vhembe District, Limpopo, South Africa. *International Journal of Environmental Research and Public Health*, 10(6), 2282–2295. https://doi.org/10.3390/ijerph10062282

SNV. (2024). Advancing sanitation governance in Zambia: A snapshot of the strengthened regulations for onsite sanitation and faecal sludge management. https://www.snv.org/assets/downloads/f/191310/x/477d30c695/2024-advancing-sanitation-governance-zm-snv.pdf

Sommer, I., Griebler, U., Mahlknecht, P., Thaler, K., Bouskill, K., Gartlehner, G., & Mendis, S. (2015). Socioeconomic inequalities in non-communicable diseases and their risk factors: An overview of systematic reviews. *BMC Public Health*, 15(1), 914. https://doi.org/10.1186/s12889-015-2227-y

Trémolet, S. (2013). Sanitation economics: Understanding why sanitation markets fail and how they can improve. *Waterlines*, 32, 273–285. https://doi.org/10.3362/1756-3488.2013.029

Strauss, D. F. M. (2002). The scope and limitations of Von Bertalanffy's systems theory. *South African Journal of Philosophy*, 21(3), 163–179. https://doi.org/10.4314/sajpem.v21i3.31343

Suri, H. (2011). Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal*, 11, 63–75.

Tidwell, J. B., Chipungu, J., Chilengi, R., & Aunger, R. (2018). Assessing peri-urban sanitation quality using a theoretically derived composite measure in Lusaka, Zambia. *Journal of Water, Sanitation and Hygiene for Development*, 8, 668–678.

Tomoi, H., Ingumba, B. B., Simiyu, S., Otteng, E., Osewe, J., Majiwa, H., Braun, L., Cumming, O., & Moriyasu, T. (2025). Barriers and enablers for group-based manual emptying services for onsite sanitation facilities in Nairobi, Kenya: A qualitative study. *International Journal of Hygiene and Environmental Health*, 267, 114595. https://doi.org/10.1016/j.ijheh.2025.114595

United Nation General Assembly. (2010). The human right to water and sanitation (108th Plenary Meeting).

United Nations. (2015). *Transforming our world: The 2030 Agenda for Sustainable Development*. https://sdgs.un.org/2030agenda

Water Aid. (2013). Living conditions and sanitation crisis in Chainda Shanty Compound, Zambia. Water Aid.

Wilkinson, L. A. (2011). Systems theory. In S. Goldstein & J. A. Naglieri (Eds.), *Encyclopedia of Child Behavior and Development* (pp. 1466–1468). Springer US. https://doi.org/10.1007/978-0-387-79061-9_941

World Health Organisation/United Nations Children's Emergency Fund. (2021). *Progress on household drinking water, sanitation and hygiene 2000-2020: Five years into the SDGs*. Geneva.

Yip, C., Han, N.-L., & Sng, B. (2016). Legal and ethical issues in research. *Indian Journal of Anaesthesia*, 60(9), 684. https://doi.org/10.4103/0019-5049.190627

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Prevalence and individual factors associated with first maternal delay in Nakuru County, Kenya

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ABSTRACT

Globally, about 700 mothers die daily during pregnancy, labor, or childbirth, a steadily increasing trend, where 40% of the cases were linked to first maternal delay. Mothers who are experiencing a first delay are at risk of facing a number of health problems, accelerating other forms of maternal delays. The research seeks to determine the prevalence and the associated individual factors of first maternal delay in Nakuru County, Kenya. This will help to formulate strategies for reducing cases of preventable maternal mortality. A cross-sectional study design was employed. The research employed 211 antenatal mothers located in eight level 3 health center facilities in Nakuru County. Conveniently, study participants were selected based on inclusion criteria and data collected using a structured questionnaire. Data analysis was conducted through descriptive statistics and chi-square tests while maintaining a significance threshold at $p < 0.05$. Results: 82.5% of the mothers experienced first maternal delay, while some were exposed to either second (35.6%) or third (29.4%) maternal delay, implying that the 3 types of maternal delays are interconnected and dependent on each other. It further established that it was not only necessary for one to have experienced any form of complication to be linked to first maternal delay. The statistically identified individual factors included attendance of antenatal clinic (ANC) (aOR 4.1, 95% CI = (1.03-17.05), $p < 0.010$); past negative experience (aOR 0.15, 95% CI = (0.03-0.64), $p < 0.010$); and prolonged time taken to make the decision to seek care (after 1 hour, aOR 3.26, CI = (1.32-8.02), $p < 0.010$). Contrary: personal decision-making of when to seek care during an emergency (aOR 0.34, 95% CI=(0.12-0.97)); time taken to decide to seek care after realizing a health issue (immediately, aOR 0.03, 95% CI=(0.01-0.21) & after 30 minutes, aOR 0.07, 95% CI=(0.01-0.66)); and knowledge of maternal delay to be a protective individual factor for not experiencing first maternal delay. Conclusion: The study confirmed that several individual factors were significantly associated with first maternal delay. Recommendation: The health authorities need to develop policies supporting mothers' autonomy and empowerment to enhance and promote their own care-seeking decision-making and to inject more resources targeting ANC mothers to ensure timely utilization of ANC and delivery services and improve ANC uptake to reduce maternal mortality related to first maternal delay. This initiative will aid in achieving the set WHO target by 2030 and improve maternal outcomes and increase the quality of life for both the mother and that of the infant(s).

Keywords: First Maternal Delay, Individual Factors, Kenya, Nakuru County, Prevalence

I. INTRODUCTION

First maternal delay is considered the time interval from the first onset of any obstetric emergency situation to the time in making the decision to seek emergency obstetric care from the health facility, and any time longer than the expected time (one hour) (Orwa et al., 2023). The time taken to get to the healthcare facilities due to delay in decision-making contributes immensely to maternal morbidity and mortality (Tiruneh et al., 2022). Erega et al. (2024) reported that the time mothers take to decide to seek care may lead to delays in getting to the healthcare facilities, which may contribute greatly to other unnecessary complications. Previous studies have linked maternal delay with increasing rates of maternal deaths (Riese & Dhakal, 2023).

According to the World Health Organization (2025), globally, about 260,000 mothers died in the year 2023 during pregnancy, delivery, or the postnatal period, making maternal mortality a significant public health challenge, despite ongoing efforts to improve maternal health (Khalil et al., 2023). The three maternal delay models were introduced by Thaddeus and Maine in 1994 and were linked as the key contributors to maternal mortality (Mohammed et al., 2020). Delay is a negative behavior requiring urgent intervention to enable one to act promptly without postponement (Collins, 2025).

Unfortunately, African countries doubled the maternal mortality rate (MMR) at 531 per 100,000 live births (LB), accounting for 92% of all global maternal deaths. Sub-Saharan African (SSA) countries including South Sudan,

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Chad, and Nigeria are among the leading maternal mortality contributors, with 1,223, 1,063, and 1,047 per 100,000 LBs respectively, where delay in making the decision to seek healthcare alone contributed to 36% of maternal deaths in SSA (Geremew et al., 2025). In addition, 40% of all preventable deaths in Ethiopia have been linked to first maternal delay, an unacceptably high rate, while delay in receiving appropriate care represented 22% of maternal deaths (WHO, 2025), at the individual or community level (Mohammed et al., 2020), prompting the urgent need to improve maternal health care (Ersboll & Pal, 2025) to preserve the well-being of the mother, a critical ingredient of future generations (Błachnio & Kuryś-Szyncel, 2022).

The magnitude of maternal delays has been reported in several previous studies. Saffa et al. (2024) identified the prevalence of first maternal delay to be 23.3%, while 26.9% accounted for the second maternal delay. According to Debela et al. (2024), 46.8% of the mothers experienced first maternal delay and 44% and 31% experienced second and third maternal delays respectively. A study in Northern Ethiopia revealed that nearly half (47.2%) of the mothers experienced first delay, 71.3% of the respondents experienced second maternal delay, and 10.2% third maternal delay, while in developing countries, upward magnitude of first, second, and third maternal delays were realized as follows: 71%, 40%, and 79%, respectively (Amante et al., 2025).

Although various studies documented major causes of maternal deaths to be both direct and indirect causes, a study conducted in Zambia by Ngoma-Hazemba et al. (2019) pointed out that first maternal delay contributes highly to maternal deaths. Actis Danna et al. (2020) reported that delay in making the decision to seek care is largely determined by power relationships between the couple and extended family. The power of decision-making is solely an essential factor influencing the utilization of maternal health care services (Mutowo et al., 2021). It is important to note that every pregnant mother needs good health, good food, love, and support from her family and the community, but pregnancy can be one of the main dangers a woman faces in her life (Guides, 2024). The White House (2022) declared that pregnant mothers also need to be heard and be made sole decision-makers in any accountable system of care, to be able to improve their quality of care.

Further, Kenya was identified with an increasing maternal death rate of 55% in the years 2017–2022, recording an MMR of 530/100,000 LB and ranked 10th globally (World Health Organization, 2023). Previous studies linked this increased death rate and complications to women with limited decision-making power since they were less likely to access essential antenatal, skilled delivery, and postnatal care, which were vital in reducing maternal mortality (Haile et al., 2024). Only 4% of ANC mothers completed their WHO-recommended eight or more visits and 29% commenced their first ANC visit during their first trimester (Kenya Demographic Health Information System [KDHIS], 2022). This trend makes the health system unable to detect complications early and manage them, putting the mother at risk of dying, especially if intervention was delayed. Riese and Dhakal (2023) revealed that most maternal deaths were contributed majorly by first maternal delay among the other delays.

Nakuru County's MMR was 375 per 100,000 LBs, higher than the national figure, despite it having the best health infrastructures ranked third nationally. Moreover, it has high numbers of health workforce per its population compared to other counties; health insurance coverage of 40.7% ranked first nationally; and very good county budgetary allocation at 35% nationally (Institute of Public Finance, 2023). In addition, the county is being supported by NGOs (APHIA-NYOTA/UTJ/DANIDA) and FBOs. They provide essential drugs and equipment as well as aid in employment of staff to curb shortages, but the county is still lagging behind in terms of maternal health utilization, questioning the issues around delay in making the decision to seek care documented in the MPDSR Review June 2024 report (County Government of Nakuru, 2024).

This study seeks to find out if there is some relationship between lack of awareness of complications and late response to emergency care. Failure to recognize danger signs during ANC clinic and other individual contributory factors may lead to delay in making the decision to seek care (World Health Organization, 2021). Therefore, there is need to look for push and pull factors that hinder ANC mothers from making the decision to seek care early. WHO recommends reduction of at least 20.3% maternal mortality each year, reaching sustainable development goals (SDGs) targeting at least 70 per 100,000 LBs by the year 2030 (World Health Organization, 2023), projecting the need to deal with first maternal delay, where prompt and timely maternal decision to report to ANC care is warranted.

1.1 Research Objectives

i. To determine the magnitude of maternal delay in Nakuru County Kenya.
ii. To assess individual factors associated to first maternal delay in Nakuru County, Kenya.

II. LITERATURE REVIEW

Every pregnant woman needs good health, good food, love, and support from her family as well as the community. Unfortunately, pregnancy can be one of the main dangers a woman may face in her life (Guides, 2024). According to World Health Organization (2023), maternal health refers to the health of women during pregnancy,

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childbirth, and 42 days after delivery (postpartum period). To maintain this good health, much effort must be put into the five principles of good maintenance of health during pregnancy, which include: increasing access to and coverage of comprehensive high-quality maternal health services by ensuring that everyone is included in the health insurance system; mothers giving birth are heard and are decision-makers in accountable systems of care by improving quality of care and creating a system where the mothers and the families are heard and respected; integrating all systems of care with the aim of obtaining advanced data collection, standardization, harmonization, transparency, and conducting research; expanding and diversifying the perinatal workforce to cover health workforce shortages and to maintain maternal health; and lastly, strengthening economic and social supports for people before, during, and after pregnancy to uplift and empower the mothers (The White House, 2022).

Despite good maternal health, maternal mortality may arise due to complications from pregnancy or childbirth within 42 days after birth or termination of pregnancy, not including deaths due to accident or violence (Orwa et al., 2023). Hemorrhage associated with a lack of resources, unskilled birth attendance, delivery in ill-equipped facilities, and shortage of essential obstetric care supplies such as blood transfusion could be major reasons (World Health Organization, 2025). In addition, poor health-seeking behavior, long distances to health facilities, and lack of transport to tertiary facilities have also been linked to maternal mortality in sub–Saharan Africa.

Universal Health Coverage (UHC) is a key component of a sustainable goal that aims to "ensure healthy lives and promote the wellbeing of all ages" by accessing quality care services they need without going through financial constraints (World Health Organization, 2021). In addition, the government of Kenya introduced the removal of a user fee to facilitate improved access to maternity care services and reduction of mortality. However, despite these interventions, Kenya is still tackling the challenge of high MMR (Orangi et al., 2021), increasing by 55% between the years 2017 and 2020 (World Health Organization, 2025). Notably, most counties, including Nakuru, Narok, and Laikipia, have shown declining records of 4th ANC coverage of 53% (County Government of Nakuru, 2024), which is quite below that of the WHO recommendation (80%), despite them being among the counties utilizing Linda Mama.

According to Tiruneh et al. (2022), maternal delay was considered to have happened when the time interval from the first onset of any obstetric emergency situation to any form of emergency obstetric care from the health facility is longer than the expected time (one hour). Mohammed et al. (2020) adopted the distinguished three types of maternal delay by Thaddeus and Maine (1994), namely: first maternal delay is delay in deciding to seek care; second delay is delay in reaching health facilities; and third maternal delay is delay in receiving care in health facilities. Although some studies have pointed out that the three types of maternal delays are intertwined with each other and operate in a synergetic manner, this may lead to delays in receiving life-saving interventions required, increased complications, and higher maternal and child mortality morbidity rates (Orwa et al., 2023). Also, according to Tiruneh et al. (2022), the identified three types of maternal delays are interconnected and dependent on one another. Addressing the first type of delay accelerates the action for the second and subsequently third maternal delay, hence helping to curb maternal mortality and improve the quality of life of the mother and the unborn baby(s).

First maternal delay is any form of delay in the decision-making process to seek care during emergency, which may have been attributed to: failure to recognize danger signs; lack of money to pay for medical expenses and cost of transportation; fear of being ill-treated in the health facility; reluctance from the mother or the family due to cultural constraints; the woman or family member present at childbirth lacking power to make decisions; lack of encouragement from relatives and community members to seek care; and/or no person available to take care of the other children at home or even livestock, if present (Chauke, 2025).

Power of decision-making is solely the essential factor influencing the utilization of maternal health care services (Mutowo et al., 2021). According to Tiruneh et al. (2022), delay in making the decision to seek care contributed to high maternal mortality and morbidity in developing countries. Delay in making the decision to seek healthcare alone attributed to 36% of maternal deaths in SSA (Geremew et al., 2025). A study conducted in Ethiopia accounted for 40% of causes of MMR to delay in making the decision to seek maternal care (World Health Organization, 2023).

The time taken to get to the healthcare facilities due to delay in decision-making contributes immensely to maternal morbidity and mortality (Tiruneh et al., 2022; Erega et al., 2024). To combat maternal mortality related to first maternal delay, focus on mothers needs to be emphasized, giving the mothers health messages as a part of intervention to combat first delay (Fernandes, 2020).

Individual factors, including socio-demographic characteristics such as age, maternal education, and marital status, were identified to be among the contributing factors to first maternal delay (Orangi et al., 2021; Riese & Dhakal, 2023; Ishimwe, 2025). Moreover, any experience one gets at their first instance during any service delivery may influence any outcome of interest, either positively or negatively. According to a study by Amani (2020), mothers were exposed and shown being beaten, abused, and had no form of privacy while giving birth, indicating that the way one receives clients in the health facilities would determine their outcomes and the continuity of service.

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III. METHODOLOGY

The researcher employed a cross-sectional study design to help determine the prevalence of first maternal delay in Nakuru County, one of the 47 counties in Kenya. By utilizing this design, the researcher measured and analyzed the outcome variable. The target population was women above 18 years of age within Nakuru County attending ANC clinics. The study population was pregnant mothers at their 28–32 weeks gestation who were attending ANC at the selected health facilities in Nakuru County. All pregnant mothers who met the criteria but did not consent to participate in the study, and those ANC mothers who met the criteria but were not continuing with the clinic in the selected health facilities, were excluded from the study.

Multistage cluster sampling was employed to cluster the sub-counties and the level 3 health facilities for the study site. A total of 24 level 3 public health facilities are distributed among 11 sub-counties, where a third of these were identified as study sites (8 level 3 health facilities), from a randomized sample frame. The study facilities identified included Rongai H/C, Upper Solai H/C, Kabatini H/C, Kapkures H/C, Lanet H/C, Sachangwan H/C, Ronda H/C, and Mau Narok H/C.

The researcher used Fleiss formula for Statistical Methods for Rates and Proportions, 1981, in the sample size determination, which is a suitable method for comparing two proportions (Ghazi, 2020). From the calculations, a total sample size of 202 was determined, and to address attrition rate and non-respondent rate, 10% was added to the minimum sample to get 224 participants for the study.

Conveniently, study participants were selected based on inclusion criteria introduced to data collection using a structured questionnaire. This method was suitable especially when dealing with clear research purposes, allowing the researcher to target individuals with specific attributes relevant to the study (Bisht, 2024). The researcher adopted and modified a questionnaire used in a study conducted by Riese and Dhakal (2023), "Understanding the Three Delays among Postpartum Women at Health Facilities in Nepal." The developed questionnaire was used to collect data to achieve the objectives of the study, with the aid of the existing national standardized Ministry of Health (MOH) ANC register (MOH 405) employed in all ANC clinics in the country (MOH, 2016 register).

Reliability and validity of the tool were assessed to determine whether the research provides a good measure for the study (Sago, 2023). Cronbach's Alpha test is one of the commonly used statistical tools for assessing reliability of research instruments, whose coefficient measures internal consistency for a set of items to show how well they collectively captured the intended construct (Saputra, 2025). The sample for the pre-test used in this study comprised 10%, where 23 ANC mothers were randomly sampled, considering those who had the same characteristics as the respondents in the study area, with the primary aim of instrument reliability testing using SPSS Version 29, and the coefficient analyzed yielded 0.723. This revealed a strong and acceptable internal consistency of the questionnaire. In addition to the test done, to minimize deviation from the true measurements, the researcher trained research assistants and nurses on the use of data collection tools and closely supervised research assistants during data collection. Validity of the tools was also ensured.

The study was conducted after obtaining approvals and clearance from the relevant authorities, which included: Masinde Muliro University of Science and Technology Institutional Scientific and Ethics Review Committee (MMUST-ISERC) - MMU/COR:40312VOL6(01); National Commission for Science and Technology (NACOSTI) - NACOSTI/P/25/416331; an official data collection permission letter from County Government of Nakuru County - NCG/PSM/2/13 VOL.1(70); County Commissioner of Nakuru County – CC.SR.EDU.12/1/2/VOL.VIII/65; Ministry of Education Nakuru County – CDE/NKU/GEN/4/1/21 VOL.IV/111; and also the Chief Executive Officer of Health (CEOH) Nakuru County through the County IERC – CGN/CDPH/RES/2025/1137.

Written informed consent was also obtained from the ANC mothers before data collection. The software used to analyze the data for this study was Statistical Package for Social Sciences (SPSS) version 29.0. The analysis of socio-demographic and reproductive characteristics relied on descriptive statistics, while inferential statistics using Chi-square tests were used to compare associations between independent and dependent variables. Statistical significance occurred when the p-value was below 0.05. The research findings were presented using tables and figures, which helped ensure clear understanding and aided in interpretation.

IV. FINDINGS & DISCUSSION

4.1 Socio-Demographic Information

This study utilized 224 participants, with one questionnaire given to each participant to fill out. However, only 211 participants completely filled the questionnaire, representing a 94.2% response rate. The 5.8% (n = 13) respondents were excluded during the analysis process due to incomplete responses in some parts of the questionnaire.

Table 1 presents the socio-demographic characteristics of the study participants, where 105 of the participants were in the intervention group and 106 in the control group. In both groups, the majority of the participants were

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between the ages of 25–30 years (39.1% in the intervention group and 34.0% in the control group). The mothers' education background was significantly different between the intervention and control groups: 62 (59%) women in the intervention group had completed secondary school, followed by 18 (17%) women who had not completed secondary education. In the control group, 50 (47%) had completed secondary education, followed by 18 (17%) who had attained tertiary education.

Marital status was common between the intervention and control groups, with the majority being married, 81.9% and 78.3% respectively, and the least being widowed, 0% and 1.9% in the intervention and control groups, respectively. The husbands' educational background was also similar in the two groups, with 48.6% and 38.7% having completed secondary education, and the least being no education with 0% and 0.9% in the intervention and control groups, respectively. The mothers' occupation was different between the intervention and control groups. In the intervention group, 54 (51.4%) women had no occupation and none (0%) had other occupations, while in the control group, 50 (47.2%) of the women had no employment but 17 (16.0%) had formal employment. Regarding the husbands' occupation, in the intervention group the majority were farmers, 27 (25.7%), and 21 (19.8%) in the control group. An equal number, 17 (16.0%), were in formal employment in both groups.

Table 1

Summary of the Socio-Demographic Characteristics of the Study Participants, n=211 women

Variable	**Interventions, n=105**	**Controls, n=106**
	Frequency (%)	**Frequency (%)**
Age		
18-24	31 (29.5)	32 (30.2)
25-30	41 (39.1)	36 (34.0)
31-36	20 (19.0)	21 (19.8)
37+	13 (12.4)	17 (16.0)
Mother's educational background		
None	1 (1.0)	2 (1.9)
Primary not completed	6 (5.7)	2 (1.9)
Primary completed	5 (4.8)	19 (17.9)
Secondary not completed	18 (17.1)	15 (14.2)
Secondary completed	62 (59.0)	50 (47.2)
Tertiary-college/university	13 (12.4)	18 (17.0)
Marital status		
Married	86 (81.9)	83 (78.3)
Single	18 (17.1)	17 (16.0)
Widowed	0 (0.0)	2 (1.9)
Divorced/ separated	1 (1.0)	4 (3.8)
Husbands educational background		
None	0 (0.0)	2 (1.9)
Primary not completed	2 (1.9)	3 (2.8)
Primary completed	5 (4.8)	3 (2.8)
Secondary not completed	5 (4.8)	8 (7.5)
Secondary completed	51 (48.6)	41 (38.7)
Tertiary-college/university	23 (21.9)	26 (24.5)
Mother's occupation		
None	54 (51.4)	50 (47.2)
Formal employment	16 (15.2)	17 (16.0)
Farmer	7 (6.7)	12 (11.3)
Business	28 (26.7)	21 (19.8)
Other	0 (0.0)	6 (5.7)
Husband's occupation		
None	3 (2.9)	4 (3.8)
Farmer	27 (25.7)	21 (19.8)
Formal Employment	17 (16.2)	16 (15.1)
Business	37 (35.2)	37 (34.9)
Other	2 (1.9)	5 (4.7)

In addition, the reproductive history of the respondents in the intervention and control groups showed the majority to be multigravidas, 86.7% and 92.5% respectively. The number of miscarriages experienced was similar in both groups, with the majority having no history of miscarriage (intervention = 77.1% and control = 76.4%).

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Approximately 22% of participants in both intervention and control groups had experienced one miscarriage, and 1% had experienced two or more miscarriages.

In the intervention group, 89.5% delivered in health facilities, 9.5% at home, and 1% on the road, while in the control group, 88.7% delivered in health facilities, followed by 6.6% who delivered on the road, and the least, 4.7%, delivered at home.

Experience of ANC/PNC services was similar in the intervention and control groups, with the majority (intervention = 53.3% and control = 67.9%) being satisfied, while 22% and 20.8% were not satisfied with the services in the intervention and control groups, respectively. Attendance at ANC was significantly different between the intervention and control groups: 84.8% (n = 89) attended ANC in the intervention group, while 97.2% (n = 103) in the control group attended ANC, with only 2.8% not attending ANC visits.

In both the intervention and control groups, 66.7% of the participants attended 1 to 3 ANC visits in their previous pregnancies. However, only 18.1% of the intervention group attended 4 or more ANC visits, while 30.2% of the control group attended 4 or more ANC visits. There was a significant difference in planned pregnancies between the intervention and control groups. The majority (52.4%, n = 55) of the intervention group did not plan their pregnancies, while 61.3% (n = 65) of the control group planned their pregnancies.

Table 2

Summary of the Reproductive History of the Study Participants, n=211

Variable	**Interventions, n=105**	**Controls, n=106**
	Frequency (%)	**Frequency (%)**
Number of pregnancies		
Multigravida (2-4)	91 (86.7)	98 (92.5)
Grand gravida (5+)	14 (13.3)	8 (7.5)
Miscarriages		
0	81 (77.1)	81 (76.4)
1	23 (21.9)	24 (22.6)
2+	1 (1.0)	1 (0.9)
Place of delivery		
Health facility	94 (89.5)	94 (88.7)
Home	10 (9.5)	5 (4.7)
Other	1 (1.0)	7 (6.6)
ANC Attendance		
Yes	89 (84.8)	103 (97.2)
No	16 (15.2)	3 (2.8)
Frequency of ANC Visits		
0	16 (15.2)	4 (3.8)
1-3	70 (66.7)	70 (66.7)
4+	19 (18.1)	32 (30.2)
Planning of Pregnancy		
Yes	50 (47.6)	65 (61.3)
No	55 (52.4)	41 (38.7)
Experience of ANC/delivery Services		
Satisfied	26 (24.8)	16 (15.1)
Not satisfied	30 (28.6)	31 (29.2)
Somehow not satisfied	49 (46.7)	59 (55.7)

4.2 Prevalence of First Maternal Delay in Nakuru County

4.2.1 Maternal Delays in Nakuru County

First, second, and third maternal delays were experienced by participants in the study. At baseline, both intervention and control groups experienced maternal delays, with the majority being first maternal delay at 82.5% (n = 174) (intervention = 78.1%, n = 82; control = 86.8%, n = 92). In the intervention group, 34.3% and 23.8% of participants experienced second and third maternal delays at baseline, while in the control group, 36.8% and 27.4% of participants experienced second and third maternal delays, respectively. This was supported by the KII findings, which rated the level of first maternal delay as more common, as stated below:

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"First maternal delay is more common in this area, especially for the mothers who were seeking ANC clinic, despite alighting to them on the importance of coming to ANC clinic immediately they experience any alarming sign. Some of them had their own reasons why they were not even coming for ANC clinic" (NAK/KII4).

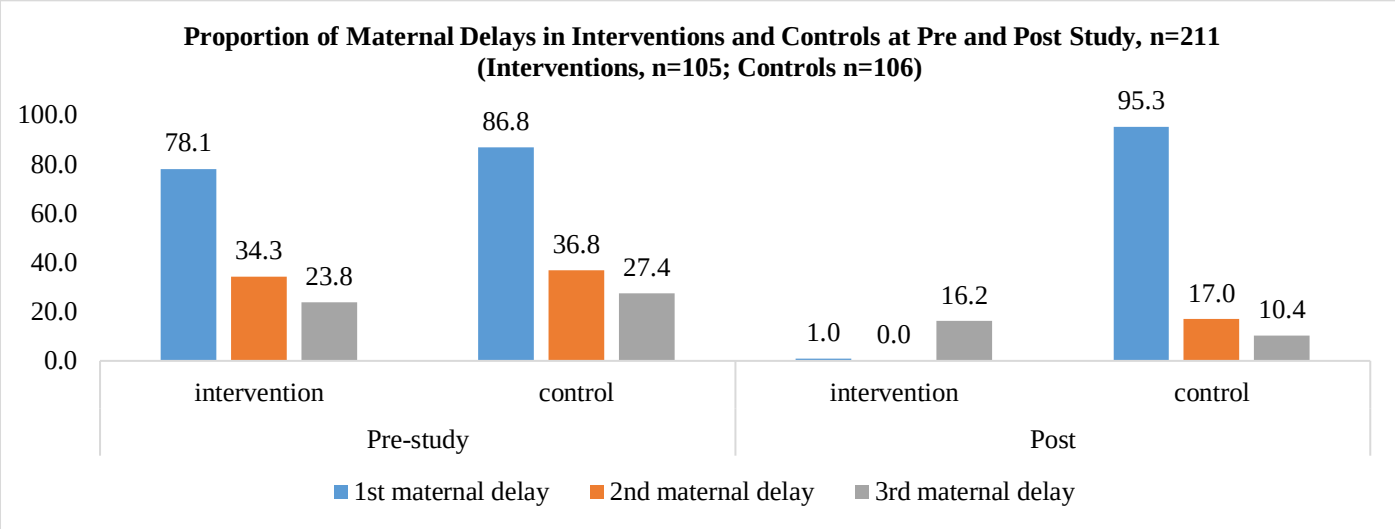

Figure 1
Proportion of Maternal Delays in Intervention and Control Group, Comparing Pre-Study and Post-Study

In addition, Figure 2 below presents the map describing the study site as well as the distribution of first maternal delay

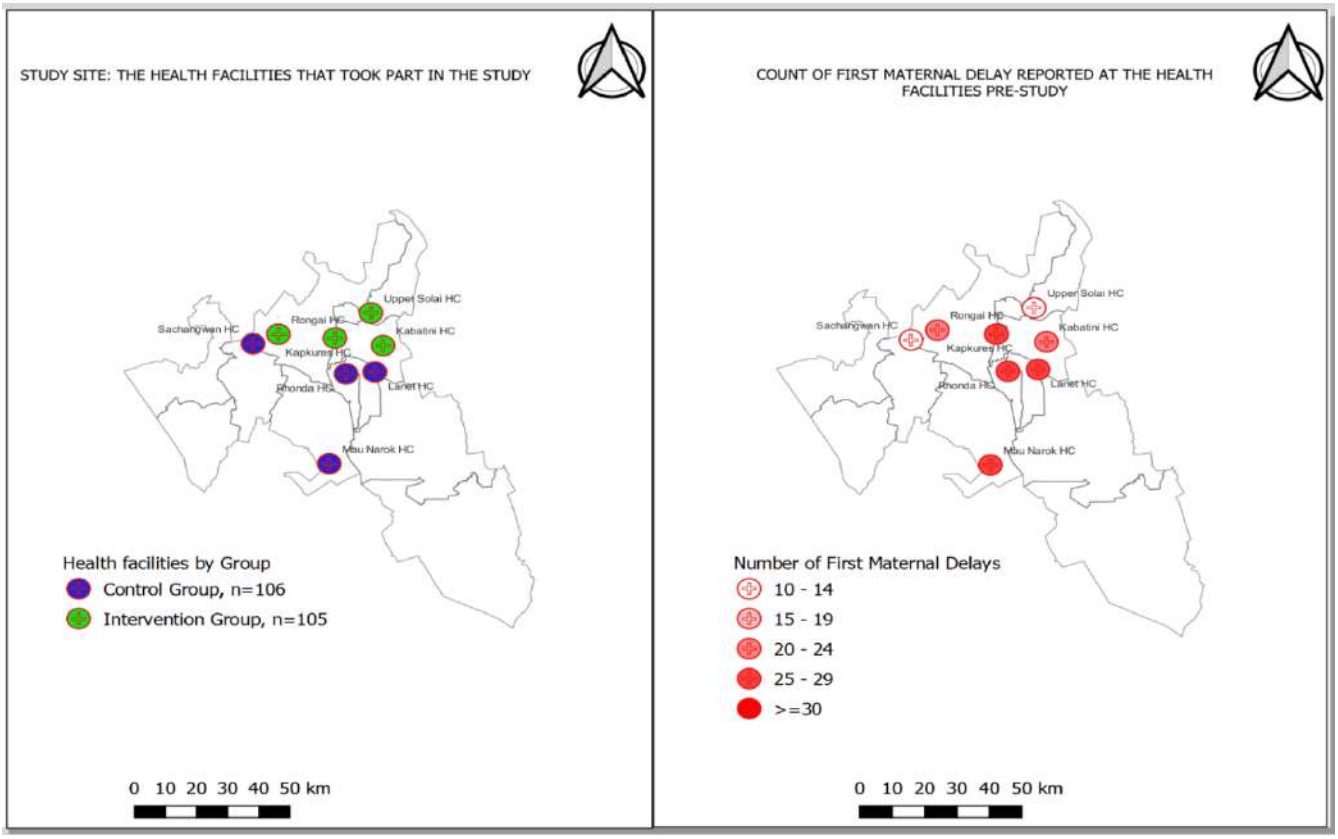

Figure 2
Distribution of First Maternal Delays in the Study Population by Sub County,
Source: Map Produced using QGIS by the Researcher

From this study, the overall burden of first maternal delay experienced was 82.5% (n = 174) during the baseline study in both the intervention and control groups. These high rates justify the barriers ANC mothers encounter in making

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the decision to seek care and the past experiences in the health facility, as shown by other studies. This rate was higher compared to other studies, which presented rates of 72%, 44%, 41.2%, 23.3%, and 21.8% in LMICs (Amante et al., 2025; Debela et al., 2024; Boka et al., 2023; Saffa et al., 2024, respectively).
These differences with other studies might be due to variations in study methodologies, populations, cultural factors, and health facilities used, contributing to such discrepancies in findings.

Table 3
Statistical Analysis of the Individual Factors

Individual Factor	**AOR (CI)**	**p-value**
Age		
18-24	0.57 (0.18, 1.82)	0.344
25-30	0.90 (0.32, 2.54)	0.846
31-36	0.80 (0.26. 2.48)	0.696
37+		
Parity		
2-4	1.51 (0.58, 3.82)	0.404
5+		
Miscarriages		
0	0.60 (0.21, 1.71)	0.341
1	0.61 (0.17, 2.26)	0.463
2+		
Attendance of ANC		
Yes	5.79** (1.53, 21.92)	0.010
No		
No. ANC Visits		
0		
1-3	0.61 (0.27, 1.36)	0.226
4+	1.00	
Planned Pregnancy		
Yes	0.60 (0.31, 1.17)	0.135
No		
Decision-maker		
Myself	0.14 (0.06, 0.33)	0.001
Husband	1.14 (0.35, 3.56)	0.856
Jointly		
Religion support		
Yes	0.39 (0.11, 1.46)	0.162
No		
Time to decide to seek care		
After one hour	3.26 (1.32, 8.02)	0.010
Immediately	0.60 (0.28, 1.27)	0.180
Within 30 minutes	0.28 (0.06, 1.30)	0.103
Don’t know		
Knowledge on maternal delay		
Yes	0.19 (0.09, 0.41)	0.001
No	1.87 (0.17, 20.18)	0.608
Experience of ANC/delivery services		
Satisfied	4.31 (1.48, 12.56)	0.010
Not satisfied		

In this study, dependent decision-making, attendance of ANC, and time taken to decide to seek care were the statistically significant individual factors influencing first maternal delay in pregnant women, while knowledge of maternal delay and making one’s own personal decision were protective factors against experiencing maternal delay.

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The study revealed that participants who made personal care-seeking decisions had an 86% chance of not experiencing first maternal delay (AOR = 0.14, confidence interval of less than 1), which reflects a significant association compared to their counterparts who depended on significant others for making the decision to seek care during an emergency or complication. This finding was contrary, and higher, compared to Amante et al. (2025), who reported that 90.5% of the respondents mainly decided by themselves to seek care, and a significantly lower percentage (9.5%) followed their husband's decision. In addition, Sumankuuro et al. (2019) demonstrated that cultural exposure can lead mothers to not utilize timely and appropriate maternal care, significantly impacting their use of maternal services and being associated with poor maternal health outcomes. Also, a study conducted by Tiruneh et al. (2022) had similar results, showing that most men make household decisions and control all the resources, dictating when and where mothers should seek maternal health care. According to Masaba and Mmusi-Phetoe (2023), the spouse's decision has the power to hinder some mothers during emergencies from making prompt decisions to seek care in time of need, thus delaying the process and leading to first maternal delay. Moreover, Kassa et al. (2023) alluded that domestic violence determines the extent to which a mother can make prior decisions to seek care during an emergency, since they depend on their husband's decision for their own health, which might delay the decision-making process to seek care when emergency intervention is needed. Unfortunately, when the spouse or the in-laws are left to make decisions to seek care, they may delay the process, which may lead to first maternal delay (Saputra, 2025).

The informed decision provided to the mother was important, as it promoted prompt care-seeking decision-making and subsequently saved the life of the mother and that of the baby. Prompt recognition and decision-making, along with knowledge of maternal delay, were crucial in the decision-making process. Further, Figure 2 below presents the response in time taken to make the decision to seek care after recognizing an emergency situation or complication.

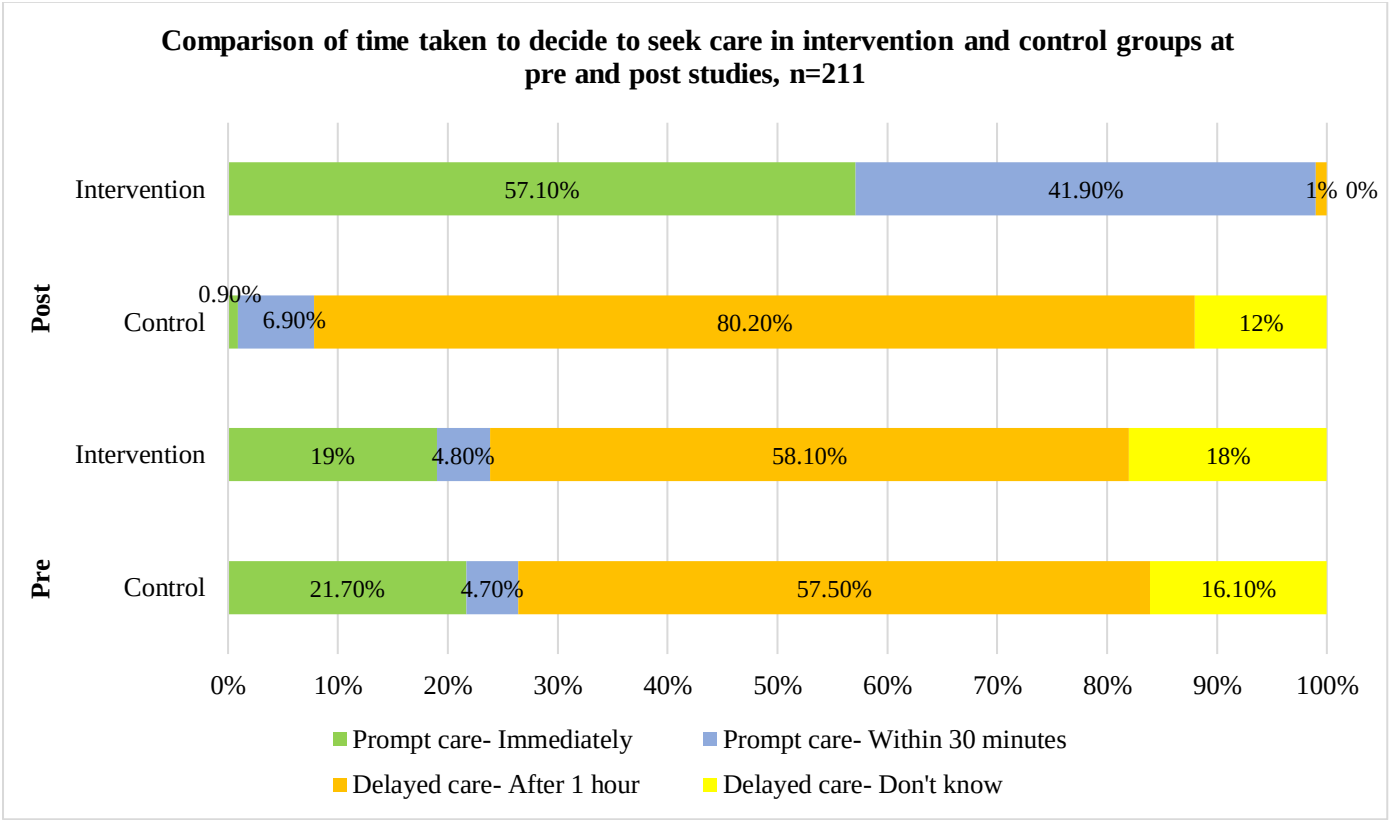

Figure 2

Comparison of Time taken to Decide to Seek Care between the Intervention and Control Group, n=211

The study found that delay in making the decision to seek care was high in both groups at baseline, with 58.1% of respondents in the intervention group and 57.5% in the control group making the decision to seek care after one hour. The study also established that mothers who took more than one hour to make the decision to seek care were 3.26 times more likely to experience first maternal delay (AOR = 3.26, CI = 1.32–8.02), compared to their counterparts who sought care within 30 minutes or immediately. Such delays often arise from a lack of awareness about the importance of early ANC attendance, fear of mistreatment by healthcare providers, or inadequate supplies in public health facilities. These findings were inconsistent with studies in similar low-resource settings, where delay in making the decision to seek care has been associated with maternal deaths linked to first maternal delays. This was supported by a study by Orwa et al.

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(2023), who reported that 'a mother who stays for an average of 1.76 hours at home to make the decision to seek healthcare services had a 51% magnitude of experiencing first maternal delay (95% CI: 46.0, 56.0).' Similar findings were reported by Tiruneh et al. (2022) and Erega et al. (2024).

This finding shows that a shorter time taken in making the decision to seek care is a prominent indicator of good survival if prompt intervention is facilitated. Therefore, there is a need to empower mothers to identify early their own need for care and to make prompt, independent choices about their own health, thereby saving time that might be wasted during the decision-making process.

Surprisingly, in this study, the risk factor that significantly contributed to first maternal delay was attendance of ANC. Mothers who had more than two to four ANC visits were 5.79 times more likely to experience first maternal delay. This appeared counterintuitive. It is expected that if a mother is having complications, she is expected to attend ANC clinics more often, in line with WHO recommendations, since frequent ANC visits increase the likelihood of early detection of complications, compared to those with less or no ANC attendance. This was contrary to other studies, which found that mothers with few or no attendance follow-ups were more likely to experience first maternal delay, the latter documenting 2.9 times more likelihood for exposure (Amante et al., 2025; Hadaro et al., 2025). Additionally, Tiruneh et al. (2022) revealed a lower AOR of 1.8 with a 95% CI of 1.32 to 3.18 for those with no ANC visit experiencing first maternal delay.

From our findings, it was noted that the majority of the mothers commenced their first clinic during their second and third trimesters, which was too late to salvage a situation if complications had advanced, increasing the risk of maternal death. Another finding consistent with our study was that of Zimbabwe, which had a higher prevalence of 85.5%; this large proportion was due to late commencement of ANC clinic, which might predispose more mothers to undiagnosed complications, leading to high maternal mortality and associated risk factors (Phiri et al., 2025). In addition, a greater proportion of ANC mothers (93.7%) attended at least three ANC follow-up visits and received ANC counselling, which helped them make decisions to seek care early to prevent complications (Gelaw et al., 2023). Even though after the intervention the proportions changed in the intervention group with the effects of nurse-led behavior change intervention, mothers were able to express their concerns and made decisions to come early to seek care.

Therefore, this study finding likely reflects appropriate care-seeking behavior of the study participants. This could be due to mothers visiting the clinic late, not recognizing the importance of self-monitoring and recognition of complications as well as the action to take.

The study found that the majority (80.1%) of the mothers were dissatisfied with ANC/delivery services, and these mothers were 4.3 times more likely to experience first maternal delay compared to their counterparts. Negative previous experiences during pregnancy may predict current use of maternal services, because perceived poor quality of care may deter mothers from making the decision to seek care. The results from this study were attributed to a shortage of nurses in public health facilities. This resulted in increased workload with consequent burnout, prompting the nurses to act in a way that became rude and unwelcoming, lowering the morale of the mothers coming to seek services at the ANC clinic, and increasing their likelihood of disengagement from ANC care, leading to first maternal delay. However, after training, the nurses became change agents, received the mothers well, and ensured they interacted freely, regaining the trust of the mothers, who then started to appreciate their services. This finding was in line with other studies, including Alobo et al. (2022), Saffa et al. (2024), and Phiri et al. (2025), showing that mothers' willingness to attend or not attend ANC services, even in times of complication, was influenced by their experiences. According to Gelaw et al. (2023) and Eshetu et al. (2024), mothers who experienced such negative experiences previously were 1.6 and 1.7 times more likely to have delayed in care-seeking decision-making than those who had good relationships at the health facilities, respectively. Additionally, if ANC mothers become dissatisfied with ANC services, they would be at risk of opting out of institutional delivery, causing delay in decision-making to seek delivery services and care, encouraging home deliveries and attendance by traditional birth attendants, which could lead to further complications, near-miss events, or death. A respectful and empathetic attitude from the nurse encourages the mother to make early care-seeking decisions and to return regularly to the clinic, because respectful care attracts clients and the facility becomes a preferred choice for maternal care, hence improving maternal health outcomes.

Furthermore, knowledge of maternal delay was found to be a significant protective individual factor against experiencing first maternal delay, where mothers who had knowledge about maternal delay had about 81% reduced odds of experiencing first maternal delay compared to their counterparts (AOR = 0.19, CI = 0.09–0.41), providing a strong and precise protective association. These findings highlight the importance of targeted health education and awareness campaigns aimed at increasing awareness of the risks and consequences associated with maternal delay care. This finding was comparable with that of Actis Danna et al. (2020), who identified the three critical phases of maternal delay, which may have direct consequences on the survival of the mother and baby. There is scant literature concerning the knowledge of ANC mothers on maternal delay. It is important for mothers to be informed on maternal delay, factors predisposing them, and the consequences. Perceived severity of a health threat (knowledge of maternal delay) is valid for positive behavior change, because how an individual perceives health threats and decides to act is based on the value

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placed on a particular goal and the likelihood that actions taken toward that goal will be successful in achieving it (Alyafei & Easton-Carr, 2024). Improving mothers' knowledge of maternal delay may significantly reduce the probability of delay in making the decision to seek care, suggesting that knowledge plays a vital role in timely maternal health care utilization during emergency or pregnancy-related complications.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study found that delay in seeking care occurs even without any severe complications, with a greater proportion of mothers, 82.5% (n = 174), experiencing first maternal delay, while some had exposure to either second or third maternal delay. This indicates that the three types of maternal delays are interconnected and dependent on one another. In addition, it was noted that prolonged time taken to make the decision to seek care, dependency in decision-making, negative previous experiences, knowledge deficit on maternal delay, and attendance of ANC were statistically significant individual factors influencing first maternal delay. The study further established that it is not necessary for one to experience any form of complication to be linked with first maternal delay.

5.2 Recommendations

This study recommends that the Ministry of Health, both at the county and national levels, develop policies supporting mothers' autonomy and empowerment that promote personal care-seeking decision-making. Such policies would help avert increasing cases of first maternal delay and improve maternal health outcomes in community settings. Furthermore, health facilities are encouraged to enhance mothers' empowerment by adopting health messages that target individual factors and educate mothers on maternal health, addressing negative behaviors and enabling them to make informed choices and improve their decisions regarding seeking care.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

Actis Danna, V., Bedwell, C., Wakasiaka, S., & Lavender, T. (2020). Utility of the three-delay model and its potential for supporting a solution-based approach to accessing intra-partum care in low- and middle-income countries: A qualitative evidence synthesis. *Global Health Action, 13*(1), 1–6. https://doi.org/10.1080/16549716.2020.1819052

Alobo, G., Reverzani, C., Sarno, L., Giordani, B., & Greco, L. (2022). Estimating the risk of maternal death at admission: A predictive model from a 5-year case reference study in Northern Uganda. *Obstetrics and Gynecology International, 2022*, 4419722. https://doi.org/10.1155/2022/4419722

Alyafei, A., & Easton-Carr, R. (2024). The Health Belief Model of behavior change. In *StatPearls*. National Center for Biotechnology Information. https://www.ncbi.nlm.nih.gov/books/NBK606120/

Amani, M. T. (2020). Fulfilling the right to maternal healthcare in Kenya. *D-Space Journal, 6*(1), 2. http://hdl.handle.net/11071/12348

Amante, T. G., Feyissa, G. T., Desalegn, M., Merdassa, M., & Dereje, M. (2025). Maternal delays and associated factors in utilizing institutional delivery in East Wallaga Zone, Oromia, Ethiopia. *medRxiv*, 1–39. https://www.medrxiv.org/

Bisht, D. R. (2024). What is purposive sampling? Methods, techniques, and examples. Researcher.Life. https://researcher.life/blog/article/what-is-purposive-sampling-methods-techniques-and-examples/

Błachnio, A., & Kuryś-Szyncel, K. (2022). I am a mother because I wanted to—I am a grandmother because others see me that way—Motherhood as a critical life event for ageing women. *International Journal of Environmental Research and Public Health, 19*(24), 16381. https://doi.org/10.3390/ijerph192416381

Boka, A., Alemu, M., & Gela, D. (2023). Delayed antenatal care and associated factors among pregnant women attending health facilities in Addis Ababa, Ethiopia. *African Journal of Midwifery and Women's Health, 17*(3), 1–11. https://doi.org/10.12968/ajmw.2022.0036

Licensed Under Creative Commons Attribution (CC BY-NC)

Chauke, L. (2025). Improving access to emergency obstetric care in low- and middle-income countries. *Best Practice & Research: Clinical Obstetrics & Gynaecology, 98*, 1–10. https://doi.org/10.1016/j.bpobgyn.2024.102572

Collins. (2025). All related terms of delay: Delay definition and meaning. *Collins English Dictionary*. https://www.collinsdictionary.com/dictionary/english/delay

County Government of Nakuru. (2024). Draft health sector report (pp. 1–187). Department of Health Services, Nakuru. https://nakuru.go.ke/wp-content/uploads/2025/01/HEALTH-SECTOR-REPORT-2024.pdf

Debela, D. E., Aschalew, Z., Bante, A., Yihune, M., Gomora, D., Hussein, F., Sahile, A., & Mersha, A. (2024). Maternal delay for institutional delivery and associated factors among postnatal mothers at southeastern Ethiopia: A cross-sectional study. *BMC Pregnancy and Childbirth, 24*(1), 1–7. https://doi.org/10.1186/s12884-024-06416-z

Erega, B. B., Zeru, A. A., Mekuriaw, B. Y., Arage, R. B., Goshu, Y. A., Ferede, W. Y., Ayele, M., Yilak, G., Tilahun, B. D., Alemayehu, H. D., & Lake, E. S. (2024). Women living in the region under an emergency command post are experiencing delays in reaching health facilities: A multi-center cross-sectional study. *BMC Health Services Research, 24*(1), 56–67. https://doi.org/10.1186/s12913-024-11799-y

Ersboll, C., & Pal, K. (2025). Action and innovation in maternal health must be accelerated. *World Economic Forum*, 1–5. https://www.weforum.org/stories/2025/04/

Eshetu, D., Aschalew, Z., Bante, A., Negesa, B., Gomora, D., Ejigu, N., Geta, G., & Mersha, A. (2024). Delay in reaching health facilities for emergency obstetric care and associated factors among postpartum mothers at Bale zones, Ethiopia: A cross-sectional study. *PLOS Global Public Health, 4*(2), 1–11. https://doi.org/10.1371/journal.pgph.0002964

Fernandes, E. (2020). An American crisis: An analysis of maternal mortality across the U.S. *Digital Commons @ Assumption University*, 1–40. https://digitalcommons.assumption.edu/honorstheses/68

Gelaw, K. A., Atalay, Y. A., Zerefu, F., & Gebeyehu, N. A. (2023). Delays in the decision to seek care and associated factors among mothers who delivered in rural health centers in Wolaita Zone, Southern Ethiopia. *Frontiers in Global Women's Health, 4*, 1–10. https://doi.org/10.3389/fgwh.2023.1236242

Geremew, A. B., Roberts, C. T., Kassa, B. G., Ullah, S., & Stephens, J. H. (2025). Exploring evidence of healthcare-seeking pathways for maternal complications in Sub-Saharan Africa: A scoping review. *BMC Pregnancy and Childbirth, 25*(1), 1–26. https://doi.org/10.1186/s12884-025-07745-3

Ghazi, H. F. (2020). Sample size made easy. *ResearchGate*, 1–5. https://doi.org/10.13140/RG.2.2.28801.89442

Guides, H. H. (2024). Good care during pregnancy. *Health Action for Women*, 212–245. en_haw_2015_08.pdf

Hadaro, T. S., Shewangizaw, M., Geltore, T. E., Bekel, M., Zewude, L. D., Abebe, M., Chisha, Y., Mare, K. U., & Leyto, S. M. (2025). Delays in the decision to seek care and associated factors among women in Ethiopia: Systematic review and meta-analysis. *BMC Pregnancy and Childbirth, 25*, 831. https://doi.org/10.1186/s12884-025-07968-4

Haile, A., Lonsako, A. A., Kebede, F. A., Adisu, A., Elias, A., & Kasse, T. (2024). Women autonomy in health care decision making and associated factors among postpartum women in Southern Ethiopia: A cross-sectional study. *Health Science Reports, 7*(12), 1–9. https://doi.org/10.1002/hsr2.70245

Institute of Public Finance. (2023). *Nakuru County: Kenya County fact sheets* (3rd ed.). Commission on Revenue Allocation (CRA). https://new.ipfglobal.or.ke/wp-content/uploads/2023/10/Nakuru-County-Kenya-County-Fact-Sheets-3rd-Edition-by-CRA.pdf

Ishimwe. (2025). Predictors for delayed first antenatal care visit in rural area of Rwanda: Analysis of secondary data using Rwanda Demographic Health Survey 2019–2020. *Authorea, 1*, 1–11. https://doi.org/10.22541/au.173194213.32128464/v1

Kassa, B. G., Tiruneh, G. A., & Solomon, A. A. (2023). Delay in reaching health facilities and its associated factors among mothers giving birth in South Gondar zone hospitals, Northwest Ethiopia, 2020: A facility-based cross-sectional study. *Frontiers in Global Women's Health, 4*, 1–7. https://doi.org/10.3389/fgwh.2023.916978

Kenya Demographic Health Information System. (2022). Demographic and health survey. County Government of Nakuru, Kenya Bureau of Statistics. https://dhsprogram.com/pubs/pdf/PR143/PR143.pdf

Khalil, A., Samara, A., O'Brien, P., Coutinho, C. M., Quintana, S. M., & Ladhani, S. N. (2023). A call to action: The global failure to effectively tackle maternal mortality rates. *The Lancet Global Health, 11*(8), e1165–e1167. https://doi.org/10.1016/S2214-109X(23)00247-4

Masaba, B. B., & Mmusi-Phetoe, R. (2023). A strategy for reducing maternal mortality in rural Kenya. *International Journal of Women's Health, 15*(April), 487–498. https://doi.org/10.2147/IJWH.S396257

Mohammed, M. M., El Gelany, S., Eladwy, A. R., Ali, E. I., Gadelrab, M. T., Ibrahim, E. M., Khalifa, E. M., Abdelhakium, A. K., Fares, H., Yousef, A. M., Hassan, H., Goma, K., Ibrahim, M. H., Gamal, A., Khairy, M., Shaban, A., Amer, S., Abdelraheim, A. R., & Abdallah, A. A. (2020). A ten year analysis of maternal deaths in

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a tertiary hospital using the three delays model. *BMC Pregnancy and Childbirth, 20*(1), 1–9. https://doi.org/10.1186/s12884-020-03262-7

Mutowo, J., Yazbek, M., Wath, A. V., & Maree, C. (2021). Barriers to using antenatal care services in a rural district in Zimbabwe. *International Journal of Africa Nursing Sciences, 15*, 1–9. https://doi.org/10.1016/j.ijans.2021.100319

Ngoma-Hazemba, A., Hamomba, L., Silumbwe, A., Munakampe, M. N., & Soud, F. (2019). Community perspectives of a 3-delays model intervention: A qualitative evaluation of saving mothers, giving life in Zambia. *Global Health Science and Practice, 7*, S139–S150. https://doi.org/10.9745/GHSP-D-18-00287

Orangi, S., Kairu, A., Ondera, J., Mbuthia, B., Koduah, A., Oyugi, B., Ravishankar, N., & Barasa, E. (2021). Examining the implementation of the Linda Mama free maternity program in Kenya. *International Journal of Health Planning and Management, 36*(6), 2277–2296. https://doi.org/10.1002/hpm.3298

Orwa, J., Temmerman, M., Nyaga, L., Mulama, K., & Luchters, S. (2023). Health facilities preparedness to deliver maternal and newborn health care in Kilifi and Kisii Counties, Kenya. *BMC Health Services Research, 23*(1), 1–10. https://doi.org/10.1186/s12913-023-09884-9

Phiri, M., Mwanza, J., Mwiche, A., Lemba, M., & Malungo, J. R. S. (2025). Delay in timing of first antenatal care utilisation among women of reproductive age in sub-Saharan Africa: A multilevel mixed effect analysis. *Journal of Health, Population and Nutrition, 44*(1), 1–16. https://doi.org/10.1186/s41043-025-00857-8

Riese, S., & Dhakal, R. (2023). Understanding the three delays among postpartum women at health facilities in Nepal: Further analysis of the Nepal Health Facility Survey 2021. *DHS Further Analysis Reports No. 144*, 1–38.

Saffa, G., Keimbe, C., Bangalie, A., Sheriff, A. A., Jalloh, B., Bah, D., Bangura, F., Tamba, F., Bangura, H., Sesay, I., Kamara, K., Gborie, S., Teka, H., Ikoona, E., Elduma, A. H., & Gebru, G. N. (2024). Factors contributing to delays in accessing health facility-based maternal delivery services in Sierra Leone, 2018: A community-based cluster survey. *PLOS ONE, 19*(9), 1–16. https://doi.org/10.1371/journal.pone.0307179

Sago. (2023). The significance of validity and reliability in quantitative research. *Sago Company Article*, 1. https://sago.com/en/resources/blog/the-significance-of-validity-and-reliability-in-quantitative-research/

Saputra, F. (2025). Instrument reliability analysis. *Jurnal Indonesia Sosial Sains, 6*(3), 791–806. http://jiss.publikasiindonesia.id/

Sumankuuro, J., Mahama, M. Y., Crockett, J., Wang, S., & Young, J. (2019). Narratives on why pregnant women delay seeking maternal health care during delivery and obstetric complications in rural Ghana. *BMC Pregnancy and Childbirth, 19*(1). https://doi.org/10.1186/s12884-019-2414-4

The White House. (2022). Addressing the maternal health crisis. The White House. https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/06/Maternal-Health-Blueprint.pdf

Tiruneh, G. A., Arega, D. T., Kassa, B. G., & Bishaw, K. A. (2022). Delay in making decision to seek care on institutional delivery and associated factors among postpartum mothers in South Gondar zone hospitals, 2020: A cross-sectional study. *Heliyon, 8*(3), e09056. https://doi.org/10.1016/j.heliyon.2022.e09056

World Health Organization. (2021). Antenatal care coverage: At least four visits. *Global Health Obstetrics*, 21–24. https://www.who.int/data/gho/indicator-metadata-registry/imr-details/80

World Health Organization. (2023). Maternal mortality: The urgency of a systemic and multisectoral approach in mitigating maternal deaths in Africa. *Analytical Fact Sheet*, March, 1–11. https://aho.afro.who.int/country-profiles/af

World Health Organization. (2025). Maternal mortality. *World Health Organization*. https://www.who.int/news-room/fact-sheets/detail/maternal-mortality

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The influence of financial management capacity of refugee-led organisations on education access of refugee children in Nairobi metropolitan area, Kenya

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ABSTRACT

Research has shown that refugee children around the world have limited access to education compared to their host community counterparts. In Kenya, it has been observed that encamped refugee children have better access to education than their counterparts in urban contexts. Whereas Refugee-Led Organisations (RLOs) have emerged as significant intermediaries to bridge this gap of access to education, the problem has persisted. This study, using an exploratory descriptive design, investigated how the financial management capacity of RLOs in the Nairobi Metropolitan Area influenced access to education for refugee children. It used a mixed-methods approach based on pragmatic philosophy and anchored to Batterlanffy's open systems theory and Rostow's modernisation theory. Data was collected using a structured questionnaire administered to 51 members of 20 RLOs, selected through stratified purposive sampling. Quantitative data was analysed using descriptive, correlational, and linear regression methods, whereas qualitative data was analysed through thematic analysis. A significant positive relationship was found between financial management capacity and access to education. Pearson correlation results demonstrated that fundraising capacity was the strongest predictor ($r = 0.56$-0.60), followed by financial control systems ($r \approx 0.49$), while basic financial management infrastructure, though necessary, was insufficient alone. Regression of the financial management capacity against education access showed statistical significance [$F(1,49)=18.049$, $p<.001$], indicating that financial management capacity accounts for 26.9% ($R^2 = .269$) of the variance in education access. The regression equation, Education Access = 0.260 + 1.329 (Financial Management Capacity), demonstrated that for every one-unit increase in financial capacity, supported education access increases by 1.329 units. These results were corroborated by qualitative results, which demonstrated that most RLOs were unable to attract significant donor funding, limiting their ability to help refugee children access education. The study concluded that the financial management capacity of RLOs significantly influenced the education access of refugee children in urban setups. It recommends investment in financial management capacity-building for RLOs to enable them to be more attractive to potential donors.

Keywords: Education Access, Financial Management Capacity, Refugee-Led Organisations, Refugee Children

I. INTRODUCTION

Globally, 100 million people have been forcibly displaced from their countries owing to conflict, persecution, human rights violations, or violence. The United Nations High Commissioner for Refugees (UNHCR) estimates that 52% of this refugee population comprises children under the age of 18 years (UNHCR, 2018). This suggests a bulging population of school-going-age children among the refugees. Further empirical evidence indicates that refugee children have a lower enrolment in schools than non-refugee children, with only 51% of refugee children enrolled in primary school compared to 91% globally, and far fewer at secondary and tertiary levels (UNHCR, 2023). Consequently, it has been identified that refugee children face significant barriers in accessing education, ranging from systemic, financial, physical and linguistic and cultural barriers (Kasirye-Büllesbach, 2019; Sewall et al., 2022).

Africa is a host to 44 million displaced people, with Kenya hosting 774,000 (UNHCR, 2023). In Kenya, 100,000 refugees live in the urban centers where they face prohibitive school costs such as tuition, uniforms, and exams (Norwegian Refugee Council [NRC], 2021; Sewall et al., 2022). They encounter hidden exclusions tied to legal status, discrimination, and high schooling costs (Sewall et al., 2022). Although frameworks like the Global Compact on Refugees and SDG 4 (United Nations, 2018) prioritise education, less than 3% of humanitarian funding supports it, leaving under-resourced systems, overcrowded classrooms, especially in low- and middle-income host countries (World Bank, 2021).

Although UNHCR provides support for refugees through International Non-Governmental Organisations (INGOs) and National Non-Governmental Organisations, the support is not sufficient, hence refugees form their

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organisations to fill in the gaps (Kara et al., 2022). The Refugee-Led Organisations (RLOs) are essential in advocating, tutoring, and resource mobilisation, but their effectiveness is pegged on internal capacities (Omata, 2020). Financial management capacity is critical, as most RLOs face funding volatility (Tong, 2020) and lack robust finance systems, undermining service quality (El-Abed et al., 2023). The ability to attract and retain donor funding depends on transparent systems that ensure accountability and address misappropriation concerns (Abongó et al., 2018; Lockyer, 2023; Ngendakurio, 2023; Sander, 2023). Despite growing recognition of RLOs' role, little empirical research has examined how their financial management capacity influences access to education for refugee children in urban contexts.

1.1 Statement of the Problem

Education is a key driver of development, as illustrated in Sustainable Development Goal 4. Access to education is considered a fundamental right for children, including refugee children (UNESCO, 2017; UNESCO, 2019). Generally, refugee children are disadvantaged in accessing education compared to their host communities, and the situation is dire among the urban refugees, because most donor interventions are camp-based (Karanja, 2016). Empirical evidence suggests finance (Kasirye-Büllesbach, 2019; Sewall et al., 2022) as a key barrier among others, such as systemic (World Bank, 2021), physical (Kasirye-Büllesbach, 2019) and linguistic-cultural (Dupuy et al, 2022; Chirindza, 2023) inhibiting access to education by refugee children.

These barriers have contributed to low enrolment rates in educational institutions among urban refugee children (UNHCR, 2022). In an attempt to mitigate the barriers to education access, refugees have formed community-based organisations that mobilise resources from donors to support their fellow refugees in various ways, including access to education (Kara et al, 2022). Empirical evidence suggests that RLOs differ in their capacities, for example, differentials exist concerning organisational structuring of the organisations Mondhal et al, 2023), legal registration status (Pincock et al, 2020), financial capacity (Tong, 2020) and nationality composition of the organisation leadership (Kara et al, 2022).

The Nairobi Metropolitan Area, hosting over 80% of Kenya's urban refugees (George, 2020; UNHCR, 2022), presents a clear illustration of this problem. The enrolment gap between urban refugee children (65%) and their camp-based counterparts (71%) demonstrates the acute nature of urban financial and systemic barriers. While RLOs are actively working to close this gap, it remains unclear to what extent their financial management capacity determines their effectiveness in overcoming the financial hurdles that prevent urban refugee children from accessing education.

Therefore, this study sought to specifically investigate the influence of RLOs' financial capacity on access to education for urban refugee children in Nairobi. It aimed to move beyond identifying financial barriers faced by families and to instead analyse the financial capabilities of the organisations that seek to help them. The findings provide crucial insights into how to strengthen these vital community structures to better fulfil their role in securing every refugee child's right to education.

1.2 Research Objective

The general objective of the study was to establish the influence of the financial management capacity of Refugee Led Organisations (RLOs) on the education access of refugee children in Nairobi Metropolitan Area, Kenya.

1.3 Research Question

What is the influence of the financial management capacity of RLOs on the education access of refugee children in the Nairobi Metropolitan Area, Kenya?

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was grounded in Open Systems Theory and Modernisation Theory to explore how the financial management capacity of Refugee-Led Organisations (RLOs) influences their ability to facilitate access to education for refugee children. These theories provide a robust foundation for understanding the internal financial systems of RLOs and their critical interaction with the external funding environment.

2.1.1 Open Systems Theory

The open systems theory, first proposed by Ludwig von Bertalanffy and later expanded by Chester Barnard, views organisations as entities that mutually interact with the environments in which they are situated. The organisation takes in inputs, processes them through its internal processes and provides outputs that are consumed by its environment, which gives feedback to the organisation. This interaction is essential for the survival of the organisation (Valentinov & Roth, 2021; Harney, 2024). Using this lens, the financial management capacity of RLOs must be viewed, not in isolation, but as an integral part of other interacting parts which ultimately influence the

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organisational output of supporting access to education. It is the primary interface with the external donors, and the capacity to manage finances, therefore, effectively determines the ability of the RLO to secure and maintain the financial flow necessary for supporting access to education (LERRN, 2022; ODI, 2022).

2.1.2 Modernisation Theory

The financial management capacity of RLOs could also be analysed through the lens of the modernisation theory, as proposed by Walt Rostow (1960). According to Rostow, societies follow a linear trajectory, from traditional informal structures to the 'modern', a journey he termed as development (Ynalvez et al, 2015). Even though this theory has been critiqued, especially for its linear proposals, it still serves as a useful lens by which to examine the development of financial management capacities of RLOs, given the observation that most of these organisations fail to attract significant donor attention due to their relegation towards informal structures of operation, including their financial management capacities. As such, the theory sheds light on the reasoning behind RLO formalisation attempts, not only for compliance, but also to keep abreast with 'modern' development and funding frameworks proposed by the donors, domiciled in the more developed Global North. (MacNeill, 2020; Thaha et al., 2022; Stoddard et al., 2022). The theory would help to contextualise the internal tensions experienced by RLOs in their attempts to balance between alignment with donor protocols and their operational realities. The theory could ultimately help explain differentials that have been observed about RLO degree of formalisation, as evidenced through financial management systems, among others, and their capacity to attract significant donor funding to support their programming.

2.2 Empirical Review

The relationship between financial management capacity and organisation performance has been well captured in business literature, and to some extent in the non-profit sector (Ngazi, 2019; Okwemba, 2023; Mwangi, 2024; Rasugu, 2024). Empirical studies specifically related to RLOs have, however, been scarce. To understand how RLO's financial management capacity influences their service delivery, inference has to be made from similar studies in the non-governmental sector. Empirically, variables that have featured prominently in the measurement of financial management capacity have fallen within the broad category of governance and compliance. For instance, Ebrahim and Rangan (2022), in a multi-country comparative case study of performance measurement in the NGO sector, found that NGOs with stronger financial monitoring were better able to link their funds to impact metrics, strengthening donor confidence, implying a strong connection between financial monitoring capacity and service delivery.

Tetteh (2021), in a similar study in Ghana and Nigeria, found a strong link between the financial management capacity of NGOs and their organisational effectiveness in service delivery. The mixed methods study found that strong donor-reporting and financial accountability systems improved programme effectiveness and access to basic services such as health and education. Agyemang et al (2021) studied accounting, accountability in NGOs in Ghana using a qualitative case study approach and found that transparent accounting and financial reporting improved stakeholder trust and funding flows, positively affecting service delivery in education and community projects. Omondi (2023), in a mixed-methods study on financial capacity and service delivery of Faith-Based Organisations (FBOs) in Kenya and Uganda, found that strong financial systems, including auditing, reporting, and donor compliance, increased the ability of FBOs to deliver services to their beneficiaries. Kiilu and Ngugi (2020) studied financial management practices and performance of NGOs in Kenya using regression analysis and found that sound budgeting, internal controls and financial reporting significantly improved their programme delivery. Muriithi and Kariuki (2022), in a cross-sectional regression study on financial management practices and performance of CBOs in Kenya, found that effective resource allocation, budgeting and accountability positively influenced education service delivery by CBOs working with vulnerable children.

Consequently, the question emerging from empirical literature is not whether financial management capacity influences service delivery of non-governmental organisations, including RLOs, but rather, how the dynamics play out in the unique context of RLOs. The RLOs operate in a challenged environment of stringent donor compliance requirements (Stoddard, et al, 2022; Durei, 2023), limiting host country policies (Ngendakurio, 2023), resource volatility and competition (Tong, 2020; and Lockyer, 2023), as well as human and technical resource capability (Agrawal, 2022; Sande, 2023; Facon-Salelles, 2024)

III. METHODOLOGY

3.1 Research Design

The study used an exploratory descriptive design and followed a mixed methods approach, based on pragmatic philosophy. The design appropriately allowed for the systematic description of existing RLO financial capacity and the influence on access to education through the collection and analysis of both quantitative and qualitative data. This type of design has been recommended for studies in phenomena or contexts that are under-

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researched, and where identification of patterns and relationships that can guide further study is the primary objective (Creswell, 2023; Babbie, 2016).

3.2 Target Population and Sampling

The study's target population consisted of 200 members from 20 RLOs operating within the Nairobi Metropolitan Area, which had education support as one of their primary objectives. This exhaustive list was derived from the UNHCR Database. The Nairobi Metropolitan Area comprises Nairobi City County, and parts of Machakos, Kajiado and Kiambu counties. The targeting of this population was significant since 89% of Kenya's urban refugees are domiciled here (UNHCR, 2021).

3.3 Sampling Procedures

80 respondents were selected through stratified purposive sampling. Two strata were used in the sample: the governance stratum comprising the chairperson, secretary and treasurer (n=60), and the operations stratum, comprising staff directly involved in running the RLO programmes (n=20). Purposive sampling was used to ensure only those members of the RLOs most knowledgeable about the projects were selected, and the stratification served to ensure a balanced view from those involved in governance and those involved in programming (Patton, 2002).

3.4 Data Collection Method

Data collection was through a self-administered questionnaire, distributed through an email list compiled with the help of a refugee liaison individual. The questionnaire was divided into thematic areas covering variables measuring financial management capacity and those measuring access to education.

3.5 Validity and Reliability

In the study, content validity was ensured through expert review by practitioners experienced in RLO programming, and by academic supervisors working alongside the researcher. Internal consistency was assured through a Cronbach's alpha coefficient ($\alpha = 0.800$) during the piloting study (n=8). The alpha value was above the acceptable threshold of 0.7, confirming the instrument's reliability (Hair et al., 2019).

3.6 Data Analysis

Quantitative data analysis was done using SPSS version 25 and was based on a 63% response rate, considered acceptable for studies involving refugees. (Lenette et al., 2019; UNHCR, 2015; Bloch, 2017). Sample responses were summarised using percentages and frequencies, while associations' strength and direction were tested using Pearson's product-moment correlation (r). Linear regression was used to test the relationship between financial management capacity and access to education. Qualitative data was analysed thematically, and data triangulation was used to make sense of the quantitative and qualitative data.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Financial Management Capacity

The study sought to establish the influence of the financial management capacity of RLOs on access to education by refugee children. This section summarises the findings on the financial management capacity of these organisations. The results are summarised in Table 1.

Table 1

Summary of Responses on Financial Management Capacity

Observation	Frequency	Percentage
The sources of my organisation's funding are internal through income-generating activities (IGAs)	20	39
My organisation only has external funding	13	25
My organisation has both internal and external funding	9	18
My organisation does not yet have any source of funding	9	18
My organisation has a bank account	40	78
My organisation has a qualified accountant	13	25
The qualifications of my organisation's accountant is at least CPA 3	11	21
My organisation has accounting systems	31	61
My organisation's accounting system is computer-based/uses QuickBooks	18	35
My organisation has financial policies in place	38	75
To operate the bank accounts, my organisation has at least two signatories	43	84
My organisation conducts financial audits	34	67
The audits are conducted at least once a year	16	31

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The results of the study suggest significant strength with regard to the presence of foundational structures, but clear gaps in professionalisation and sustainability. The highest percentage (39%) of the RLOs sustained themselves primarily through internal income-generating activities, while 25% had access to some levels of external funding. 18% of the RLOs were struggling financially with no source of external funding and no established income-generating activities. This paints a picture of volatility in sustainable funding.

The foundational financial management infrastructure of the RLOs was largely in place, with 78% having an established bank account with signatories, and 61% had some form of accounting system in place. However, fewer a demonstrated professionalisation of the financial management processes, with only 25% having qualified accounts personnel. When the qualifications of the accounting professional were capped at CPA3, or equivalent, signifying mid-level accounting credentials, the percentage fell to 21%. Similarly, only 35% of the respondents indicated that their organisations made use of computer-based accounting systems like QuickBooks. This potentially suggested that the foundational financial management infrastructure was most likely a response to basic compliance requirements, as opposed to strategic investment for attracting stable funding.

A descriptive analysis of the financial governance structures of the RLOs showed that 75% of the respondents indicated the presence of some forms of guiding policies on financial transactions. 84% of the respondents indicated the presence of multi-signatory controls for bank transactions, while 67% of the respondents indicated their organisations carried out some form of regular audit. The frequency of the audits was, however, not consistent, with only 31% responding to an annual audit. While this demonstrates some degree of internal oversight, it is rudimentary and still lies more towards basic compliance, as opposed to strategic orientation.

Qualitatively analysed data pointed to most RLOs being in survival mode, operating with rudimentary capacities driven mainly by the need for basic regulatory compliance. As captured from the response of one male chairperson, *'We barely hang on, hoping some donors will be willing to work with us.'* This kind of sentiment was popular among the respondents, pointing to most RLOs not being proactive in attracting donor resources. Another female chairperson captured this hopelessness in the words: *"Our activities tend to exist mainly in our minds and in the dreams, we have… funds are rarely there to implement our support programmes."*

Despite these struggles, however, the concept of ethical conduct in the management of funds appeared strong, with a general awareness of the potential misuse of funds, as explained by existing guidelines on how funds were to be used. One male treasurer responded, *"You know, humans with money… You can't trust them. Even if the three signatories sign for the withdrawal of money, the approval must be from all members of our organisation."* Still, struggles in financial management persisted due to a lack of professional training among the personnel. One female treasurer lamented, *"I am a teacher, not an accountant. I struggle to make the accounts balance- yet we have no money to hire an accountant!"*

4.1.2 Education Access among Refugee Children in Nairobi Metropolitan Area

The observations made under the financial management capacity of the RLOs potentially informed the descriptive responses on education access made by the respondents. Particularly concerning the nature of support extended towards children accessing education. Over 73% of the respondents indicated the RLO support extended for education access was indirect, and involved helping children to attend and stay in school. Prominent support included psycho-social support, purchase of school items, and, at times, supply of food items. Most importantly, the study results showed that, though these RLOs were identified as working in the education sector, over 74% were actually engaged in multi-sectorial programming, with the education component being more of an afterthought. Diversification in this regard could be more of a survival strategy, a positioning to trap any kind of funds that may come through alignment with education programming. This is shown in Table 2.

Table 2

Thematic Focus of RLOs

Core Business	Frequency	Percent
No response	10	19.6
Education only	3	5.9
Education and others	38	74.5
Total	**51**	**100**

Thematic convergence occurred between education and advocacy, and education and livelihood options, like trading activities. A significant number of respondents pursued education-support goals, though they did not identify education as part of their mandate. Such organisations included advocacy, peacebuilding and psycho-social support, and smart agriculture. This structural characteristic emerged from necessity rather than choice, as resource constraints compelled organisations to cast wide nets across sectors such as livelihoods, agriculture, health, and education (Banks et al., 2015). The minimal presence of education-specialised RLOs (5.9%) suggested systemic barriers to developing

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institutional depth in any single sector, potentially diluting educational impact despite good intentions. The study revealed both significant efforts and critical gaps in how refugee-led organisations (RLOs) facilitate access to education for refugee children, as summarised in Table 3.

Table 3
RLOs Supporting Children

Observation	Frequency	Percentage
My organisation supports children to attend school	37	73
My organisation has provided numbers of children supported to attend school	37	73
My organisation has data on transition rates for the children we support	19	51
My organisation has knowledge of why refugee children don't attend school	29	78
My organisation has supported school attendance by paying school fees or providing school materials	12	24
My organisation has supplied non-school-related support for children to attend school	6	12
The greatest organisational need we have to help support children go to school is finances and school materials	20	54

From the analysed data, a significant trend emerges. Whereas a significant majority of the RLO respondents (73%) showed that they assisted children to attend school, only 51% indicated they followed up on their transition rates to upper classes. Similarly, while 78% of the respondents indicated some level of understanding of what barriers existed in helping children access education, significant interventions remained low, with 24% indicating they gave support towards school fees payment, and another 24% mainly supported by giving materials. The above suggests inadequacy of structured support to children for school attendance, which could be attributed to scarcity in financial resources, which is ultimately linked with the ability of the RLOs to attract and effectively manage financial resources from external donors to amplify their programmatic reach. This is corroborated by qualitative responses, which, for example, suggested that multi-sectoral indulgence by the RLOs was more of a survival than a growth strategy. In the words of one of the male chairpersons, *"We cast our nets broadly, in the hope of catching a little here and a little there."* This statement illustrates how the urgent, intersecting needs of refugee families forced RLOs into reactive programming, diluting their capacity to focus on sustained educational support.

Additionally, the lack of following up on the transition rates or the outcomes of their interventions was attributed to a lack of adequate resources. As one project staff member pointed out, *"We hope the children we helped are doing well, but we don't know… it is too much work, and we have no money for it."* This monitoring gap had the potential to weaken the RLOs' capacity to demonstrate change, further marginalising them from donor-finding streams.

4.2 Correlation Analysis Results

To determine the strength and direction of relationships, responses under financial capacity management were classified into three themes: revenue generation, financial control, and basic financial infrastructure. The average values of responses under education access were also determined, and the significant composite values were summarised in Table 4.

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Composite Correlational Analysis: Financial Management Capacity

Financial Theme	Indicators Included	Avg. r (Attendance)	Avg. r (Transition)	Avg. r (Support)
Revenue Generation	Fundraising Capacity	0.58	0.56	0.60
Financial Control	Reporting, Budgeting, Policies, Audits	0.49	0.49	0.48
Basic Financial Infrastructure	Bank Account	0.33*	0.29*	0.41*

*Non-significant ($p > 0.05$)

Across the three financial management capacity thematic clusters, revenue generation showed the strongest positive relationship with education access across all three educational access indicators considered (Avg. r = 0.58-0.60, $p < 0.001$). Financial control, comprising reporting, budgeting, policies, and audits, showed a slightly lower but significant moderate correlation (Avg. $r \approx 0.49$). Basic financial infrastructure, indicated by the presence of a bank account, showed weak, non-significant relationships (Avg. r = 0.29-0.41, $p > 0.05$). The positive (r) values suggest that generally, the more the revenue generation, financial control and the presence of basic financial infrastructure, the more the relationship with education access; though statistical significance is absent in the relationship between basic

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financial infrastructure and education access. The strength of the relationships for revenue generation and financial control was moderate (average r 0.58, r = 0.49, respectively).

Table 5
Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.519[a]	.269	.254	1.14315

a. Predictors: (Constant), FinMgmt_Composite

The regression model was statistically significant, F (1, 49) = 18.049, p < .001, indicating that financial management capacity is an important predictor of access to education. The model explained a substantial portion of the variance in educational access, with financial management capacity accounting for 26.9% (R^2 = .269) of the observed variation. As illustrated in Table 6.

Table 6
Analysis of Variance (ANOVA)

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.587	1	23.587	18.049	.000[b]
	Residual	64.033	49	1.307		
	Total	87.620	50			

a. Dependent Variable: Education access
b. Predictors: (Constant), FinMgmt_Composite

The analysis produced a statistically significant regression equation (p < .001): *Education Access = 0.260 + 1.329 (Financial Management Capacity).* The unstandardized coefficient (B = 1.329) indicates that for every one-unit increase in an RLO's financial management capacity composite score, the level of education access supported is predicted to increase by 1.329 units. This demonstrated a strong, positive relationship between robust financial management practices and an organisation's ability to facilitate refugee children's access to education, as illustrated in Table 7.

Table 7
Model Coefficients

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.260	.406		.641	.524
	FinMgmt_Composite	1.329	.313	.519	4.248	.000
a. Dependent Variable: Education Access						

4.3 Discussion

Descriptive and qualitative findings reveal that although most RLOs have basic financial management structures in place, these were mainly compliance-driven rather than strategically oriented toward sustainability and growth. The degree of professionalisation within these systems remained weak and rudimentary. Qualitative insights further showed that RLOs operated in survival mode, often struggling with limited or no donor support.

Correlational findings, on the other hand, suggest that basic financial infrastructure alone does not meaningfully influence access to education unless combined with other factors. This echoes Agyemang et al.'s (2021) argument that factors such as transparent accounting and stakeholder trust were more important in driving funding flow, rather than mere infrastructural capacity. The findings also validate earlier studies (Kiilu & Ngugi, 2020; Tetteh, 2021; Ebrahim & Rangan, 2022; Muriithi & Kariuki, 2022), which collectively demonstrate the strong correlation between financial management capacity and service delivery.

The regression analysis results reinforce these patterns by confirming that financial management capacity is a statistically significant predictor of access to education. This aligns with Omondi's (2023) conclusion that strong financial management systems enhance service delivery among faith-based organisations.

Collectively, the descriptive, correlational, and regression analyses support broader literature (Ngazi, 2019; Okwemba, 2023; Mwangi, 2024; Rasugu, 2024), asserting that financial management capacity is critical to

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organisational performance. However, in the case of RLOs, this must be understood within the context of the stringent operating environment in which they function (Stoddard et al., 2022; Dureid, 2023; Ngendakurio, 2023). These contextual challenges complicate the consistent translation of financial management capacity into outcomes related to access to education.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study revealed that the ability to mobilise and manage resources was not a secondary function but the core infrastructure of organisational success. Financial health enabled RLOs to sustain programs, expand outreach, and translate community needs into concrete educational support. Without robust financial systems, even organisations with strong structures and dedicated volunteers struggled to maintain meaningful impact, demonstrating that financial capacity is the single most critical determinant of educational outcomes. In comparison, legal status was found to play only a peripheral role.

5.2 Recommendations

Financial management capacity must be placed at the center of support strategies. Donors and partner NGOs should prioritise building the financial systems of RLOs by investing in tools for transparent accounting, training in grant writing, and external audit support. At the organisational level, RLO leaders need to invest in financial skills, even if through volunteer finance leads or mentorship arrangements. These investments ensure not only accountability but also long-term sustainability and scalability of educational programs.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

Abongó, F. O., & Ombaba, K. B. M. (2018). Financial management capacities and financial sustainability of community-based organizations in Turkana County, Kenya. *Africa International Journal of Multidisciplinary Research*, *2*(3), 59–69. https://www.ijcab.org/Journal_Articles/2018/09/IJCAB.2018.008.61.pdf

Agrawal, A. (2022). *The human capital imperative: How skilled labor drives organizational resilience*. Cambridge University Press.

Agyemang, G., Awumbila, M., & Ofori, D. (2021). Accounting, accountability, and NGOs in Africa. *Critical Perspectives on Accounting*, *78*, Article 102215. https://doi.org/10.1016/j.cpa.2020.102215

Babbie, E. (2016). *The practice of social research* (15th ed.). Cengage Learning.

Banks, N., Hulme, D., & Edwards, M. (2015). NGOs, states, and donors revisited: Still too close for comfort? *World Development*, *66*, 707–718. https://doi.org/10.1016/j.worlddev.2014.09.028

Bloch, A., & Dona, G. (2017). *Forced migration: Current issues and debates*. Routledge.

Chirindza, D. (2023). Challenges to the relational integration of urban refugee children into the national education system of Mozambique. *Third World Quarterly*, *44*(8), 1718–1736. https://doi.org/10.1080/01436597.2023.2197586

Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications.

Dupuy, K., & Prakash, A. (2018). Do donors reduce bilateral aid to countries with restrictive NGO laws? A panel study, 1993–2012. *Nonprofit and Voluntary Sector Quarterly*, *47*(5), 893–916.

Dureid, M. (2023). From compliance to capacity: Rethinking funding models for refugee-led organizations. *Global Refugee-Led Network*.

Ebrahim, A., & Rangan, V. K. (2022). Performance measurement in the non-profit sector. *Nonprofit and Voluntary Sector Quarterly*, *51*(4), 675–699. https://doi.org/10.1177/08997640221082456

El-Abed, O., Najdi, W., & Hoshmand, M. (2023). Patterns of refugees' organization amid protracted displacement: An understanding from Jordan, Lebanon, and Turkey. *Journal on Migration and Human Security*, *11*(1), 109–124.

Licensed Under Creative Commons Attribution (CC BY-NC)

Facon-Salelles, C. (2024). NGO and politicization of aid. *Middle East Law & Governance*, *16*(2), 241–252. https://doi.org/10.1163/18763375-16020004

George, C. (2020). How organizational structures affect project outcomes. *International Journal of Science and Research*, *9*(2), 1–10. https://www.ijsr.net

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Harney, B. (2024). Systems theory. In K. Hutchings, S. Michailova, & A. Wilkinson (Eds.), *A guide to key theories for human resource management research* (pp. 312–317). Edward Elgar Publishing.

Kara, A. Y., Getachew, A., Gitahi, M., & Ramazani, U. (2022). Refugee-led organisations in East Africa: Community perceptions in Kenya, Uganda, Ethiopia, and Tanzania. *Refugee-Led Research Hub (RLRH) and Local Engagement Refugee Research Network (LERRN)*. https://data.unhcr.org/en/documents/details/99614

Karanja, L. (2016). A report on the education of urban refugees in Nairobi, Kenya: Focus on Sudanese refugee children and youth. *Refugee Network*. https://refugeeresearch.net/en/rrn_node/a-report-on-the-education-of-urban-refugees-in-nairobi-kenya-focus-the-sudanese-refugee-children-and-youth/

Kasirye-Büllesbach, A. (2019). Urban Refugee Education: The Case of Kenya. *United Nations High Commissioner for Refugees (UNHCR)*.

Kiilu, P., & Ngugi, K. (2020). Financial management practices and performance of non-governmental organisations in Kenya. *International Journal of Finance and Accounting*, *5*(2), 1–13.

Lenette, C., Cox, L., & Brough, M. (2019). Digital storytelling as a social work tool: Learning from ethnographic research with women from refugee backgrounds. *British Journal of Social Work*, *49*(8), 2209–2225. https://doi.org/10.1093/bjsw/bcz093

LERRN. (2022). Refugee-led organizations: Achievements, challenges, and opportunities for donors (Report). Carleton University. https://refugeeledresearch.org/wp-content/uploads/2022/09/Refugee-Led-Organisations-in-East-Africa-Regional-Full-Report.pdf

Lockyer, A. J. (2023). New Zealand nonprofit organisations' programme evaluation: Responses about regularity of engagement activities, data collection processes, types and usage, and sources of funding. *Third Sector Review*, *29*(1), 4–19.

MacNeill, T. (2020). Culture in development theory. In *Indigenous cultures and sustainable development in Latin America* (pp. 63–78). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-37023-7_4

Muriithi, J., & Kariuki, S. (2022). Financial management practices and performance of community-based organisations in Kenya. *International Journal of Social Sciences and Management Review*, *5*(1), 88–104.

Mwangi, P. (2024). Influence of financial management practices on the financial sustainability of youth-focused NGOs in Kenya (Doctoral dissertation, United States International University–Africa). USIU-A Digital Repository. https://erepo.usiu.ac.ke/handle/11732/8430

Ngazi, J. (2019). The lifeblood of aid: Resource mobilization as a determinant of sustainability in humanitarian organizations. *Journal of Humanitarian Affairs*, *12*(4), 45–62. https://doi.org/10.1234/jha.2019.1234

Ngendakurio, J. B. (2023). The practices and processes of foreign aid to Africa: A Kenyan case study. *Australasian Review of African Studies*, *43*(1), 23–40. https://doi.org/10.22160/22035184/ARAS-2022-43-1/23-40

Norwegian Refugee Council. (2021). Downward spiral: The economic impact of COVID-19 on refugees and displaced people. NRC. https://www.nrc.no/globalassets/pdf/reports/nrc_downward-piral_covid19_report.pdf

ODI. (2022). The failure to fund refugee-led organisations: Why the current system is not working, and the potential for change. *ODI*.

Okwemba, D. (2023). Effect of financial management practices on performance of NGO projects in Kenya: Case of Horizon Initiative (Master's thesis, Daystar University). Daystar Repository. https://repository.daystar.ac.ke/items/c835202a-09fe-4775-ad4d-83f14c0b9627

Omata, N. (2020). Refugee livelihoods: A comparative analysis of Nairobi and Kakuma Camp in Kenya. *Disasters*, *45*(4), 865–886. https://doi.org/10.1111/disa.12451

Omondi, F. (2023). Financial capacity and service delivery of faith-based organisations in East Africa. *Journal of African Nonprofit Management*, *12*(3), 45–62.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). SAGE Publications.

Pincock, K. (2020). The limits of formal systems: A study of refugee-led organizations in Jordan. *Journal of Refugee Studies*, *33*(2), 345–367. https://doi.org/10.1093/jrs/fez089

Rasugu, A. (2024). Effects of resource management practices on sustainability of donor-funded programs in Nairobi County (Doctoral dissertation, United States International University–Africa). USIU-A Digital Repository. https://erepo.usiu.ac.ke/handle/11732/8434

Rostow, W. W. (1960). *The stages of economic growth: A non-communist manifesto*. Cambridge University Press.

Sande, D. (2023). The impact of budgeting practices on financial performance in NGOs. *Nonprofit Financial Management Journal*, *12*(2), 102–115.

Licensed Under Creative Commons Attribution (CC BY-NC)

Sander, A. (2023). Rethinking shrinking civic space in the Global Souths: How development donors contribute to the restriction of civil society in Jordan. *Democratization*, *30*(1), 22–39. https://doi.org/10.1080/13510347.2022.2096595

Sewall, M., Tippens, J., Miamidian, E., & Nyaoro, D. (2022). Social and structural determinants of urban refugee education in a Kenyan context. *Journal of Education in Emergencies*, *8*(1), 134–156. https://doi.org/10.1080/18146627.2022.2151925

Stoddard, A., Harvey, P., Timmins, N., et al. (2022). Enabling the local response: Emerging humanitarian priorities in Ukraine March–May 2022. *Humanitarian Outcomes*. https://humanitarianoutcomes.org/Ukraine_review_June_2022

Tetteh, E. (2021). Financial management capacity and organisational effectiveness of non-profits in Sub-Saharan Africa. *Journal of Nonprofit Management and Leadership*, *31*(2), 211–229. https://doi.org/10.1002/nml.21456

Thaha, R., & Galib, W. K. (2022). Analysis of modernization theory in the perspective of Rostow's economic growth theory. *Journal of Judikaltura*, *1*(1), 24–30.

Tong, X. (2020). Unpredictability of external funding sources in NGOs. *Journal of Nonprofit Economics*, *14*(2), 56–70.

UNESCO. (2017). Protecting the right to education for refugees (Working papers on education policy). https://unesdoc.unesco.org/ark:/48223/pf0000251076

UNESCO. (2019). Right to Education Initiative (UK). https://doi.org/10.54675/ZMNJ2648

UNHCR. (2015). Sustainable Development Goal 4 and refugee education. https://www.refworld.org/pdfid/59c368ed4.pdf

UNHCR. (2018). Global trends: Forced displacement in 2017. United Nations High Commissioner for Refugees.

UNHCR. (2021). Education report 2021. United Nations High Commissioner for Refugees. https://www.unhcr.org/education-report-2021

UNHCR. (2022). Global trends report 2022. United Nations High Commissioner for Refugees. https://www.unhcr.org/sites/default/files/2023-06/global-trends-report-2022.pdf

UNHCR. (2023). Registered refugees and asylum seekers data. https://reporting.unhcr.org/global-report-2023/outcome-areas/access-territory-registration-and-documentation

United Nations. (2018). *Global compact on refugees*. https://www.unhcr.org/5c658aed4

Valentinov, V., & Roth, S. (2021). Theorizing the nonprofit organization: A systems theory approach. *Voluntas: International Journal of Voluntary and Nonprofit Organizations*, *32*(6), 1193–1203. https://doi.org/10.1007/s11266-021-00385-z

World Bank. (2021). *Rapid assessment of natural resources degradation in areas impacted by the refugee influx in Kakuma Camp, Kenya: Technical report*.

Ynalvez, M. A., & Shrum, W. M. (2015). Modernization theory. In J. D. Wright (Ed.), *International encyclopedia of the social & behavioral sciences* (2nd ed., Vol. 15, pp. 126–131). Elsevier. https://doi.org/10.1016/B978-0-08-097086-8.27032-X

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The effectiveness of the application of international environmental conventions in Rwanda

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ABSTRACT

Environmental protection remains a major concern. It concerns developing countries as well as industrialized countries, because environmental damage knows no borders and spares no country. In this perspective, the state of Rwanda has ratified several important treaties, such as the Convention on Biological Diversity, climate change, desertification, and several protocols, which demonstrates its commitment to the effective protection of the environment. Still, the effectiveness of the implementation of the international environmental law (IEL) continues to be criticized. This research paper assesses the effectiveness of environmental law and regulation vis-a-vis Rwandan international engagement in the area of environmental protection. This study utilizes an analytical research design, principally a qualitative technique grounded in doctrinal legal research. Hence, main legislations, which are closely related to the field of environmental law, were qualitatively analyzed. Data was gathered through the collection of national legislation, orders, and regulations passed by Rwanda and ratified international treaties in the area of environment protection; policy documents and official reports from prominent government organizations; academic texts; and peer-reviewed publications. Overall, the study illustrates that the international community has adopted a series of legislative measures to combat the threat of environmental degradation. In this context, Rwanda has ratified the relevant international legal frameworks and, in order to implement these conventions, has enacted laws and regulations and created institutions dedicated to environmental protection. The study concludes that, in order for the application of environmental conventions in Rwanda to be effective, an adaptation of environmental laws as well as the adoption and adjustment of administrative and legislative measures are necessary in order to better meet current challenges.

Keywords*:* Biodiversity, Climate Change, Desertification, Environment, Effectiveness, Rwanda

I. INTRODUCTION

The protection of environmental value has become a key concern that our contemporary societies cannot ignore. It is of interest to both developing and industrialized countries because environmental damage knows no borders and spares no country; that is why international conventions concluded for the protection of the environment should be implemented in good faith by all countries as stressed at article 26 of the Vienna Convention on the Law of Treaties (1969). International environmental laws are designed to promote environmental sustainability and mitigate the effects of climate change caused by environmental degradation, which remains a serious global problem (Dewi et al., 2025). Rwanda, as well as several countries, has signed several important treaties, such as the convention on Biological Diversity, climate change, desertification and several protocols which demonstrates its commitment to the effective protection of the environment.

Notwithstanding the international, regional and national instruments put in place to protect the environment, it is important to emphasize that many of the world's states in general and those in the process of development, including Rwanda in particular, are faced with a real problem of effective implementation of environmental law. Still, the effectiveness of the implementation of the international environmental law (IEL) continues to be criticized. For instance, in Rwanda, disasters continue to occur day by day and the number of victims who lose their lives is rising, not to mention the damaged heritage, both personal and common. For example, in May 2023, in Rwanda, around 130 people lost their lives in a single night due to rain and the damaged heritage is equivalent to 300 billion Rwandan francs, neighboring countries and especially the DRC are not spared either. Moreover, according to the 2023 Park Summary Annual Report published by the Rwanda Development Board and African Parks (2023), the Nyungwe National Forest which is the largest forest in Rwanda with covers an area of 1019 km^2, contains 1068 plants, 13 species of monkeys and 275 species of birds (Nyungwe Forest National Park Organization, 2025), were burned.

This study, therefore, seeks to assess the effectiveness of environmental law and regulation *vis-a-vis* Rwandan international engagement in the area of environmental protection. Nevertheless, the desire to make our modest contribution to the development of environmental law, and in particular environmental law in Rwanda, a scientific discipline that is still nascent, is at the origin of our inspiration to explore this theme that appears to us to be of great interest.

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The article opens with the introduction. It proceeds to examine the domestication of International legal frameworks regarding to environment, domestic legislation, Analysis of the Enforcement Provisions of specific international conventions and domestic laws will be made as each convention and law discussed as well as observations made in the process, Legal analysis of obstacles to the development of environmental law in Rwanda will also be the concern of this paper. The paper will conclude and recommendations made.

1.1 Statement of the Problem

The effectiveness of the implementation of the IEL continues to be criticized. Today, we cannot count the number of ecological disasters attributable to human activities that have occurred in recent decades on a global scale (Keirsbilck, 2020). Rwanda is not spared. For instance, the disasters continue to occur day by day and the number of victims who lose their lives is rising, not to mention the damaged heritage, both personal and common. According to the Ministry of Emergency Management (MINEMA) reports, since 2020 up to 2024, each year, more than 240 injured and 110 deaths occur in disasters (Ministry in Charge of Emergency Management [MINEMA] report of 2024. As for the loss of primary forest is concerned, between 2002 and 2024, Rwanda lost 550 hectares of primary rainforest, representing 1% of its total forest cover loss over the same period; moreover, the total area of primary rainforest experienced a decrease of 1% during this period (Global Forest Watch, 2024).

In addition, the environmental legislative arsenal still has a problem of enforcement measures, especially the Ministerial decrees provided for in different laws in force for their implementation are lacking to this day. For instance, the ministerial order provided at Article 19 of the law N°48/2018 of 13/08/2018 Law on environment pertaining to the disposal, management and trans-boundary movements of hazardous or toxic waste is not yet established. This ineffectiveness in implementation of IEL shows that the environmental legislative arsenal may have a problem of legal enforcement measures, which motivate this research paper in assessing the effectiveness of environmental law and regulation *vis-a-vis* Rwandan international engagement in the area of environmental protection.

1.2 Research Objectives

i. To assess the obstacles that hinder the effective application of international environmental protection conventions in Rwanda.
ii. To find out the constraints of implementing environmental regulations in Rwanda

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Notion of Environment

Legally speaking, the environment is understood as a set of components of a specific environment that the protection legislation designates *a contrario* by reference to the convenience of the neighborhood, to public health, safety and sanitation, to agriculture and nature, and finally to the conservation of sites and monuments (Comu, 2000). Although positive law does not currently offer a proper definition of the environment, reading certain texts seems to support the most extensive conception. Thus, in terms of impact studies, the environment includes, “in particular, fauna and flora, cities and landscapes, soil, water, air, climate, natural environments and biological balances” but the analysis of direct and indirect effects also concerns the protection of property and cultural heritage, and, where appropriate, the convenience of the neighborhood (noise, vibrations, odors, light emissions) or hygiene, health, safety, and public health (Van Lang, 2021, p.14).

Thus, based on the above, the environment is a balanced set of biotic and abiotic elements that surround a body and can interact with one another. The concept of “environment” includes (but is not limited to) spaces, resources, terrestrial and marine natural environments, sites, daytime and nighttime landscapes, air quality, living organisms and biodiversity, biological processes, soils, and geodiversity (Jaffré et al., 1997, p.1); abusive exploitation of resources and poaching.

2.1.2 Concepts related to the environment

The Biosphere

This is a thin layer that surrounds the earth and penetrates a few hundred meters below the surface of the earth and of course under the oceans. Lavieille (2004, p.7) describes it as including parts of the atmosphere (gaseous layer constituting the outer envelope of the Earth), the hydrosphere (all the waters of the planet) and the lithosphere (outer layer of the Earth consisting of the crust and the upper mantle).

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Ecology

This is the part of science that concerns the economy of nature, the study of all the relationships of organisms with their physical and biological environment. Christian (2003) considered ecology as "*a method for understanding society, transversally to our usual systems of interpretation, in order to ensure the quality of the relationships between man and his environment"*. He distinguished three ways of considering ecology in society, namely ecology applied to the environment, social ecology which deals with the relationships between man and his environment (couple, city, work) in order to rebuild denser social relationships, and mental ecology which deals with the subjective relationships between man and his body, time, in order to fight against standardization and depersonalization. (Christian, 2003).

The Ecosystem

This is a fundamental unit of study of ecology formed by the association of a community of living species and a physical environment in constant interaction. Chang (2010) pointed out that every ecological system or ecosystem comprises all the organisms (i.e., the "community") in a given area interacting with the physical environment in such a way that an energy flow generates a clearly defined trophic structure, biotic diversity, and cycles of matter (i.e., exchanges of matter between living and non-living parts) within the system (Odum, 1971, as cited in Christian, 2003, p.2). Christian (2003, p.2) highlighted that in the ecosystem possesses three common properties: the presence of (1) biotic and (2) abiotic components, and (3) their interactions. He explained that the biotic component is described as encompassing the communities of organisms, while the abiotic component includes their chemical and physical environments. These interactions can include those related to (1) food webs and trophic dynamics, and (2) the cycling of matter, particularly nutrients.

2.2. Empirical Review

2.2.1 International Conventions Relating to Environment

Over the past decades, multilateral agreements have multiplied, at the global and regional levels, to resolve global environmental problems. The development of this type of agreement is a complex and continuous process. After the Genocide against Tutsi in 1994, Rwanda has taken an important step by ratifying international conventions relating to the protection and promotion of the environment. In the period of more than nine years about ten international conventions in that area was ratified. These conventions include convention on Biological Diversity ratified in 1995 (Presidential Decree No. 021/01, 1995); United Nations Convention on Desertification (Presidential Order No. 17/01, 1995) and United Nations Framework Convention on Climatic Changes (UNFCCC) ratified in 1998 (Presidential Decree No. 021/01, 1995); the Vienna Convention for the Protection of the Ozone Layer accessed in 2000 (Rwanda Environment Management Authority, 2022); the Stockholm Convention on Persistent Organic Polluting Agents ratified in 2002. In 2003 more than three conventions have been ratified includes the Convention on the Conservation of Migratory Species of Wild Animals (Law N° 35/2003, 2003), the Ramsar Convention on Wetlands (Law n° 37/2003, 2003), the Convention on the Prior Informed Procedure for certain hazardous chemicals and pesticides in international trade (Presidential Order n° 28/01, 2003*)*, the Kyoto Protocol to the United Nations Convention on Climate Change (Law n° 36/2003, 2003), and Basel Convention on control of transboundary movements of hazardous wastes and their disposal (Rwanda Environment Management Authority, 2023).

Therefore, since Rwanda is a State Party to the aforementioned conventions, they have the force of law in Rwanda, considering that they have been incorporated into its national law. In the same perspective, at domestic level, in reaction different problems associated with issues of environment, several initiatives and pieces of legislation have been enacted, to address the challenges that flow there from. Since a brief presentation of all the international instruments cited above would lead us to exceed the editorial limitations established for this article, we will only dwell on the most important ones, including those related to climate change, biodiversity, and desertification, focus only on the obligation of states provided in environmental treaties.

In fact, the states party to the United Nations Framework Convention on Climate Change (United Nations Framework Convention on Climate Change [UNFCCC], 1992), have three kinds of obligations namely mitigations obligations, adaptation obligations and obligations of co-operation. In this perspective, as provided at its Article 4, states parties commit to safeguard the climate system for the benefit of present and future generations; to take into account the specific needs and special circumstances of developing countries, particularly those that are particularly vulnerable to the adverse effects of the response to climate change; to take precautionary measures to avoid, prevent or mitigate the causes of climate change and to limit its adverse effects; to work for sustainable development and take measures to protect the climate system against human-induced changes that are adapted to the specific circumstances of each party, and integrated into national development programs such as education and public awareness, and to prevent measures taken to combat climate change from constituting a means of imposing arbitrary or unjustifiable discrimination on international trade, or disguised obstacles to such trade.

The Convention on Biological Diversity (CBD, 1992), which is often considered the key document for sustainable development, has three main objectives (CBD, 1992, Art.1) namely the conservation of biodiversity (or

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biological diversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources. As stressed by Birnie and Boyle (2002, p.571). The objectives of this convention are reflected in substantial commitments of a binding nature under Articles 6 to 20. By ratifying this Convention, the Parties have committed themselves to develop national strategies and action plans, cooperate with other contracting parties for the conservation and sustainable use of biological diversity, integrate the conservation and sustainable use of biological diversity into relevant sectoral and cross-sectoral plans, programs and policies, as well as into national decision-making processes, use impact assessments to reduce adverse effects on biological diversity; adopt measures concerning research and training as well as education and public awareness on the conservation and sustainable use of the constituent elements of biological diversity.

The United Nations Convention to Combat Desertification (UNCCD, 1994) deals specifically with arid zones and promotes sustainable land management in all climatic zones. As provided at its article 4 and 5, this convention encourages Parties to establish strategies and priorities as well as relevant legislation by developing emergency plans; tackling the causes and socio-economic factors that promote desertification, to promote international cooperation on technology transfer, scientific research and development, collection and dissemination of information, strengthen capacities, education and public awareness, especially women and youth, for the fight against desertification, establish action programs, scientific and technical cooperation in the field of combating desertification (UNCCD, 1994, art.4-5).

Analysis of the provisions of international environmental conventions reveals that some important articles are not sufficiently binding and that their provisions remain inadequate. For example, Article 4 (2) of the UNFCCC does not provide effective methods for reducing greenhouse gas emissions in industrialized countries, which are nevertheless major sources of emissions. Furthermore, the Convention does not propose adequate methods for preserving the climate system and stabilizing greenhouse gas concentrations in the atmosphere, since it only mentions forests as a means of mitigating climate change.

III. METHODOLOGY

3.1 Research Design

This study utilizes an analytical research design, principally adopting a qualitative technique grounded in doctrinal legal research. This research is exploratory, aiming to evaluate the efficacy of international environmental conventions in Rwanda through a comprehensive review of legal texts, policy papers, and scholarly literature. It also used to review the existing institutional frameworks in Rwanda.

3.2 Data collection

The data collection involved an extensive desk review of primary and secondary sources. This process entailed the collection of national legislation, orders and regulations passed by Rwanda and ratified international treaties in the area of environment protection. Furthermore, policy documents and official reports from prominent government organizations, including the Rwanda Environment Management Authority (REMA), the Ministry of Emergency Management (MINEMA), and the Rwanda Green Fund (FONERWA), were examined. Academic texts, peer-reviewed publications, and doctrinal examinations acknowledged in the domain of environmental law were used to enhance depth and perspective.

During the data collection process, meticulous attention was devoted to the relevance, credibility, and timeliness of each source. Only documents pertinent to Rwanda's legal and institutional framework for environmental protection were incorporated. All chosen materials were mandated to be official and verified, prioritizing the most recent and relevant texts and reports. To uphold scientific rigor and reliability, non-official, non-academic, or unverifiable sources were removed.

3.3. Data Analysis and Presentation

The gathered resources underwent qualitative analysis, entailing a thorough examination and comparison of legal texts, international treaties, and policy documents. The research analyzed the integration and application of international treaties on biodiversity, climate change, and desertification within Rwandan legislation, highlighting both strengths and deficiencies in the current frameworks. Emphasis was made on legal and practical impediments that may obstruct effective implementation.

The findings are presented thematically, first with an overview of the domestication of international legal frameworks, followed by an analysis of national laws, enforcement mechanisms, and institutional difficulties. The discourse thereafter assesses the alignment of Rwanda’s legal and regulatory frameworks with its international obligations, emphasizing both accomplishments and persistent issues.

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IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Legal Analysis of Obstacles to the Development of Environmental Law in Rwanda

The Rwandan constitution: n Rwanda, environmental protection has been recognized as a constitutionally valued objective since 2003. The Constitution of Rwanda (2003, revised up date) affirms it as an individual right. In terms of article 22, everyone has the right to live in a clean and healthy environment, it also places the burden to ensure the protection of the environment on the state, establish the legal system determining the modalities for the protection, conservation and promoting the environment (Republic of Rwanda, 2003, revised up date, Art.53). In addition, it prohibits to the state to make international agreements permitting the transit or dumping, on national territory, of toxic waste and other hazardous materials likely to cause serious damage to public health and the environment (Republic of Rwanda, 2003, Art.170). Most importantly, it imposes on everyone the obligation to protect the environment (Republic of Rwanda, 2003, revised up date, Art.22).

Analytically, the Rwandan constitutions recognize the importance of inserting provisions of protection of environment, as it bears obligation on state as well as to the people or individual person which is on Rwandan territory. This situation demonstrates how the state of Rwanda elevates an environmental concern among the basic human rights and the society' norms protected in all level of law. However, it smees that some elements such as the protection of the ecosystems and biodiversity in the interest of future generations are missing in the text; furthermore, simply incorporating the environment into the Constitution as an object of individual rights is not enough to guarantee its effective protection, given that the law that will be promulgated under this constitution does not provide for provisions enabling the exercise of these rights, which make it a constitutional provision lacking judicial enforcement. Thus, incorporate into the Constitution that the Republic or the state must protects the environment, ecosystems and biodiversity, also in the interest of future generations and provide for legislative implementation of individual right to the environment, can make it more effective in protecting environmental rights.

4.1.2 Implementation of the Convention on Biological Diversity

Prior to 2005, laws on environmental protection lacked strong environmental frameworks that led to increasing degradation. In the implementing the CBD, the legislation on Environmental which determines the modalities of protection, conservation and promotion of environment in Rwanda was promulgated in 2005. It was the first major legal instrument on protection of the environment.

The 2005 environmental organic law established an Agency known as the Rwanda Environment Management Authority, which can be sue and be sued in its corporate name. It was created by law N° 16/2006 of 03/04/2006 with the aim of managing all problems related to the environment, including the management of biological diversity, is an achievement of environmental protection; a National Environmental Fund (FONERWA) was also created by law N° 39/2017 of 16/08/2017, whose mission is to mobilize and manage funds for the financing of activities aimed at the protection and preservation of the environment, natural resources and in the fight against climate change and its effects.

More importantly, policies and Strategies to protect the country's natural and cultural resources and the conservation and management of biodiversity have been adopted. First, since September 2011, a biodiversity policy, known as the "Rwanda Biodiversity Policy", has been adopted in Rwanda (Rwanda Environment Management Authority [REMA], 2016, p.7). The policy intended to provide a comprehensive and coherent policy framework to strengthen the government's capacity to conserve and protect the country's natural and cultural resources; to provide a legal and institutional framework for biodiversity conservation and management throughout the country; to promote partnerships, incentives and benefit sharing to improve biodiversity conservation and management; to promote the generation, management of conservation knowledge, including traditional knowledge, and its application in biodiversity conservation, to provide a framework for access to genetic resources and sharing of benefits arising from these resources and to promote positive attitudes towards biodiversity conservation and management.

Furthermore, the Rwanda National Biodiversity Strategy and Action Plan (Rwanda Environment Management Authority [REMA], 2020) was adopted, which reflects a framework for the conservation, sustainable use and equitable sharing of benefits arising from the use of the country's biodiversity and ecosystem services. It also provides a framework to maintain the environmental conditions necessary to reduce poverty, ensure sustainable development and food security of the country (REMA, 2023, p.72). In the same vein, in the year 2020 REMA put in place a national strategy for the implementation of the biosafety framework (REMA, 2020), with the objective of ensuring and guaranteeing public and environmental safety with regard to accident prevention, containment and waste disposal when genetically modified organisms (GMOs) are used in research and development (R&D) as well as in the industrial production process and promoting biosafety in the application and exploitation of innovative technologies of biotechnology products for the general well-being of humanity. Certainly, modern biotechnology can help genetically fingerprint plant and animal species in order to preserve endangered species through biochemical control of pests and

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diseases, cloning of species and exploitation of plants to produce biofuel, a more energy source respectful of the environment.

Importantly in view of implementing the international convention on biological diversity the 2005 legislation on environment has been repealed in order to address new environmental challenges like land degradation, electronic waste, climate change and strengthening enforcement mechanisms among others. In the same objective, Rwanda had promulgated a special law, namely Law No 064/2021 of 14/10/2021 governing biological diversity, the purpose of which is to determine the modalities for the conservation, management, protection and promotion of biological diversity in Rwanda.

4.1.3 Implementing the Convention to Combat Desertification

The United Nations Convention to Combat Desertification (UNCCD, 1992) is the only legally binding multilateral environmental agreement that addresses the challenges of desertification, drought and land degradation, from both an environmental and a development perspective.

In Rwandan, the state started addressing the problem of desertification with the adoption of the national policies and legal strategies on the Environment. Since 2006, a National Strategy and Action Plan (Republic of Rwanda, 2023) to combat desertification has been put in place. Among the targeted initiatives there are actions for the fight against erosion and management of natural resources, reforestation activities and rehabilitation of damaged forest areas, integrated management of watersheds, rainwater retention for agro-pastoral activities, the fight against the reduction of natural water reservoirs. In February 2018, a National Forest Policy was presented, with the overall objective of defining, in concise statements, the government's medium and long-term intentions for the development and management of national forest resources. Forest resources will be managed to play a vital role in supporting Rwanda's development goals for sustainable, low-carbon and climate-resilient development in order to improve the livelihoods of present and future generations.

Other efforts made by the Rwanda authorities with a view to prevent and control desertification include the establishment in 2008 of the National Forestry Authority (NAFA) (Law no. 17/2008, 2008) which was replaced in 2019 by a new institution called Rwanda Forestry Authority (RFA) (Law no. 72/2019, 2020) whose mission is to ensure the increase of forest resources, their management and their protection for the purposes of sustainable development (Law no. 72/2019, 2020, Art.5).

4.1.4 The Implementing of the UN Framework Convention on Climate Change

The fight against climate change is one of the priorities of our century. The risks that climate change poses to humanity are so great that the world's governing bodies are compelled to take action to avert the danger. To this end, the principles established for environmental protection in general are being applied; this is the case with the principle of common but differentiated responsibilities, proclaimed in the Rio Declaration (1992, Principle 7). According to this principle, all states and all people are obligated, each according to their capabilities, to protect the environment. In the fight against climate change, this principle plays an important role, especially since developing countries have emphasized the responsibility of industrialized countries in the face of the current disastrous state of the climate (Rio Declaration, 1992, Principle 7). However, under the aforementioned principle of common but differentiated responsibilities, a country like Rwanda is also obligated to apply international legal instruments to combat climate change.

In fact, as also pointed out by Chang (2010), the binding nature of legal obligations arising from international legal instruments in environmental matters, as well as in other matters, is not sufficient to make a legal document effective; it is their implementation at the national level and compliance with these obligations that make them effective. The country of Rwanda, following the effects of the war and the genocide perpetrated against the Tutsi, had a problem of lack of information relating to climatic phenomena. To overcome these shortcomings, a project to install and rehabilitate hydro-meteorological stations was initiated (Republic of Rwanda, Ministry of Environment, 2015). As part of the implementation of the Climate Change Convention, Rwanda had prepared the national action plan (NAPA) since 2005. The report made on the NAPA has guided policy makers and national planners on the priorities of vulnerable economic sectors as well as the priority strategies and actions for adaptation to climate change that have been identified (Republique du Rwanda, 2006). Since then, the climate change management policy has been initiated. This policy aims to put in place the systems, structures, programs, resources and capacities necessary to reduce disaster risks and consequently react against and find solutions to disaster threats in Rwanda in order to save human lives, limit losses of property, the economy and the environment to a minimum and finally ensure the continuity and sustainability of development.

On the institutional level, apart from the institutions in charge of the environment in Rwanda, in particular, the Ministry of Environment; Rwanda Environment Management Authority (REMA), Rwanda Forestry Authority (NAFA) and Rwanda Green Fund (FONERWA) for the forestry sector, a Ministry in charge of disasters "MINEMA" has been set up, including those related to climate change.

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At the strategic level, since 2019, the National Policy on Environment and Climate Change has been established. This reaffirms the commitment to combat climate change and the determination to mitigate the potential challenges that climate change may pose to the sustainable development of Rwanda. The proposed project must recognize the National Policy on Environment and Climate Change and ensure that the improvement of the development and well-being of Rwandan citizens are taken into account, while including environmental aspects in the decision-making process. Rwanda must be a nation with a clean and healthy environment, resilient to climate variability and change, which promotes a high quality of life for its society (Rwanda Environment Management Authority, [REMA], 2023, p. 72). Moreover, as a party to the UNFCCC, Rwanda seeks to contribute to the ambitious goal of limiting temperature increase to 2°C with efforts to reach 1.5°C agreed under the Paris Agreement. In this respect, the 2020 Rwanda's enhanced Nationally Determined Contributions (NDC) document presents the government's update of its first NDCs for mitigation and adaptation for the period up to 2030. In the same vein, the Rwandan authority had adopted a Strategic Environmental Management Plan (2022-2026), which sets out the main priorities for the next five years. The overall objective of this strategic plan is to achieve better environmental management and increased resilience to climate change for sustainable development and livelihoods (REMA, 2022).

4.1.5 Implementation constraints on environmental regulations in Rwanda

Although numerous regulations, policies and strategies exist to support environmental conservation, the efficacy of the regulations has been limited due to several key factors, including non-adapted legislation, abundance of legal texts that may sabot their implementation and their enforcement by institutions in charge of prosecution and adjudication the environment crimes, challenges associated with demographic growth and pressure, insufficient information and human and lack of awareness on environmental issues.

In principle, if legislation has gaps or deficiencies, it cannot adequately ensure effective protection. The absence of implementing texts and the antagonism between certain laws (particularly land and forestry laws) poses a major problem of interpretation, which is added to that of their understanding, linked to the use of technical language, complicating their understanding by the majority of the local population. In fact, this is the case, for example, of Law N° 064/2021 of 14/10/2021 governing biological diversity, all the terms used in the three annexes of this law, namely critically endangered (Law No. 064/2021, Annex n° 1, p.86), endangered species (Law No. 064/2021, Annex n° 2, p.121) and vulnerable species (Law No. 064/2021, Annex n° 3, p.154) species are purely scientific and written in English and which make them incomprehensible to the population.

Furthermore, the abundance of legal texts generates conflicts and contradictions, which can also complicate their effective implementation. In Rwandan legal system, the legal provisions that protect the environment are scattered in the various sectoral and other legal texts. Thus, these provisions are found in laws regulating forestry (Law no. 46/2024, 2024), in land laws (Law no. 27/2021, 2021), in urban planning codes (N° 04/Cab.M/015, 2015), in the law determining offenses and penalties in general among others; this leads to contradictions in the penal provisions, and even a conflict of laws, especially with regard to the penalties provided for by these various provisions for the same offenses and complicates the task of those responsible for solving environmental problems. For example, ecological offenses are provided in two different legal instruments and provided penalties are very different. The Article 57 of the law on environmental protection provides for ecological offenses and their penalties and the same ecological offenses are also provided for and punished by the law on the use and management of water resources in Rwanda at its Article 38 (Law no. 49/2018). The penalties are totally different, in the law on the environment, the immersion of waste in a humid place is punishable with a penalty of imprisonment of at least three (3) years but not exceeding five (5) years and a fine of at least 5,000,000 Frw but not exceeding 10,000,000 Frw, while in law on the use and management of water resources in Rwanda the provided sentence is an imprisonment of at least one (1) month but not exceeding three (3) months and a fine of at least 2,000,000 Frw but not exceeding 5,000,000 Frw or one of these penalties only.

A part for legal other challenges including demographic growth and pressure, insufficient information and human material are also to be highlighted in Rwanda as well as some other countries. Firstly, the strong demographic growth of an agricultural population leads to strong pressure on the land and therefore differential degradation. This is the case of Rwanda, a country with a very small area with very high population growth rates where the population number is 14,173,629 on the area of 26,388 km^2, i.e. 571 populations per square kilometer (Worldometer. (n.d.). As land becomes increasingly scarce, the search for new arable land becomes inevitable, while the old ones are overexploited without restoring fertility due to fragmentation, relief and low purchasing power to obtain agricultural inputs. Soil degradation is then inevitable for these soils of low natural fertility that do not allow agriculture on all soils. Additionally, there is the problem of mass awareness of environmental problems among the public, and for that some abuses of environment can be committed because ignorance.

Furthermore, the ignorance can also be a major obstacle to the enforcement of environmental legislation and access to legal remedies. Therefore, it is important to emphasize that everyone must be aware of the consequences of

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their own omissions or actions, as well as those of others or institutions, on the environment and their impact on their own lives.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusions

Issues such as deforestation, climate change, biodiversity loss and global warming, are all concerns for the international community. Similarly, any initiative or development project must be guided by the principle of common concern for humanity. Rwanda, which is among the countries endowed with significant natural resources, is heavily dependent on this natural capital for its development.

An analysis of laws relating to the environment, biodiversity and forests and their effectiveness was carried out. The study demonstrates that despite the existence of more or less well-constructed legislative and regulatory frameworks, the adaptation of environmental laws is needed and the legislative efforts require some adjustments in order to meet the challenges they currently pose. Additionally, the lack of awareness of environmental issues in Rwanda also hinders effective environmental regulation and management.

5.2 Recommendations

Drawing from the findings of this study, for enhancing the success of the effective application of international environmental treaties in Rwanda, the research recommends that the Government of Rwanda should ensure incorporate the protection of the ecosystems and biodiversity in the interest of future generations in the Rwandan constitution. It should also harmonize the environmental laws and ensure that technical language and terms used in environmental laws that complicate understanding, for example those relating to critically endangered species, threatened species and vulnerable species, are translated into language understandable by the majority of the population. Lastly, the public authority should advocate environmental education for all in order to arouse in the population, the ecological awareness that is still often not sufficient in our country today.

Declaration of Interest

The authors declare that they do not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

Birnie, P., & Boyle, A. (2002). *International law & the environment* (2nd ed.). Oxford University Press.

Chang, H. (2010, February 23). A “legally binding” climate agreement: What does it mean? Why does it matter? [Blog post]. Columbia Law School's Center for Climate Change Law. https://blogs.law.columbia.edu

Christian, R. R. (2003). Concepts of ecosystem, level and scale. In A. Bodini (Ed.), *Ecology: Vol. I. Encyclopedia of life support systems* (EOLSS). EOLSS Publishers. https://www.eolss.net/sample-chapters/c09/E6-70-05-01.pdf

Convention on Biological Diversity. (1992, June 5). 1760 U.N.T.S. 79. https://www.cbd.int/doc/legal/cbd-en.pdf

Cornu, G. (2000). *Vocabulaire juridique* (8e éd.). PUF.

Dewi, K., Harmono, Harmono., Wei, S., Yang, L., & Zani, N. B. (2025). International environmental law and climate change mitigation efforts. *Rechtsnormen Journal of Law, 3*(1), 56–66. https://doi.org/10.70177/rjl.v3i1.2070

Global Forest Watch. (2024). Global primary forest loss: Primary forest loss in Rwanda. University of Maryland and World Resources Institute. https://www.globalforestwatch.org

Jaffré, T., Veillon, J. M., Rigault, F., & Dagostini, G. (1997). Impact des feux de brousse sur la flore et les groupements végétaux. ORSTOM. https://horizon.documentation.ird.fr/exl-doc/pleins_textes/doc34-01/010011057.pdf

Keirsbilck, C. (2020). Droit pénal de l'environnement: Le droit répressif permet-il une protection effective de l'environnement? (Master's thesis, Université catholique de Louvain). DIAL.memories. https://hdl.handle.net

Lavieille, J. M. (2004). *Droit International de l’environnement* (2e éd., p. 7). Ellipses.

Nyungwe Forest National Park. (2025). 13 facts about Nyungwe National Park. https://www.nyungweforestnationalpark.org/13-facts-nyungwe-national-park/

Republic of Rwanda. (2003). *Constitution of the Republic of Rwanda*. Official Gazette n° Special of 04/08/2023.

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Republic of Rwanda. (2006). National adaptation programmes of action to climate change. UNFCCC. http://unfccc.int/resource/docs/napa/rwa01e.pdf

Republic of Rwanda. (2015). Ministerial Order N° 04/Cab.M/015 of 18/05/2015 determining urban planning and building regulations. Official Gazette nº 20 bis of 18/05/2015. https://faolex.fao.org/docs/pdf/rwa165850.pdf

Republic of Rwanda. (2023a). Ministry in Charge of Emergency Management (MINEMA), Disaster management annual report 2020–2024. Government of Rwanda.

Republic of Rwanda. (2023b). Ministry of Environment, The six hydro-meteorological stations of information and monitoring system for the Nile Basin were installed in Rwanda. Government of Rwanda. https://www.environment.gov.rw/news-detail/the-six-hydro-meteorological-stations-of-information-and-monitoring-system-for-the-nile-basin-were-installed-in-rwanda

Republique du Rwanda. (2006, décembre). Ministère des Terres, de l'Environnement, des Forêts, de l'Eau et des Mines. Programmes d'action nationaux d'adaptation aux changements climatiques au Rwanda.

Rwanda Development Board & African Parks. (2023). 2023 park summary annual report – Nyungwe National Park. https://visitnyungwe.org/wp-content/uploads/sites/5/2024/05/2023-Annual-Report.pdf

Rwanda Environment Management Authority. (2016). National biodiversity strategy and action plan (2016–2020). https://www.rema.gov.rw/1/default-title-1

Rwanda Environment Management Authority. (2020, September). National strategy for implementation of biosafety framework. Government of Rwanda. https://www.rema.gov.rw/resources/publications

Rwanda Environment Management Authority. (2022). Strategic plan (2022–2026). Government of Rwanda. https://www.rema.gov.rw

Rwanda Environment Management Authority. (2023, June). Environmental and social framework (ESF) instruments for Volcanoes Community Resilience Project (VCRP) [Report]. Government of Rwanda. https://www.rema.gov.rw

United Nations Convention to Combat Desertification. (1994, October 14). Those countries experiencing serious drought and/or desertification, particularly in Africa. 1954 U.N.T.S. 3. https://treaties.un.org/doc/Treaties/1996/12/19961226%2001-46%20PM/Ch_XXVII_10p.pdf

United Nations Framework Convention on Climate Change. (1992, May 9). 1771 U.N.T.S. 107 (entered into force March 21, 1994).

Van Lang, A. (2021). *Droit de l'environnement* (5e éd.). PUF. https://www.cairn.info

Vienna Convention on the Law of Treaties. (1969, May 23). 1155 UNTS. 331. https://legal.un.org

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Perceived mitigation measures for sanitation challenges in George Compound, Lusaka, Zambia: A stakeholder perspective

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ABSTRACT

The study is significant as it contributes to Sustainable Development Goal number 6, for which countries are expected by 2030 to achieve sanitation services for all citizens. In response to the global vision and in alignment with the National Water and Sanitation Policy, the government has implemented several sanitation interventions across the country and in Lusaka peri-urban areas. The study was guided by an objective that sought to explore stakeholders' perceived mitigation measures for sanitation challenges in the peri-urban areas in Lusaka. The study was based on an interpretive phenomenological paradigm, which was anchored on the relativist ontological stance, which posits that there is no single reality but rather multiple realities in the understanding of sanitation challenges and their associated mitigation measures. The study's sample size was 29 participants, disaggregated as 10 males, 15 women, and 4 key informants. Data was collected using in-depth interviews targeting community beneficiaries and key informant interviews targeting institutions. The researcher deployed open-ended questions to elicit participants' views on sanitation. The collected raw data was analysed using a reflexive thematic analysis. The thematic analysis adopted Braun and Clarke's six-stage framework for thematic analysis, in which themes were developed through an iterative process and by merging the researchers' experiences with the participants' lived experiences. The study found that despite increasing inspectors' compliments in regulatory institutions, it falls short of the expected effort to mitigate sanitation challenges. Moreover, LWSC is under a new policy direction slanted towards digital integration as a mechanism to facilitate customers paying for on-site sanitation as well as a platform for lodging complaints. Furthermore, the introduction of scheduled desludging offers a panacea for improved pit emptying services. Under this model, households register their pit latrines and make small routine contributions, which enables the service providers to plan for pit emptying services as and when the pit latrines fill up. The part payment option reduces the financial burden on the most affected low-income communities. This model provides mitigatory measures that help avert pit latrines from overflowing. The researcher used systems theory to highlight the interdependence of institutions, service providers, and communities, demonstrating that weaknesses in any component can compromise the sanitation system. The researcher applied a systemic thinking mirror, a coordinated and integrated approach to resolving sanitation challenges. The identified mitigation measures will inform sanitation practices and mitigatory measures for sanitation challenges imminently affecting the peri-urban areas of Lusaka. The study recommends harnessing resources to bolster scheduled desludging and digitalisation of on-site sanitation. The study explored the stakeholders' perceived mitigation measures for sanitation challenges affecting communities in the peri-urban areas of Lusaka.

Keywords: George Compound, Lusaka, On-Site Sanitation, Pit Emptying Services, Sanitation Mitigation Measures, Zambia

I. INTRODUCTION

Most of the peri-urban areas in Lusaka face unique sanitation challenges, particularly at the household level, which often has compromised public health and safety in different areas. To understand these challenges, this paper was guided by an objective that sought to identify stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas. This section covers the study background, methodology, findings, conclusion, and recommendations. The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2019). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewered network. Thirteen percent of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered 'unimproved' sanitation facilities (National Water Supply and Sanitation Council [NWASCO], 2018). Globally, most governments, including Zambia, are committed to the Sustainable Development Goals (SDGs) and the

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African Union's Agenda 2063. Sustainable Development Goal 6 is to ensure the availability and sustainable management of safe water and sanitation for all by 2030. The water and sanitation goals are defined by eight targets that specify the objectives, and progress towards the 2030 Agenda for Sustainable Development is measured using 11 indicators as metrics by which the world aims to track whether these targets are achieved (Rajapakse et al., 2023). A study conducted by the United Nations (2015) shows that most countries are not on track to meet their objective of ensuring the availability and sustainable management of water and sanitation for all. The United Nations General Assembly (2010) posits that water and sanitation are recognized as human rights under international law. Furthermore, international monitoring data show that the world still has a long way to go to ensure everyone has access to safe services (Howard, 2021). According to a study conducted by Kivunja and Kuyini (2017), over 2.3 billion people all over the world still lacked basic sanitation service, and 844 million people still lacked basic drinking water. According to the global statistics, there are an estimated 3.4 billion people, or 45% of the population, who used safely managed sanitation services in 2017 (World Health Organization & United Nations Children's Emergency Fund [WHO/UNICEF], 2021).

Moreover, the World Health Organization and UNICEF (2017) established that the available data are limited, and national estimates were only available for 96 countries, representing 54% of the global population. Regionally, water and sanitation are anchored on Agenda 2063, whose aspiration is that Africa shall have equitable and sustainable use and management of water resources for socio-economic development, regional cooperation, and the environment (Africa Union, 2015). Moreover, global think tank institutions, such as the World Health Organization, observed that safe water and sanitation are essential to the health of all Africans as well as to the social and economic development of their countries, yet millions lack access to both. Nationally, the country's water and sanitation regulatory institution, the National Rural Water Supply and Sanitation Program (2006), reveals that inadequate water and sanitation infrastructure is mainly due to low financial investments in the sector, with an annual allocation of less than 3% of the national budget. Moreover, the National Rural Water Supply and Sanitation Program (2006) further notes that the investments have been skewed towards water supply as opposed to sanitation, and this situation has been compounded by a lack of a clear policy on sanitation issues. Subsequently, Zambia has developed a comprehensive policy to guide the development and management of the sanitation and water sectors. The specific policy measures for rural water supply and sanitation include a community-based approach, the promotion of appropriate technology, and capacity building at all levels (National Rural Water Supply and Sanitation Program, 2006). The study aim was to explore sanitation programs' lived experiences among the stakeholders in Lusaka's George Compound.

1.1 Statement of the Problem

The Government of Zambia remains committed to accelerating universal access to water supply and sanitation to achieve a healthy and productive nation (NWASCO, 2018). Pit latrines are the dominant form of sanitation in peri-urban areas, used by about 88% of households (ECA, 2018). Thus, to improve public health, the government, with the support of AfDB, constructed 5,000 household toilets in peri-urban areas.

The sanitation challenges remain severe in peri-urban areas of Lusaka, where approximately 70% of the city's two million residents reside (Brown et al., 2012). Most households in Lusaka Province rely on on-site sanitation facilities, while only 15% are on the sewered network. Thirteen percent of the facilities used were improved toilets, such as the Ventilated Improved Pit (VIP) latrines, which can be safely managed if constructed to standard, while 19% of facilities were traditional and considered as 'unimproved' sanitation facilities (NWASCO, 2018).

Moreover, sanitation is compounded by poor infrastructure coupled with weak regulatory enforcement in most peri-urban areas (Lerebours et al., 2021). Equally, the roles and enforcement mandates among key regulatory actors remain poorly defined, resulting in fragmented implementation of sanitation laws and standards (SNV, 2024).

As a result of the poor sanitation situation in Lusaka, there have been recurrent outbreaks of cholera, typhoid, and dysentery, contributing to significant morbidity and mortality (Brown et al., 2012). Furthermore, the disease outbreak makes the government lose an estimated US$194 million annually due to poor sanitation—equivalent to 1.3% of GDP (Brown et al., 2012). Similarly, approximately 3.4 million deaths occur each year from water-related diseases at a global level (WHO/UNICEF, 2017). Therefore, the researcher explored the stakeholders' lived experiences in sanitation programmes in Lusaka's George Compound.

1.2 The Study Purpose

The study objective was to explore the lived experiences of stakeholders in sanitation programmes in Lusaka's George Compound.

1.3 Research Objective

The objective of the paper was to address the identified stakeholders' perceived sanitation challenges in Lusaka's peri-urban areas.

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1.4 Research Question

The paper answered how stakeholders' perceived identified sanitation challenges can be mitigated in Lusaka's peri-urban areas.

II. LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Systems Theory

The researcher adopted systems theory, which was first introduced in the 1940s by biologist Ludwig von Bertalanffy. Systems theory is a conceptual framework based on the principle that the component parts of a system can best be understood in the context of their relationships with each other and with other systems, rather than in isolation (Wilkinson, 2011). Systems theory has significantly influenced our understanding of organizational behaviour and change, and a systems approach can increase our ability to identify the underlying causes of problems and determine the optimal solution (Wilkinson, 2011). Systems thinking is the examination of systems from the perspective of the entire system, interrelated subsystems, and repetitive patterns occurring among subsystems. Systems thinking provides a holistic analytical method to analyse how a system's integral components relate and function over time and within the context of larger systems. Systems thinking is useful for complex or complicated problems that cannot be solved by a single entity, because complex systems cannot be effectively understood from only one perspective.

The theory is in alignment with the study's ontological position, which holds that reality is multiple and requires understanding of the whole by its various parts. In this context, applying systemic thinking would help in understanding various stakeholders' experiences of sanitation programme implementation, as well as how systems interact to address sanitation programme challenges in the study area, thus helping the researcher in the interpretation and discussion of findings.

2.2 Empirical Review

2.2.1 Pollution Control and Sanitation

A study conducted by Strande et al. (2014) revealed that services that operate to empty and transport fecal sludge from on-site sanitation containment systems—without which sludge would be left on-site, pits and septic tanks would overflow, and sludge would not reach treatment or safe disposal sites—are crucial to enable a safely managed sanitation chain. Similarly, a study conducted by Lawrence and Macdonald (2001) highlighted this risk when they reported that most pathogens that affect humans are derived from human waste transmitted by the faecal-oral route, and that transmission may occur through a variety of routes, including food, water, poor personal hygiene, and flies. In Kanyama, as in other parts of the city, residents sell foodstuffs including fruits and meat on the streets, and most of these are not properly covered. Hence, flies can come into contact with these foodstuffs and contaminate them. Moreover, Lawrence et al. (2001) reported that where hydraulic loads are high, the liquid part of the waste infiltrates into the soil and represents a hazard to groundwater. Banerjee (2010), in his study, reported that pollution travels from pits in both horizontal and vertical directions, and that a minimum travel of pollutants of 2.055 metres was found in clay silt soil, whereas a maximum travel of 10.20 metres was observed in gravel/sand composition of soils in a ten-day period. Furthermore, another study conducted by Dzwairo et al. (2006) noted that the shallow water table increases the pollution potential from pit latrines. Used oil has the potential to cause health problems because it produces a pungent smell, which pollutes the air and may lead to residents falling over because it is slippery.

2.2.2 Enforcing Building Regulations

One of the studies conducted by Mawejje et al. (2018) disclosed that the country's environmental regulator, the National Environmental Authority (NEMA), needs to enhance effective monitoring of service providers to ensure compliance with waste transportation regulations. With the support of local leaders and community activation teams in each informal settlement, emptying schedules can be locally arranged, as was piloted with mobile transfer stations. Moreover, in large multi-household units, the study suggests that the number of toilets provided is close to inadequate (in-house units with toilets: if every resident uses the toilet, the average number of users per seat is eight). On the regulatory side, there are tools available to create incentives for improved household provision (such as enforcing the building regulations that require the provision of suitable sanitation). However, given the risks to low-income households if rents are raised to cover costs, these interventions should be seen within the wider context of sustainable housing supply for Kumasi. Legal or social/economic instruments that ensure landlords provide adequate, well-serviced toilets for each household or a minimum number of tenants, coupled with appropriate financial incentives, could also address this (Peprah et al., 2015). The foregoing study conducted in Kumasi noted that legal or socio-economic instruments might help landlords to provide adequate sanitation, coupled with financial incentives. This study was conducted in Ghana, whereas few studies have been conducted in Lusaka, the study area, addressing those aspects; hence, this study might help in addressing those aspects in the area, filling the contextual as well as the knowledge gap.

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The regulations developed in the three cities have some similarities, such as emptiers in each city should register their businesses, obtain licenses to operate from the local government and/or the utility, and licenses for their trucks. They must follow standard operating procedures, key performance indicators or minimum operating standards, and report on their work. The bylaws developed by the three local governments (two pending approval) cover the entire sanitation chain and emphasize health and safety requirements, mandatory sites for disposal, and operational standards. All three cities have set up call centres, together with monitoring and information systems (under development in Lusaka and Freetown). They all gather customer feedback through their call centres and other complaint hotlines. Local government and other regulators monitor emptiers through this feedback and spot checks, including visits to emptying sites. However, mapping sanitation facilities (even if only partial), standards for sanitation facilities, licenses from the environmental regulator, self-reporting by emptiers, and regulation by contract—where emptiers are under contract with the municipality or utility to provide a specific service with measurable performance indicators—can only be found in Kampala and Lusaka. Lusaka is the only city in which pit emptiers are not allowed to operate without a contract and consequently charge a specific fee set by the utility. In Kampala, emptying prices are not fixed, except when the service is subsidized by Kampala Capital City Authority (KCCA) (Lerebours et al., 2022). This study was conducted in the peri-urban area where limited studies have been conducted on the subject, thereby contributing to empirical evidence as well as bridging the contextual gap.

2.2.3 Scheduled Desludging

The scheduled desludging model has benefits for all stakeholders along the FSM chain and has the potential to improve the functionality of the service chain. This can enable informal settlement dwellers to adequately plan for desludging their sanitation facilities, as opposed to emptying their pit latrines or septic tanks only when they are overflowing. This will reduce the risk of environmental pollution as a result of not emptying faecal matter into streams during the rainy season, as noted by Kulabako et al. (2007).

2.2.4 Incentives and Subsidies

All three cities have taken steps to support emptiers and incentivize them to operate in a formal and regulated manner. They were engaged early in the regulatory process to ensure the acceptability of the regulation and buy-in from emptiers. Initiatives to increase demand for services included marketing of safe services, call centres, and in Kampala and Lusaka, subsidies to empty pits and tanks and to build or upgrade toilets that are emptiable. Support to formalize businesses took the form of training and the supply of personal protective equipment (PPE) and tools in the three cities. Business clinics or equivalents were provided in Kampala and Lusaka, and mobile transfer stations were occasionally provided in Kampala (Lerebours et al., 2022b). The above study conducted in Freetown disclosed some of the steps that have been taken to operate in a regulated manner; however, there is limited empirical evidence in the study area on these nuances. Hence, undertaking this study ascertained if such measures were being undertaken for services offered in the peri-urban areas, thus bridging the contextual gap.

III. METHODOLOGY

3.1 Research Paradigm

The study adopted an interpretive phenomenological paradigm, which viewed reality from a relativist ontology, holding that reality is multiple and contextual. Scotland (2012) asserts that reality is relative to how individuals experience it at any given time and place. Moreover, in terms of epistemology, the researcher adopted a subjective epistemological stance, in which knowledge is generated through personal experiences and interaction with participants (Kivunja & Kuyini, 2017). Using this epistemological stance, the study generated knowledge by interpreting meaning from the participants' experiences. Further, the study adopted a value-bound axiological stance, hence acknowledging that one's positionality in terms of personal background, experience, values, and beliefs influenced the study while prioritizing ethical considerations. Kivunja and Kuyini (2017) define axiology as the ethical issues that need to be considered when planning a research proposal. The study applied inductive logic in data collection and data analysis, reasoning from the specific (participants sampled) to the general study area.

3.2 The Research Design

The study adopted the exploratory case study design to gain in-depth insights about sanitation by focusing on a single case. Gerring (2004) emphasizes that a case study is an intensive study of a single unit for understanding a larger class of (similar) units, where the unit connotes a spatially bounded phenomenon observed at a single point in time or over some delimited period. According to Cresswell (2007), a case study is a good approach when the inquirer has identifiable cases with boundaries and seeks to provide an in-depth understanding of the cases or a comparison of several cases.

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3.3 Sampling, Location, Population, and Procedure

3.3.1 Study Location

The study was conducted in George Compound, one of the peri-urban areas located west of Lusaka. The location was selected based on the sanitation programmes, which involved the construction of household toilets. The programme was implemented there by the government of Zambia through the Lusaka Sanitation Program.

3.3.2 The Study Population

The study population is defined as a set of cases, determined, limited, and accessible, that constituted the subjects for the selection of the sample, and must fulfill several characteristics and distinct criteria (Arias-Gómez et al., 2016). The study sampled the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department). The population was selected based on the participants' experiences working on the sanitation programmes in the peri-urban areas.

3.3.3 The Study Sample Size

The researcher adopted a qualitative research approach in which the sample size was determined based on the principle of data saturation. Suri (2011) notes that data saturation is associated with the situation when further collection of data provides little in terms of 'further themes, insights, perspectives or information'. Therefore, the researcher determined sample size after conducting interviews with 29 participants (10 males and 15 women) and 4 key informants.

3.3.4 Sampling Procedure

Purposive sampling was employed, which is the intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon (Robinson, 2014). Furthermore, criterion-based purposive sampling was employed in this study. This type of sampling calls for the researcher to set a specific criterion which should be followed for participants to take part in the study. Samples were selected from participants who have experienced and benefited from the sanitation programmes that were implemented by the government for the past ten years. The government stakeholders were selected based on their experience implementing sanitation programmes in the study areas. The selected study participants comprised the beneficiaries of sanitation programmes, the Ward Development Committee, the Water and Sanitation Committee, the Lusaka City Council (Public Health Department), the Zambia Environmental Management Agency (Inspectorate), the National Water Supply and Sanitation Council, and the Lusaka Water Supply and Sanitation Company (Peri-Urban Department).

3.4 Data Collection Instruments

The collection of primary raw data from the field was based on the deployment of key informant interviews targeting government officials and community opinion leaders, and in-depth interviews targeting the sanitation programme beneficiaries.

3.4.1 Key Informant Interviews

Key informant interviews were deployed based on their quality to conduct intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation. This choice of data-collecting tool is appropriate for open-ended questions for a qualitative study. The key informant interviews (KIIs) are a valuable qualitative research method aimed at collecting in-depth insights and viewpoints from individuals who possess specialized expertise in a particular field. This method involved conducting one-on-one interviews with key informants to gain a comprehensive understanding of their knowledge, experiences, and perspectives, thus providing valuable qualitative data for research and analysis (Akhter, 2022). The study deployed this method targeting government officials and community leaders based on their experience working in the sector or experiencing the sanitation programme interventions in the study area.

3.4.2 In-Depth Interviews

The study also deployed in-depth interviews to generate qualitative data. The in-depth interviews can be quite unpredictable and varied and are well suited to exploratory research and other research interested in meaning and experiences (Osborne & Grant-Smith, 2021). The data collection instrument is suited for this study as it leans on gathering sanitation beneficiaries' lived experiences in an unrestricted manner as opposed to structured instruments which restrict participants' responses.

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3.4.3 Data Collection Procedures

Self-administered interviews were deployed in the field to elicit the participants' views and experiences. The interviews were conducted either in English or translated into the local language spoken by the participant. The study participants to be interviewed were selected using the criterion of purposive sampling. The interview duration lasted between 50 to 60 minutes. Data collection devices such as audio recording were used after obtaining consent from the study participants.

3.5 Data Analysis

Raw data was manually analysed using a reflexive thematic analytical research approach in line with the study's philosophical paradigm. According to Kiger and Varpio (2020), thematic analysis is an appropriate method of analysis for seeking to understand experiences, thoughts, or behaviours across a data set. Themes are actively constructed patterns (or meanings) derived from a data set that answer a research question, as opposed to mere summaries or categorizations of codes. The study adopted the Braun and Clarke framework for conducting thematic analysis, which involves a six-step process: data familiarization, generating initial codes, theme identification, reviewing themes, defining and naming themes, and producing the report (Kiger & Varpio, 2020). The above themes helped in building patterns for interpreting the study findings in line with the study objectives and purpose.

3.6 The Study Trustworthiness

The study employed Lincoln and Guba's criteria to ensure trustworthiness. The scholars identified four criteria: credibility, transferability, dependability, and confirmability (Ahmed, 2024). Ahmed (2024) notes that credibility and trust are built through rapport with participants over time, which allowed the researcher to gain deeper insights into their experiences, behaviours, and beliefs. This approach helped the researcher capture rich data that might not emerge during brief interactions. Moreover, the study achieved transferability by thoroughly describing the research context, participants, and methods, allowing readers to assess similarities between the study and their own contexts and judge whether the findings might apply to their settings (Ahmed, 2024). The study also detailed the sampling methods and participant selection criteria so others could determine if the findings might transfer to similar populations or settings. Ahmed (2024) observes that documenting each step of the research process ensures transparency and allows others to replicate the study or assess the reliability of the findings. Furthermore, according to Kakar et al. (2023), dependability refers to the consistency of findings over time. Moreover, Eryilmaz (2022) postulates that maintaining an audit trail—a detailed log of decisions made throughout the research—allows other researchers to reproduce the study, ensuring dependable results. Finally, the study ensured confirmability through member checking, giving participants the opportunity to verify that their viewpoints and experiences were accurately represented. Furthermore, Ahmed (2024) postulates that keeping a reflective journal helped to track evolving thoughts, biases, and reflections during the research process. This practice enhanced transparency and provided insights into the researcher's own subjectivity, contributing to the confirmability of the findings.

3.7 Ethical Consideration

The researcher conducted this study by ensuring the protection of human rights through the following guiding principles: dignity, integrity, right to self-determination, privacy, anonymity, beneficence, and confidentiality (Yip et al., 2016). The researcher navigated ethical issues by obtaining consent from the University of Zambia (UNZA), School of Humanities & Social Science Research Ethics Committee under the Directorate of Research and Post Graduate Studies (DGRS). Furthermore, the researcher obtained consent from the institutions and the community participants who consented to participate in the study voluntarily and without coercion. Moreover, the researcher provided an information sheet to the participants to furnish them with more information on the procedures to participate in the research study as well as to withdraw, thus highlighting potential risks.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Increase in Education and Awareness

There is a need to intensify education communication materials and ensure that we always get feedback from the beneficiaries and the service providers. Sanitation is a capital project which requires huge financial injection. Moreover, the houses in the peri-urban areas are not planned; hence, to navigate these settlements, there is a need to work with the local authority because sanitation projects may lead to demolition of some houses, which might trigger compensation to the affected persons. One of the key informants interviewed disclosed that:

> *"We need to intensify the information education communication materials because that's the only way to give sufficient information in terms of prices and feedback, because there hasn't been a room to have a feedback loop when the service provider is not following standard procedures during emptying. We need additional investments*

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to build more sanitation facilities, which always could not reach or given capital investments required. People are now aware about the sanitation model, hence the need to build more toilets and collaborate with the local authority to navigate most of the peri-urban areas in terms of roads and access issues, to do with demolition and compensation, and to increase water provision to the areas due to the direct link between water and sanitation. Invest more in communal sanitation facilities to address open defecation. There are two faecal sludge management facilities, hence there is a need for the central government to construct more of these facilities." (Source: KII- LWSC)

4.1.2 Strengthening of the D-WASH

There are enough sanitation laws, although the main recommendation is to ensure that the D-WASH institutions are strengthened in the peri-urban areas; this will help to ensure compliance. The following is an extraction from one of the key informants:

"Mmm, now, we have enough laws and the only thing that we need to work on is the strengthening of the D-WASH, which are not active. The local authority needs to actively take up this role." (Source: KII-LCC)

4.1.3 Flooding and Pollution Control

There is a need to regularly empty pit latrines when they fill up, because if they are not emptied, climate change–induced flooding tends to move faecal matter into the open environment, affecting shallow wells and thus causing unsanitary conditions. The following is an extraction from one of the key informants:

"*Climate change issues is one of the causes of flooding, hence when toilets are not emptied, pit latrines tend to overflow, causing pollution of the underground water and creating unhealthy environments."* (Source: KII-LCC)

4.1.4 Enforcement, Inspections, and Adherence to Law

The study disclosed that enforcement of sanitation laws is conducted through inspections of premises, especially public premises. The following is an extraction from one of the key informants:

"Lusaka City Council (LCC) also, in terms of enforcement, we also conduct inspections of premises that are just for public places, just to ensure that there is proper sanitation." (Source: KII-LCC)

4.1.5 Limited Access to Sanitation

The study identified critical challenges related to access to clean water, which significantly impacts sanitation in the area. Key informants emphasized the need to prioritize clean water supply, noting that:

"Lack of access to clean water should also be prioritized in the areas." (Participant GC 22)

4.1.6 Improved On-Site Sanitation Infrastructure

The study, through one of the key informants, explained that LWSC has introduced lined pit latrines in peri-urban areas to replace traditional pits that were commonly misused as dumping sites for solid waste. The facilities are designed to allow only sludge to be collected. One respondent stated that the new pit latrines are constructed in a way that:

"Only captures sludge to avoid compromising the structural integrity of the FSTP."

The presence of these new facilities has also influenced behavioural shifts through neighbour demonstration effects. As one informant noted:

"So when neighbours see that the facility is emptiable, they also build it in the same way their neighbour built." This shows that sanitation adoption is strengthened through community-based modelling and imitation.

4.1.7 Scheduled Desludging and Household Participation

Scheduled desludging was introduced to ensure predictable and affordable pit emptying. Households register their pit latrines and make small routine contributions. A key informant described that:

"A customer in the peri-urban area must register that they have a pit latrine; once they register, they pay a small amount towards desludging. So that when the toilet fills up, they just call the service provider."

This system empowers residents and encourages the construction of lined and emptiable toilets. As further noted:

"It brings the peri-urban residents to participate in sanitation service provision." (Source: KII-LWSC 1)

4.1.8 Digitalization of Sanitation Customer Services

Sanitation services have been integrated into LWSC's digital customer service platforms. A key informant reported that:

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"LWSC has gone online, with a call centre, to get payment for service; they have included a component for on-sanitation service, hence bringing the service closer to the customer."

This increases convenience and creates a direct communication channel between households and service providers.

4.1.9 Subsidized Service Delivery

Subsidies were introduced to help service providers and households manage sanitation costs during early implementation. A key informant indicated that:

"What the subsidy did was to cover the losses, since in the initial phase the business is concerned with marketing to raise customer base."

This approach ensured reduced service charges, so that desludging prices were kept at "manageable levels."

4.2 Discussions

4.2.1 Increase in Education

The study revealed the need for awareness and education, and this finding aligns with a study conducted by Cairncross (2003), which avers that laws and regulations are only as effective as the public's knowledge of, and willingness to comply with, them. Hence, behavioural change, household-level hygiene practices, and community engagement are essential complements to formal enforcement mechanisms. Without these educational interventions, regulatory efforts may have limited impact, particularly in peri-urban areas where households face competing priorities and limited resources. Another study highlighted that sanitation is a capital-intensive intervention requiring substantial financial investment. In peri-urban areas where housing is often unplanned, implementing sanitation projects can present additional challenges. According to WaterAid (2013), well-designed education materials, combined with community engagement and feedback mechanisms, improve acceptance, proper usage, and maintenance of sanitation facilities. Integrating communication strategies with technical planning and regulatory compliance ensures that sanitation interventions are both effective and socially sustainable.

4.2.2 Strengthening of the D-WASH

The study highlighted that effective implementation of on-site sanitation in peri-urban areas requires active and well-coordinated community-based water and sanitation structures. Participants emphasized that sanitation cannot be achieved by a single institution, and applying a systems theory perspective helps illustrate the importance of coordinated efforts across multiple actors. The local authority plays a critical role in ensuring that sanitation laws and standards are established and enforced. Simultaneously, regulators monitor utility companies to ensure they comply with licensing conditions, while community stakeholders are responsible for paying for sanitation services and maintaining facilities. Hence, the findings suggest that while the regulatory framework and laws exist, gaps in compliance and coordination often undermine sanitation outcomes. Strengthening District Water, Sanitation, and Hygiene (D-WASH) structures at the community level would enhance oversight, promote adherence to standards, and facilitate collaboration among stakeholders. According to Tidwell et al. (2018), functional community-based structures are essential for sustaining sanitation interventions, particularly in peri-urban settings where service delivery faces logistical, social, and infrastructural challenges. Thus, reinforcing D-WASH institutions is a strategic recommendation that focuses not on creating new laws but on operationalizing and coordinating existing regulations. A strengthened D-WASH framework would ensure greater accountability, improve compliance with sanitation laws, and foster sustainable management of on-site sanitation facilities.

4.2.3 Flooding and Pollution Control

Due to lack of emptying of the pit latrines in most peri-urban areas, overflow occurs during rainy seasons when it floods. The study conducted by Strande et al. (2014) revealed that regular emptying of pit latrines is critical to prevent environmental contamination, particularly in the context of climate change and increased flooding in peri-urban areas. Participants highlighted that when pits are not emptied promptly, flooding can cause faecal matter to overflow into the open environment, contaminating shallow wells and creating unsanitary conditions that pose significant public health risks.

Moreover, the study further revealed that services that operate to empty and transport fecal sludge from on-site sanitation containment systems—without which sludge would be left on-site, pits and septic tanks would overflow, and sludge would not reach treatment or safe disposal sites—are crucial to enable a safely managed sanitation chain. Similarly, a study conducted by Lawrence & Macdonald (2001) highlighted this risk when they reported that most pathogens that affect humans are derived from human waste transmitted by the faecal-oral route and that the transmission may occur through a variety of routes, including food, water, poor personal hygiene, and flies. In Kanyama, as in other parts of the city, residents sell foodstuffs including fruits and meat on the streets, and most of these are not properly covered. Hence, flies can come into contact with these foodstuffs and contaminate them.

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Moreover, Lawrence et al. (2001) reported that where hydraulic loads are high, the liquid part of the waste infiltrates into the soil and represents a hazard to groundwater. Banerjee (2010), in his study, reported that pollution travels from pits in both horizontal and vertical directions and that a minimum travel of pollutants of 2.055 metres was found in clay silt soil, whereas a maximum travel of 10.20 metres was observed in gravel/sand composition of soils in a ten-day period. Furthermore, another study conducted by Dzwairo et al. (2006) noted that the shallow water table increases pollution potential from pit latrines. Used oil has the potential to cause health problems because it produces a pungent smell, which pollutes the air and may lead to residents falling over because it is slippery.

The study also corroborates reviewed literature, which notes that pit latrines in many peri-urban settlements are poorly constructed, often lacking concrete lining or adequate slabs. This inadequate construction facilitates the seepage of faecal matter into groundwater and surrounding soils, further exacerbating environmental and health hazards (Kennedy-Walker et al., 2015). The combination of climate-induced flooding and substandard latrine construction underscores the vulnerability of these communities to waterborne diseases and environmental pollution. These findings suggest that effective faecal sludge management must integrate both technical and behavioural interventions. Properly designed and maintained latrines, regular emptying schedules, and community awareness on sanitation practices are essential to mitigate pollution and reduce the health impacts associated with pit latrines in flood-prone peri-urban areas.

4.2.4 Enforcement, Inspections, and Adherence to Law

The study revealed that one of the primary mechanisms for ensuring compliance with sanitation laws is through systematic inspections of public and private premises. Key informants indicated that these inspections are essential for monitoring adherence to sanitation standards, identifying non-compliance, and initiating corrective actions. Enforcement inspections provide regulators with a tangible way to assess the condition of sanitation facilities and ensure that households and institutions maintain hygienic practices. This finding aligns with existing literature, which emphasizes that regular inspections are a cornerstone of effective sanitation governance. According to Mensah et al. (2023), routine enforcement inspections help detect violations early, reduce the prevalence of unsafe sanitation practices, and reinforce the credibility of regulatory frameworks. Inspections also serve as an opportunity for sensitization, reminding stakeholders of their responsibilities and the health risks associated with poor sanitation. Moreover, when conducted consistently and combined with educational outreach, these inspections can improve compliance, promote proper facility maintenance, and enhance overall public health outcomes in peri-urban communities.

The study further revealed that joint operations among sanitation stakeholders are critical for ensuring compliance with sanitation laws. Participants noted that many District Water, Sanitation, and Hygiene (D-WASH) structures are currently inactive, which limits the ability to monitor and enforce household adherence to sanitation standards. Coordinated enforcement efforts, such as collaborative inspections and community monitoring, are therefore necessary to improve compliance and address gaps in service delivery. This finding is consistent with global literature emphasizing the importance of multi-stakeholder coordination in sanitation governance.

4.2.5 Limited Access to Sanitation

The study revealed that limited access to clean water poses a significant barrier to effective sanitation in peri-urban areas. Participants reported that both men and women experience difficulties in obtaining sufficient water for toilet use, but the burden disproportionately falls on women, who often remain at home while men are at work. The challenge becomes even more pronounced during menstruation, when access to water is critical for hygiene. The study also highlighted that load-shedding and unreliable electricity supply disrupt borehole operations, further limiting water availability and compromising sanitation services.

This finding underscores the interdependence of water and sanitation: inadequate water supply directly affects toilet functionality and the ability to maintain hygienic conditions. According to WaterAid (2013), water scarcity in peri-urban settlements undermines sanitation practices, increases the risk of disease transmission, and exacerbates gendered burdens, as women typically manage household water and sanitation needs. Moreover, these findings suggest that sanitation interventions must integrate water supply planning, paying particular attention to the specific needs of women and other vulnerable groups. Ensuring reliable access to water, including during power outages, is essential to maintain safe and functional sanitation facilities, reduce health risks, and promote equitable access in peri-urban communities.

4.2.6 Improved On-Site Sanitation Infrastructure

The study revealed that the Lusaka Water Supply and Sanitation Company (LWSC) has introduced lined pit latrines in peri-urban areas to improve on-site sanitation infrastructure. Key informants explained that these facilities are designed to replace traditional pit latrines, which were often misused as dumping sites for solid waste, leading to rapid fill-up, unsafe emptying practices, and environmental contamination. The new design allows only sludge to be collected, thereby reducing the risks associated with solid waste mixing and improving the efficiency of pit-emptying services.

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This finding aligns with the literature, which highlights that the introduction of improved pit latrines with proper lining and design features enhances safety, operational efficiency, and public health outcomes in high-density peri-urban settlements (Tomoi et al., 2025). By restricting solid waste from entering the pits, these improvements facilitate safer and faster emptying processes, reduce occupational hazards for pit emptiers, and contribute to sustainable management of on-site sanitation. Overall, upgrading sanitation infrastructure with well-designed, lined pit latrines represents a critical intervention for mitigating environmental contamination, protecting public health, and promoting responsible waste management practices in peri-urban communities.

4.2.7 Scheduled Desludging and Household Participation

The study revealed that the introduction of scheduled desludging has improved predictability and affordability in pit emptying services. Under this system, households register their pit latrines and make small, routine contributions, which enables service providers to plan operations efficiently and reduces the risk of full pits overflowing or being emptied unsafely. This approach promotes household participation, accountability, and cost-sharing, fostering a sense of ownership and responsibility among community members.

This finding aligns with global literature emphasizing that routine and scheduled pit emptying enhances the sustainability of on-site sanitation systems, particularly in peri-urban areas where informal settlements complicate service delivery (Strauss, 2002). Regular contributions by households not only make desludging services financially viable but also reduce the reliance on emergency or ad-hoc emptying, which is often more expensive and less safe. Moreover, scheduled desludging combined with active household participation ensures a more reliable, safe, and cost-effective approach to faecal sludge management. This strategy strengthens community engagement, supports formal service provision, and contributes to improved public health outcomes in peri-urban settlements.

4.2.8 Digitalization of Sanitation Customer Services

The study revealed that sanitation services have been integrated into the Lusaka Water Supply and Sanitation Company's (LWSC) digital customer service platforms. Key informants highlighted that this integration allows households to access sanitation services more conveniently, facilitates reporting of issues, and enhances communication between service providers and beneficiaries. Digital platforms also enable the tracking of service delivery, timely scheduling of pit emptying, and efficient management of customer accounts, improving overall operational efficiency. This finding aligns with global evidence emphasizing the role of digital technologies in enhancing sanitation service delivery. According to Dijk (2012), digitalization in utility services promotes transparency, accountability, and responsiveness, particularly in peri-urban areas where informal settlements and rapid population growth can complicate service provision. Integrating sanitation services into digital platforms ensures that households can actively participate in service planning, monitor desludging schedules, and make payments conveniently, fostering better compliance and satisfaction. Therefore, digitalization strengthens the management, accessibility, and efficiency of sanitation services. By leveraging technology, utilities like LWSC can improve customer engagement, streamline operations, and support sustainable on-site sanitation in peri-urban communities.

4.2.9 Subsidized Service Delivery

The study revealed that subsidies were introduced to support both service providers and households in managing sanitation costs during the early stages of program implementation. Key informants highlighted that these financial incentives significantly reduced the economic burden on households, encouraged timely pit emptying, and promoted participation in formal sanitation services. For service providers, subsidies improved operational feasibility, enabling them to deliver consistent, reliable services while maintaining affordability for residents. This finding is in tandem with global evidence emphasizing the role of subsidies in enhancing access to sanitation in low-income peri-urban communities. According to Dijk (2012), targeted financial support can lower barriers to service adoption, improve compliance with sanitation standards, and encourage the formalization of previously informal services. Subsidies are particularly effective in settings where households face economic constraints that would otherwise delay or prevent the uptake of proper sanitation services. Thus, subsidized service delivery facilitates equitable access, encourages participation in formal sanitation programs, and strengthens the sustainability of on-site sanitation interventions. By reducing financial barriers for both households and service providers, subsidies contribute to improved public health outcomes and environmental protection in peri-urban settlements.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The objective of the paper was to explore the stakeholders' views about sanitation programme implementation in George Compound of Lusaka, Zambia. The study identified measures to address sanitation challenges, including the introduction of lined pit latrines, faecal sludge treatment plants, scheduled desludging, digital customer service

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platforms, and subsidies for households and service providers. Emphasis on education, cultural socialization, gender inclusion, and the adoption of a human rights approach were highlighted as critical strategies to promote behavioural change, awareness, and equitable participation. Applying the systems theory lens, the study underscores that sanitation is not a standalone service but a complex system involving interdependent actors, including regulators, utility companies, service providers, and community stakeholders. Coordinated efforts across these actors are essential for sustainable sanitation outcomes. The study objective was to explore the stakeholders' views about sanitation programme implementation in George Compound of Lusaka, Zambia.

5.2 Recommendations

5.2.1 Government through NWASCO

There is a need for realignment of the licensing regime for on-site sanitation to a single sanitation license. Currently, there are multiple permits and licenses required by on-site sanitation service providers to operate in different jurisdictions not covered by the license. Furthermore, there is a need to ensure that the sanitation players are coordinated to avert fragmentation of roles, and to formalize community stakeholders' bottom-up regulatory enforcement of on-site sanitation.

5.2.2 Water and Sanitation Utility Companies

Integrate solar-powered lighting in the pit latrines constructed under the project to optimize night-time safety during load-shedding. Furthermore, there is a need to incorporate residents and artisans at each stage of toilet design and siting to prevent pit depth problems and shallow lining failures. Additionally, there is a need to intensify community sensitization programs on preventing vandalism, misuse, and unauthorized design changes, which were highlighted as major implementation setbacks in the study.

5.2.3 Community Stakeholders

Conduct community sensitisation programmes against vandalism of the sanitation infrastructure in the peri-urban areas. Moreover, there is a need for community stakeholders to coordinate with service providers and regulators to ensure community participation in sanitation services.

Declaration of Interest

The author declares that she does not have any known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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REFERENCES

AfDB. (2015). *Lusaka Sanitation Program-climate resilient sustainable infrastructure-ESMF summary*. African Development Bank.

African Union. (2015). Agenda 2063: The Africa we want. African Union Commission.

Ahmed, S. K. (2024). The pillars of trustworthiness in qualitative research. *Journal of Medicine, Surgery, and Public Health*, 2, 100051. https://doi.org/10.1016/j.glmedi.2024.100051

Akhter, S. (2022). Key informants' interviews. In M. R. Islam, N. A. Khan, & R. Baikady (Eds.), *Principles of social research methodology* (pp. 389–403). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-5441-2_27

Arias-Gómez, J., Villasís-Keever, M. Á., & Miranda-Novales, M. G. (2016). El de investigación III: la población de estudio. *Revista Alergia México*, 63, 201–206. https://doi.org/10.29262/ram.v63i2.181

Banerjee, T. G. (2010). Pit latrines and their impacts on groundwater quality. [Online]. Retrieved from https://www.researchgate.net/publication/236070782_Pit

Brown, J., Albert, J., & Whittington, D. (2019). Community-led total sanitation moves the needle on ending open defecation in Zambia. *The American Journal of Tropical Medicine and Hygiene*, 100, 767–769.

Brown, N., Nemcik, J., & Petti, M. (2012). Sanitation master plan for Lusaka, Zambia. In *Proceedings of the Water Environment Federation* (2012, Issue 13, pp. 3266–3289). https://doi.org/10.2175/193864712811726969

Cairncross, S. (2003). Sanitation in the developing world: Current status and future solutions. *International Journal of Environmental Health Research*, 13(Suppl 1), S123–S131. https://doi.org/10.1080/0960312031000102886

Chipuwa. (2019). The status of water and sanitation in newly planned residential areas in Lusaka: A case of Kwamwena Valley in Lusaka.

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Cresswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Sage.

Dijk, (2012). GTZ Sanitation Project in Koulikoro, Mali. GTZ.

Dzwairo, B. R., Hoko, Z., Love, D., & Guzha, E. (2006). Assessment of the impacts of pit latrines on groundwater quality in rural areas: A case study from Marondera district, Zimbabwe. *Physics and Chemistry of the Earth, Parts A/B/C, 31*(15), 779–788. https://doi.org/10.1016/j.pce.2006.08.031

ECA. (2018). Pit-emptying practices in Lusaka: How to encourage households to use safer and more environmentally friendly services. https://www.eca-uk.com/2018/06/21/pit-emptying-practices-in-lusaka-how-to-encourage-households-to-use-safer-and-more-environmentally-friendly-services

Eryilmaz, Ö. (2022). Are dissertations trustworthy enough? The case of a Turkish PhD. Dissertations on social studies education. *Participatory Educational Research*, 9, 344–361. https://doi.org/10.17275/per.22.70.9.3

Gerring, J. (2004). What is a case study and what is it good for? *American Political Science Review*, 98, 341–354. https://doi.org/10.1017/S0003055404001182

Howard, G. (2021). The future of water and sanitation: Global challenges and the need for greater ambition. *Journal of Water Supply: Research and Technology-Aqua*, 70, 438–448. https://doi.org/10.2166/aqua.2021.127

Kakar, Z. U. H., Rasheed, R., Rashid, A., & Akhter, S. (2023). Criteria for assessing and ensuring the trustworthiness in qualitative research. *International Journal of Business Research*, 4, 150–173. https://doi.org/10.56249/ijbr.03.01.44

Kennedy-Walker, R., Amezaga, J. M., & Paterson, C. A. (2015). The role of power, politics and history in achieving sanitation service provision in informal urban environments: A case study of Lusaka, Zambia. *Environment and Urbanization*, 27(2), 489–504. https://doi.org/10.1177/0956247815583253

Kiger, M. E., & Varpio, L. (2020). Thematic analysis of qualitative data: AMEE Guide No. 131. *Medical Teacher*, 42, 846–854. https://doi.org/10.1080/0142159X.2020.1755030

Kivunja, C., & Kuyini, A. B. (2017). Understanding and applying research paradigms in educational contexts. *International Journal of Higher Education*, 6, 26. https://doi.org/10.5430/ijhe.v6n5p26

Lawrence, A. R., Macdonald, D. M. J., Howard, A. G., Barrett, M. H., Pedley, S., Ahmed, K. M., & Nalubega, M. (2001). *Guidelines for assessing the risk to groundwater from on-site sanitation* (British Geological Survey, Report No. CR/01/142N, 103 pp., Unpublished report).

Lerebours, A., Scott, R., Sansom, K., & Kayaga, S. (2021). Regulating sanitation services in sub-Saharan Africa: An overview of the regulation of emptying and transport of faecal sludge in 20 cities and its implementation. *Utilities Policy*, 73, 101315. https://doi.org/10.1016/j.jup.2021.101315

Mensah, J., Mattah, P. A. D., Amoah, J. O., & Mattah, M. M. (2022). Public compliance with environmental sanitation regulations in Ghana. *Open Health*, 3(1), 1–12. https://doi.org/10.1515/openhe-2022-0001

National Rural Water Supply and Sanitation Program. (2006). National Water Supply and Sanitation Council (NWASCO), Lusaka, Zambia.

National Water Supply and Sanitation Council. (2018). Urban onsite sanitation and faecal sludge management framework for provision and regulation in Zambia. https://www.susana.org/_resources/documents/default/3-3327-7-1530187197.pdf

Osborne, N., & Grant-Smith, D. (2021). In-depth interviewing. In S. Baum (Ed.), *Methods in urban analysis, Cities Research Series* (pp. 105–125). Springer Singapore. https://doi.org/10.1007/978-981-16-1677-8_7

Peprah, D., Baker, K. K., Moe, C., Robb, K., Wellington, N., Yakubu, H., & Null, C. (2015). Public toilets and their customers in low-income Accra, Ghana. *Environment and Urbanization*, 27, 589–604. https://doi.org/10.1177/0956247815595918

Rajapakse, J., Otoo, M., & Danso, G. (2023). Progress in delivering SDG6: Safe water and sanitation. *Cambridge Prisms Water*, 1, e6. https://doi.org/10.1017/wat.2023.5

Robinson, R. S. (2014). Purposive sampling. In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 5243–5245). Springer Netherlands. https://doi.org/10.1007/978-94-007-0753-5_2337

Scotland, J. (2012). Exploring the philosophical underpinnings of research: Relating ontology and epistemology to the methodology and methods of the scientific, interpretive, and critical research paradigms. *English Language Teaching*, 5(9), 9. https://doi.org/10.5539/elt.v5n9p9

SNV. (2024). Advancing sanitation governance in Zambia: A snapshot of the strengthened regulations for onsite sanitation and faecal sludge management. https://www.snv.org/assets/downloads/f/191310/x/477d30c695/2024-advancing-sanitation-governance-zm-snv.pdf

Strande, L., Ronteltap, M., & Brdjanovic, D. (2014). *Faecal sludge management: Systems approach for implementation and operation*. IWA Publishing.

Strauss, D. F. M. (2002). The scope and limitations of Von Bertalanffy's systems theory. *South African Journal of Philosophy*, 21(3), 163–179. https://doi.org/10.4314/sajpem.v21i3.31343

Suri, H. (2011). Purposeful sampling in qualitative research synthesis. *Qualitative Research Journal*, 11, 63–75.

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Tidwell, J. B., Chipungu, J., Chilengi, R., & Aunger, R. (2018). Assessing peri-urban sanitation quality using a theoretically derived composite measure in Lusaka, Zambia. *Journal of Water, Sanitation and Hygiene for Development*, 8, 668–678.

Tomoi, H., Ingumba, B. B., Simiyu, S., Otteng, E., Osewe, J., Majiwa, H., Braun, L., Cumming, O., & Moriyasu, T. (2025). Barriers and enablers for group-based manual emptying services for onsite sanitation facilities in Nairobi, Kenya: A qualitative study. *International Journal of Hygiene and Environmental Health*, 267, 114595. https://doi.org/10.1016/j.ijheh.2025.114595

United Nations General Assembly. (2010). The human right to water and sanitation (108th Plenary Meeting).

United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. https://sdgs.un.org/2030agenda

WaterAid. (2013). Living conditions and sanitation crisis in Chainda Shanty Compound, Zambia.

WHO/UNICEF. (2017). *Annual report: WHO/UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene (JMP)*.

WHO/UNICEF. (2021). *Progress on household drinking water, sanitation and hygiene 2000–2020: Five years into the SDGs*. Geneva.

Wilkinson, L. A. (2011). Systems theory. In S. Goldstein & J. A. Naglieri (Eds.), *Encyclopedia of child behavior and development* (pp. 1466–1468). Springer US. https://doi.org/10.1007/978-0-387-79061-9_941

Yip, C., Han, N.-L., & Sng, B. (2016). Legal and ethical issues in research. *Indian Journal of Anaesthesia*, 60(9), 684. https://doi.org/10.4103/0019-5049.190627

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Remedial program management practices and transition rates in public day secondary schools in Bugesera district, Rwanda

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ABSTRACT

This study aims to assess the influence of remedial program management practices on transition rates in public day secondary schools in Bugesera District, Rwanda. The study was guided by four specific objectives, which were to explore the influence of resource allocation on transition rates in public day secondary schools in Bugesera District, Rwanda; to assess the effect of technology integration on transition rates in public day secondary schools in Bugesera District; to examine the influence of stakeholders' involvement on transition rates in public day secondary schools in Bugesera District; and to examine the influence of supervision of remedial programs on transition rates in public day secondary schools in Bugesera District. Educational Management Theory and Constructivist Learning Theory guided the study. A descriptive survey with a mixed-methods approach, integrating both quantitative and qualitative methods, was adopted to gather perceptions from a total population of 2,144, including 46 head teachers, 46 deputy head teachers, 330 teachers, and 1,722 remedial students. A sample size of 337 respondents was calculated using Solvin's formula. The sample size included 7 head teachers, 7 deputy head teachers in charge of studies, 52 teachers, and 271 remedial students selected from 46 public day secondary schools in Bugesera District. Schools were selected first through simple random sampling, then headteachers and deputy headteachers were selected through purposive sampling, while teachers and remedial students were selected through simple random sampling. The study collected data from teachers using questionnaires, while interview guides were used to collect data from head teachers and deputy head teachers in charge of studies, and focus group discussions were conducted with remedial students. A reliability index of at least 0.7 was used as the benchmark to determine the reliability of the questionnaire, and a validity test was conducted with an acceptable threshold of 0.6. To analyze the data, quantitative analysis was conducted using SPSS to calculate the mean, standard deviation, and frequency distribution, and a regression analysis was applied to test the hypothesis, while qualitative analysis was conducted through thematic coding. The study revealed that resource allocation ($R^2 = 0.017$, $p = 0.357$) did not have a statistically significant influence on transition rates, whereas technology integration ($R^2 = 0.124$, $p = 0.010$), stakeholder involvement ($R^2 = 0.185$, $p = 0.001$), and supervision of remedial programs ($R^2 = 0.260$, $p = 0.000$) all positively and significantly influenced transition rates in public day secondary schools in Bugesera District. The study concludes that supervision of remedial programs had the highest significant influence on transition rates. It recommends that the Ministry of Education should strengthen policies on structured supervision and capacity-building, urges school leaders to enhance monitoring, feedback, and early interventions, and suggests further research on long-term effects, leadership sustainability, early identification strategies, and teacher professional development in remedial programs.

Keywords: Academic Performance, Educational Management, Remedial Programs, Transition Rates

I. INTRODUCTION

Education plays an essential role to the advancement of people and society because it opens doors to social inclusion, economic success and personal development. Education is acknowledged widely as a basic human right that is necessary to accomplish sustainable development objectives (McCowan, 2013). Globally, education systems strive to improve economic mobility, promote social cohesion, and give students the skills for their modern need (Camilleri, 2016). Despite these significances, a number of countries still struggle with issues that impair student achievement and the successful implementations of educational programs (Ankomah, 2005). One of the persistent challenges, particularly in developing countries, is low student transition rates, where students repeat grades due to insufficient academic progress, leading to delayed educational progression, increased dropout rates and emotional stress (Tarekegne, 2015).

To address this challenge, remedial programs have been implemented to support struggling students in Rwanda (Rwanda Education Board [REB], 2020). These initiatives aim to upgrade the quality of education and lower the likelihood of school dropout and close learning gaps. This intervention has worldwide proven to be significant to enhance academic performance. For instance, after-school tutoring programs in language arts and mathematics have improved student outcomes in the United States (Allen, 2016). In Greek, implementation remedial program improved academic success helping 70% of students attended this program to achieve better academic performance

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(Papadogiannis, 2023). Countries like Japan have the same approach. They emphasize personalized learning plans and collaborative problem-solving. Most importantly, they have rigorous teacher training to make remedial programs effective and the study of (Bessho, 2019) indicated that the remedial education programs had positive effects on test scores of Japanese language arts by 0.13 of a standard deviation. In some countries in Sub-Saharan Africa like Tanzania, remedial education is part of the national framework. Local strategies include peer mentoring and training of head teachers to monitor intervention programs (Kalyoma, 2016).

In Rwanda, extra assistance is being given as a way to lessen these challenges so that Rwandan students can do better. In Bugesera District among others, the success of remedial program is hampered by includes the low level of students' English, and the short time devoted to remedial teaching while some teachers still see it as a time-consuming process (Nshimiyimana, 2023). The failure of students in Bugesera in subjects like Mathematics and languages is because of these gaps which lead to repetition. Some institutions have introduced remedial interventions, yet these programs are often fragmentary, under-resourced or inconsistently applied, thus limiting their possible impact on transition rates.

1.1 Statement of the Problem

According to the ministry of education (MINEDUC, 2022) although the enrollment rate is high, only 46% transition to secondary education, with numbers declining as students' progress through the system whereas the repetition rates increased from 8.3% to 14.3% in Rwanda, including Bugesera District. This decline in transition rates coupled with the increase of dropout rate for public day secondary schools, leads to education challenges. Even with the initiatives to improve retention and progression through remedial program, we see that many students do not actually progress smoothly and instead fail to move from one grade to another, which has an impact on overall school effectiveness. The low transition rates of students to secondary education have been due to poor management of remedial programs.

This issue poses not only educational challenges but also countries economy. According to According to the United Nations International Children's Emergency Fund (UNICEF, 2023) report, "The Impact of Remedial Education in Rwanda," high levels of student dropout and grade repetition placed a significant burden on the country's resources where each year, around 10% of learners dropped out and another 10% repeated grades consumed nearly one-fifth of the national education budget equivalent to about 3% of the overall national budget, with each student who failed to complete primary school losing RwFs 6.1 million in potential lifetime earnings, contributing to a national loss of approximately RWF 2.9 trillion in 2021 alone.

Furthermore, low transition rates limit students' access to higher levels of education, reduce their future employment prospects. This educational setback exacerbates social inequality and undermines Rwanda's goal of achieving inclusive and quality education as outlined in the Vision 2050 and ESSP ((MINEDUC)., (n.d.).). Without effective remedial program management, students remain unsupported in overcoming academic difficulties, perpetuating cycles of poor performance and school failure that threaten both individual futures and national development objectives.

1.2 Research Objectives

i. To assess the influence of resource allocation on Transition rates in public day secondary schools in Bugesera district, Rwanda.
ii. To assess the effect of technology integration on Transition rates in public day secondary schools in Bugesera district.
iii. To evaluate the influence of stakeholder's involvement on Transition rates in public day secondary schools in Bugesera district.
iv. To examine the influence of supervision of remedial program on Transition rates in public day secondary schools in Bugesera district.

II. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Educational Management Theory

Educational Management Theory developed by Okumbe (1998), emphasizes the organized and purposeful processes through which educational institutions plan, structure, lead, coordinate, and regulate activities and resources in order to attain improved learning outcomes. Applied to public secondary education, the theory serves as a relevant analytical framework for examining how leadership and management practices shape the effectiveness of remedial teaching initiatives. It directly corresponds with the independent variables guiding this study namely, resource distribution, integration of technological tools, engagement of key stakeholders, and oversight of remedial activities all of which are central to enhancing student achievement in public schools. Argues that educational management within

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public institutions is marked by deliberate strategic choices, judicious utilization of limited resources, and participatory leadership that cultivates collaboration among stakeholders. These dimensions are of particular importance in Rwanda's public secondary school system, where constrained resources and increasing enrolment levels pose significant managerial demands. In relation to resource allocation, the theory highlights the necessity of ensuring equitable access to instructional materials and sufficient teaching personnel. Moreover, in contexts where accountability pressures are considerable, rigorous supervision becomes essential to guarantee that remedial programmes remain aligned with institutional priorities and are executed effectively.

2.1.2 Constructivist Learning Theory

Constructivist Learning Theory, formulated by Amineh.and Asl (2015), maintains that learners develop understanding by actively engaging with experiences, reflecting on them and interacting with their surroundings. This theoretical perspective is closely linked to the dependent variable of this study as it underscores the role of meaningful learning in reducing grade repetition and school dropout. Within the context of public secondary schools in Rwanda, low transition rates frequently signal a mismatch between pedagogical practices and students' unique learning needs. The theory states that when instructional practices fail to stimulate learners in ways that correspond with their learning preferences, students are more inclined to fall behind academically and move to subsequent grades without adequate mastery of essential competencies. In numerous public secondary schools, remedial teaching remains grounded in conventional, teacher-centered approaches that neither fully engage learners nor sufficiently address individual learning needs where personalized support is limited. Based on the constructivist perspective, when remedial instruction neglects learner-centered methods that allow students to assume responsibility for their learning, internalize content, contributes to persistently low transition rates.

2.2 Empirical Review

2.2.1 Resource Allocation and Transition Rates

Resource allocation has been identified as one of the major influences on student's performance. The study of Ouma (2024), in Kenya, reported that the schools with adequate resources allocation across teaching and learning materials, spaces, sports equipment and sanitation facilities demonstrated the highest transition and promotion rates. Similar results were documented by Bettinger et al. (2013) in united states, who revealed that the limited resources of institutions and equally limited funds of students make it imperative for postsecondary institutions to improve student academic supports and other services. The study of Kirimi (2016) reported that the schools which introduced school feeding programs enhanced retention of students there by decreasing dropout rate. Evidence from Kenya also supports these findings. Musyoka (2013) reported that schools with inadequate physical facilities such as classrooms, laboratories, library, desks and toilets negatively impacted on student academic performance. (Akpalu, 2025) added that in Ghana, lack of adequate teaching and learning materials hinders effective instruction, particularly in rural schools and suggested that where materials are perceived as adequate, teachers are likelier to adopt more engaging methods, which tends to improve learning outcomes. The way resources are managed financially also matters greatly. Collectively, these studies show that resource allocation matters not only in terms of availability, but also in the fairness, strategy and care with which resources are managed and this management plays a central role in improving student transition rates.

2.2.2 Technology Integration and Transition Rates

Technology integration is increasingly recognised as a valuable approach to strengthening student learning. For instance, empirical cross-country analysis using school-level data by (Cristia, J., Czerwonko, A., & Garofalo, P, 2014) finds that increased access to computers and connectivity can reduce repetition and dropout but effects depend on teacher training and how technology is used not just presence of devices. Comparable findings appeared in Nigeria, where (Cut, 2023) found a significant effect of e-learning based remedial learning on the topic of fraction on learning outcomes in junior high schools in Indonesia. In Denmark, (Lassesen, B., Stenalt, M. H., Rossen, D. S., & Bager-Elsborg, A, 2019) found positive associations between active, well-designed technology use and lower dropout rates. Molotsi, A., & van Wyk, M. (2024) in South Africa further demonstrated that the lack of Technological Pedagogical Knowledge by teachers disconnected them from actual teaching practices and eventually hinders them to achieve specific learning objectives. In addition, (Upadhyay et al., 2021) in Kenya found the Video lessons created by experienced teachers and distributed through an EdTech remedial program helped learners in low-resource settings access higher-quality instruction and supported catch-up learning. Collectively, these studies indicate that technology can meaningfully enhance teaching practices and student progression thereby increasing transition rates.

2.2.3 Stakeholder Involvement and Transition Rates

Stakeholder involvement particularly the engagement of parents, teachers and the wider community is widely acknowledged as a factor for influencing student performance in secondary schools. Smith, J. S., Akos, P., Lim, S., & Wiley, S. (2008) study in united states revealed that schools with strong parental participation recorded higher transition

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rates, as parents provided academic support at home and collaborated with teachers in monitoring student progress. Similar evidence was reported by (Mwinyi, 2024) in Tanzania, highlighted the crucial parental practices in enhancing student retention, emphasizing the need for strategic interventions to foster such engagement. Lema, P. R., & Mwila, P. M. (2022) in Tanzania further demonstrated that building a good relationship between school organizations and community members is vital and should be endeavoured for desired quality education results in public secondary schools. (Kabitina, 2024) observed that the findings revealed that parents facilitated children's home learning environment through tracking children's academic progress, allocating study time at home and maintaining discipline enhanced their student performance. (Ndwandwe, 2023) in South Africa found that parental involvement in secondary schools was associated with improved learner discipline and achievement though it also noted significant barriers to effective involvement; lack of confidence to help with homework, scheduling conflicts, weak communication. Likewise, (Olaifa, 2024) in Nigeria reported the significant positive relationship between teacher-parent association(PTA) intervention strategies and goal achievement in public secondary schools. Collectively, these studies suggest that formal participation structures, such as PTAs, hold significant potential for enhancing stakeholder engagement, although their success depends on meaningful involvement and informed collaboration.

2.2.4 Supervision of Remedial Programs and Transition Rates

Supervision of remedial programs is widely acknowledged as a key factor in ensuring their success and in supporting higher student transition rates in secondary schools. Research by (Lavy, 2005) evaluated the importance of program supervision and fidelity for achieving effect sizes in Israel, the study revealed improved outcomes among the targeted students as results of effective program supervision. Similarly, the study of (Nzayisenga, 2025) in Rwanda, reported a strong positive relationship between instructional supervision and student performance. The correlation coefficient was R = 0.705; and their regression model showed that instructional supervision accounted for about 49.7% of the variance in student academic outcomes. (Mensah, 2022) in Ghana reported that The study also indicated that there is high level of impact of monitoring and supervision on Junior High Schools' curriculum implementation. (Urio, 2018) in Tanzania also highlighted that schools with regular and active instructional supervision tended to perform better academically; by contrast, schools lacking supervision often had weaker performance. Taken together, these studies underscore that both the frequency and quality of supervision play a critical role in the effectiveness of remedial programs, supporting its inclusion as a central variable in this study.

III. METHODOLOGY

3.1 Research Design

The study employed a descriptive survey design, which was appropriate for systematically observing, documenting and interpreting existing conditions without manipulating any variables. The study adopted a mixed-methods research methodology integrating both quantitative and qualitative approaches. Qualitative data was collected using interviews from head teachers and deputy head teachers in charge of studies and focused group discussion was used to collect qualitative data on students' engagement, learning outcomes, and the perceived effectiveness of support received. Structured questionnaires were administered to teachers to collect quantitative data on instructional practices, availability and use of remedial resources, perceptions of the effectiveness of remedial strategies, and challenges encountered in program implementation. This design enabled the researcher to assess the current state of remedial program management practices, such as instructional supervision, the use of ICT in remedial teaching, resource allocation, and stakeholder involvement, and examine their relationship with student transition rates.

3.2 Target Population

This study focused on the perspectives of key participants drawn from a total population of 2,144 individuals, comprising 46 head teachers, 46 deputy head teachers in charge of studies (DOSs), 330 teachers, and 1,722 remedial students from public day secondary schools in Bugesera District, Rwanda.

3.3 Sample Size and Sampling Techniques

3.3.1 Sample Size

Solvin's formula was used to determine the sample size of teachers, school administrators and students,

$$n = \frac{N}{1 + Ne^2}$$

Where:

n = Required sample size
N = Total population size
e = Margin of error (set at 0.05 for a 95% confidence level)

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Table 1

Sample Size

Population Category	Target Population	Sample Size
Head teachers	46	7
DOSs	46	7
Teachers	330	52
Remedial Students	1722	271
Total	**2144**	**337**

3.3.2 Sampling Techniques

Schools were selected first through simple random sampling then headteachers and deputy head teachers were selected through purposive sampling while teachers and remedial students were selected through simple random sampling. Head teachers and deputy head teachers in charge of studies were selected purposively due to their strategic leadership roles and specialized knowledge in the management and supervision of remedial programs. Their perspectives were essential in understanding institutional practices, decision-making processes, and the effectiveness of remedial program management in addressing student transition. Simple random sampling was applied to select teachers and remedial students, ensuring that every individual within these groups had an equal chance of being selected, minimizing selection bias and enhancing the representativeness of the sample.

3.4 Research Instruments

The study employed multiple research instruments to collect both quantitative and qualitative data, ensuring a comprehensive understanding of remedial program management practices and their influence on student transition rates.

Structured questionnaires were used to collect quantitative data on instructional practices, availability and use of remedial resources, perceptions of the effectiveness of remedial strategies, and challenges encountered in program implementation. The questionnaires were designed with both closed-ended and Likert-scale items to facilitate statistical analysis while capturing teachers' experiences and perceptions. Semi-structured interview guides were used to collect qualitative data from head teachers and deputy head teachers in charge of studies and Focus group discussions (FGDs) were conducted with remedial students to understand their experiences, perceptions, and challenges related to remedial programs.

3.5 Validity of Research Instruments

Validity ensured that the instruments accurately measured what they were intended to assess. Content and construct validity were emphasized, with a minimum acceptable threshold set at 0.6. Construct validity was evaluated using factor analysis to determine whether questionnaire and interview items accurately reflected the theoretical constructs of the study. Items with factor loadings below 0.6 were reviewed, revised, or removed. Feedback from the pilot study helped identify ambiguities and gaps, ensuring that the instruments effectively captured key aspects of remedial program management and student transition rates.

3.6 Reliability of Research Instruments

Reliability was established through a pilot test and statistical analysis. The Cronbach's Alpha test was applied to assess internal consistency of the structured questionnaires. A coefficient of 0.7 or higher was considered acceptable, indicating that the questionnaire items consistently measured the intended constructs across different samples. The pilot also provided insights into the clarity of instructions, appropriateness of question formats, and feasibility of the data collection process. Adjustments were made based on pilot feedback to strengthen the consistency and dependability of the instruments.

3.7 Data Collection Procedure

Data were collected using both quantitative and qualitative approaches in a systematic and coordinated manner. Quantitative data were obtained through structured questionnaires administered to teachers, capturing measurable information on remedial program practices such as resource allocation, technology use, instructional supervision, and stakeholder involvement. Qualitative data were collected through semi-structured interviews with head teachers and deputy head teachers, as well as focus group discussions with remedial students. These qualitative methods provided in-depth insights into the experiences, perceptions, and challenges associated with the implementation of remedial programs. The combination of these methods enabled methodological triangulation, ensuring that the data collected were comprehensive, corroborative, and reflective of the complex dynamics influencing student transition rates in public day secondary schools in Bugesera District.

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3.8 Data Analysis

For the quantitative analysis, SPSS software was used for descriptive statistics, including the calculation of mean, percentage, frequency, and standard deviation. These measures provided a clear overview of the data distribution and central tendencies in public day secondary schools in Bugesera District. Additionally, inferential statistics were applied through regression analysis to examine the relationships between variables and to make predictions based on the data. Specifically, the multiple linear regression model was used to understand the influence of remedial program management strategies on transition rates in public day secondary schools in Bugesera District.

The researcher also employed a thematic analysis approach to analyze the qualitative data collected from interviews. This method involved systematically identifying, organizing and interpreting patterns or themes that emerged from the data, providing a rich and nuanced understanding of participants' experiences and perspectives. By analyzing the experiences of respondents, the researcher uncovered how remedial program management practices influenced transition rates in public day secondary schools in Bugesera District.

3.6 Ethical Consideration

The study adhered to ethical standards outlined by Mount Kigali University and in accordance with Rwanda's Data Protection Law (No. 058/2021 of 13/10/2021). To gain access to the selected public secondary schools in Bugesera District, the researcher obtained an authorization letter from district education authorities. Before involving, the participants participated voluntarily. For confidentiality and privacy of all participant, the Data collected were used only for research purposes and were not disclosed to any unauthorized parties. The researcher used anonymous questionnaires and code systems rather than names or personal references during data collection and analysis, to prevent individual identification. To uphold academic honesty, the research report was screened for plagiarism using TURNITIN software.

IV. FINDINGS & DISCUSSION

4.1 Demographic Characteristics

4.1.1 Gender of Respondents

To evaluate the influence of remedial program management practices and transition rates in public day secondary schools in Bugesera district, Rwanda, the study set out to determine the gender profile of respondents.

Table 2

Gender of Respondents

Gender	Teachers		HTs		DOSs		Students	
Males	27	51.9	5	71.4	4	57.1	78	23.1
Females	25	48.1	2	28.6	3	42.9	193	57.2
Total	52	100	7	100	7	100	337	100

The results from the study show varied gender distributions across the categories of respondents. Among the 52 teachers, 27 (51.9%) were male while 25 (48.1%) were female, indicating a balanced gender representation in the teaching workforce of public day secondary schools in Bugesera District. In contrast, the seven head teachers comprised five males (71.4%) and two females (28.6%), suggesting a male-dominated leadership at the headship level. Similarly, among the seven Directors of Studies (DOSs), four (57.1%) were male and three (42.9%) were female, showing a slight male majority. However, the student population of 337 revealed a different pattern, with 193 females (57.2%) and 78 males (23.1%), highlighting a higher female representation among learners. This distribution suggests that while teaching staff are almost equally represented by gender, leadership positions at the headship and DOS levels remain more male-dominated. On the other hand, the predominance of female students underscores the importance of tailoring remedial program management practices to address the needs of both genders equitably. Balanced gender participation among teachers and DOSs provides opportunities for diverse perspectives in teaching and learning, as well as in managing remedial programs that support student transition rates.

4.1.2 Respondents' Age Distribution

The maturity was a considerable research construct as it helped to ensure the maturity of responses enabled the researcher to ensure data credibility that is vital in the current study.

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Table 3
Age of Teachers

Age range	Frequency	Percentage
21-30	28	53.8
31-40	15	28.8
41-50	9	17.3
Total	52	100

The results show that most teachers in public day secondary schools in Bugesera District fall within the age range of 21–30 years (53.8%), followed by those aged 31–40 years (28.8%), while the smallest proportion is in the 41–50 years range (17.3%). This indicates that the teaching workforce in Bugesera is predominantly young, suggesting both opportunities and challenges for remedial program management. On one hand, younger teachers often bring innovation, energy and openness to adopting modern pedagogical strategies such as technology integration in remedial teaching. On the other hand, their limited professional experience may hinder effective supervision and holistic resource utilization, which are essential for sustaining higher student transition rates. the relatively smaller number of older teachers could also mean fewer mentors available to guide less experienced staff in implementing remedial programs effectively, a gap that may affect continuity and long-term impact.

4.1.3 Education Level of Respondents

The researcher through questionnaires has requested respondents to indicate their higher level of qualification.

Table 4
Education Level of Teachers

	Teachers		HTs		DOSs	
Level of Education	**N**	**%**	**N**	**%**	**N**	**%**
Bachelor in Education	48	92.3	7	100	7	100
Advanced degree in Education	4	7.6	0	0	0	0
Total	52	100	7	100	7	100

The findings reveal that most teachers (92.3%) in public day secondary schools in Bugesera District possess a bachelor's degree in education, while only 7.6% hold advanced qualifications. All head teachers and directors of studies, however, have attained at least a bachelor's degree in education. Although this reflects compliance with the minimum professional requirements, the limited presence of advanced qualifications among teachers may limit the depth and effectiveness of remedial program management. As (Hightower, A. M., Delgado, R. C., Lloyd, S. C., Wittenstein, R., Sellers, K., & Swanson, C. B, 2011) emphasizes, highly qualified teachers contribute significantly to enhancing student performance and transition rates. Therefore, while the district demonstrates a solid foundation of professionally trained staff, fostering advanced training and continuous professional development remains essential for strengthening remedial program management and improving student transition outcomes.

4.2 Findings on the Influence of Resource Allocation on Transition Rates

To assess the influence of resource allocation on transition rates, participants were asked to provide responses via a questionnaire. This was achieved through using a five-point Likert scale, ranging from strongly agree to strongly disagree, to quantify the perceptions of respondents.

Table 5
Teachers Responses on the Influence of Resource Allocation on Transition Rates

Statements	**SD (N, %)**	**D (N, %)**	**N (N, %)**	**A (N, %)**	**SA (N, %)**	**Mean**	**Std**
The school allocates adequate teaching materials to support learners.	1 (1.9)	0 (0.0)	0 (0.0)	37 (71.2)	14 (26.9)	4.2308	0.54648
There are sufficient classrooms and facilities to enhance learning.	0 (0.0)	0 (0.0)	0 (0.0)	52 (100.0)	0 (0.0)	4.0000	0.00000
Funds are allocated for programs targeting students who are academically weak.	0 (0.0)	0 (0.0)	1 (1.9)	37 (71.2)	14 (26.9)	4.2500	0.47999
The school provides enough learning resources for all students.	0 (0.0)	0 (0.0)	0 (0.0)	27 (51.9)	25 (48.1)	4.4808	0.50450
Proper budgeting for academic support programs is prioritized.	0 (0.0)	0 (0.0)	0 (0.0)	25 (48.1)	27 (51.9)	4.5192	0.50450
The distribution of resources is based on student needs.	1 (1.9)	0 (0.0)	0 (0.0)	24 (46.2)	27 (51.9)	4.4808	0.61006

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The results in above table indicate that a substantial majority of teachers perceive the school as providing adequate teaching materials to support student learning. Specifically, 71.2% of teachers agreed and 26.9% strongly agreed that sufficient materials were allocated, while only 1.9% strongly disagreed, yielding a mean of 4.23 and a standard deviation of 0.55. This suggests that most students benefit from adequate learning resources, which are critical for effective remedial instruction, although minor disparities in availability may occasionally limit program effectiveness.

Similarly, 71.2% of teachers agreed and 26.9% strongly agreed that funds were allocated to support academically weaker students, with 1.9% remaining neutral (mean = 4.25, SD = 0.48). These findings suggest that targeted financial support is generally perceived to be in place, enhancing students' access to remedial materials and additional academic assistance. Additionally, 51.9% of teachers agreed and 48.1% strongly agreed that learning resources were sufficient (mean = 4.48, SD = 0.50), indicating that students are generally well-equipped for remedial learning, though ongoing monitoring remains important to maintain adequacy.

Regarding budgeting practices, 48.1% of teachers agreed and 51.9% strongly agreed that proper budgeting for academic support programs exists (mean = 4.52, SD = 0.50). This reflects the perception that remedial programs are financially structured to operate effectively and provide continuous support to students in need. Furthermore, 46.2% of teachers agreed and 51.9% strongly agreed that resources were distributed based on student needs, with only 1.9% strongly disagreeing (mean = 4.48, SD = 0.61). This indicates that resource allocation is largely equitable, ensuring that students requiring additional support receive it, and underscores the importance of fairness in enhancing learning outcomes and transition rates. Finally, the study tested the null hypothesis ($H_{0.1}$) at a 0.05 level of significance, with results presented below:

Table 6

Model Summary for Teachers Responses on the Influence of Resource Allocation on Transition Rates

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130a	.017	-.003	.39864

The results in Table 7 indicate that resource allocation has a very weak positive relationship with transition rates among students in public day secondary schools in Bugesera District, with an R value of 0.130. This suggests that improvements in resource allocation are only minimally associated with increases in transition rates. The R^2 value of 0.017 indicates that approximately 1.7% of the variation in transition rates can be explained by resource allocation, while the negative adjusted R^2 of -0.003 reflects that the model has negligible explanatory power when accounting for sample size. The standard error of 0.39864 shows that the observed transition rates have a modest dispersion from the predicted values.

Table 7

ANOVA table for Teachers Responses on the Influence of Resource Allocation on Transition Rates

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.137	1	.137	.865	.357b
	Residual	7.946	50	.159		
	Total	8.083	51			

The results of the ANOVA analysis for teachers' responses on the influence of resource allocation on transition rates indicate that the relationship between resource allocation and student transition in public day secondary schools in Bugesera District, Rwanda is not statistically significant ($F(1, 50) = 0.865$, $p = 0.357$). Therefore, the hypothesis that resource allocation significantly influences transition rates cannot be supported.

Table 8

Regression Coefficients for Teachers Responses on the Influence of Resource Allocation on Transition Rates

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	3.536	.889		3.975	.000
Resource Allocation	.191	.205	.130	.930	.357

Dependent Variable: Transition Rates

The regression results indicate that the constant term is 3.536 and statistically significant ($t = 3.975$, $p = 0.000$), suggesting that the baseline transition rate in public day secondary schools is relatively high even before considering the effect of resource allocation. The coefficient for resource allocation is positive but not statistically significant ($B = 0.191$, $\beta = 0.130$, $t = 0.930$, $p = 0.357$), indicating that while increases in the provision of teaching materials, qualified

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teachers, and other educational resources may be associated with higher student progression, the effect is not strong enough to be conclusive in this context. Therefore, the hypothesis that resource allocation significantly influences transition rates was not supported.

4.3 Findings on the Influence of Technology Integration on Transition Rates

To assess the influence of technology integration on Transition rates, participants were asked to provide responses by filling in a questionnaire. This was achieved through using a five-point Likert scale, ranging from strongly agree to strongly disagree, to quantify the perceptions of respondents.

Table 9

Teachers Responses on the Influence of Technology Integration on Transition Rates

Statements	SD (N, %)	D (N, %)	N (N, %)	A (N, %)	SA (N, %)	Mean	Std
The use of digital learning tools has improved student understanding.	0 (0.0)	0 (0.0)	0 (0.0)	27 (51.9)	25 (48.1)	4.4808	0.50450
Students access e-learning platforms for academic support.	0 (0.0)	0 (0.0)	0 (0.0)	28 (53.8)	24 (46.2)	4.4615	0.50338
Teachers use technology to identify and track learners' progress.	2 (3.8)	0 (0.0)	0 (0.0)	28 (53.8)	22 (42.3)	4.3462	0.68269
ICT training is provided to both teachers and students.	0 (0.0)	0 (0.0)	0 (0.0)	31 (59.6)	21 (40.4)	4.4038	0.49545
Technology is effectively used in instructional support for low-achieving learners.	2 (3.8)	0 (0.0)	0 (0.0)	30 (57.7)	20 (38.5)	4.3077	0.67267
Integration of ICT has improved learner engagement and participation.	0 (0.0)	0 (0.0)	0 (0.0)	33 (63.5)	19 (36.5)	4.3654	0.48624

The results from the above table indicate that teachers generally perceive digital learning tools as effective in enhancing student understanding. Specifically, 51.9% of teachers agreed and 48.1% strongly agreed that the use of digital tools improved student comprehension, with a mean of 4.48 and a standard deviation of 0.50. This suggests near-universal agreement among teachers that technology supports students' grasp of learning content, particularly for those at risk of repeating grades.

Similarly, 53.8% of teachers agreed and 46.2% strongly agreed that students accessed e-learning platforms for academic support (mean = 4.46, SD = 0.50). This reflects that students are actively engaging with online resources to supplement classroom instruction, highlighting the accessibility and flexibility that digital platforms provide. Teachers also reported using technology to monitor and track student progress, with 53.8% agreeing, 42.3% strongly agreeing, and 3.8% strongly disagreeing (mean = 4.35, SD = 0.68). While most teachers employ ICT for performance tracking, minor variations exist due to differences in digital skills or infrastructure.

Regarding capacity building, 59.6% of teachers agreed and 40.4% strongly agreed that ICT training was provided (mean = 4.40, SD = 0.50), suggesting that teacher and student capacity development is well established, supporting the effective integration of digital tools in remedial programs. Further, 57.7% of teachers agreed and 38.5% strongly agreed that technology was effectively used to support low-achieving learners, with only 3.8% strongly disagreeing (mean = 4.31, SD = 0.67). This indicates that ICT plays a significant role in assisting struggling students, though some teachers still face challenges in implementation.

Integration of ICT was also reported to enhance learner engagement and participation, with 63.5% agreeing and 36.5% strongly agreeing (mean = 4.37, SD = 0.49). These results suggest strong consensus that digital tools increase motivation and active participation, particularly among students in remedial programs. Finally, the study tested the null hypothesis ($H_{0.2}$) at a 0.05 level of significance, with results presented below:

Table 10

Model Summary on the Influence of Technology Integration on Transition Rates

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.353a	.124	.107	.37625

The results suggest a weak positive relationship between resource allocation and transition rates (R = 0.353), with only 12.4% of the variation in transition rates explained by resource allocation (R^2 = 0.124; Adjusted R^2 = 0.107).

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Table 11

ANOVA table for Teachers Responses on the Influence of Technology Integration on Transition Rates

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.005	1	1.005	7.098	.010b
	Residual	7.078	50	.142		
	Total	8.083	51			

The regression results show that technology integration significantly predicted transition rates in public day secondary schools (F (1, 50) = 7.098, p = 0.010), explaining a modest portion of the variation.

Table 12

Regression Coefficients for Teachers Responses on the Influence of Technology Integration on Transition Rates

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.656	.642		4.134	.000
Technology Integration	.388	.146	.353	2.664	.010

Dependent Variable: Transition Rates

The regression results show that the constant was statistically significant (B = 2.656, t = 4.134, p = 0.000), indicating the baseline transition rate in public day secondary schools when technology integration is not applied. Technology integration was found to have a positive and statistically significant effect on transition rates (B = 0.388, β = 0.353, t = 2.664, p = 0.010), suggesting that the use of digital tools, online learning platforms, and ICT resources in remedial programs is associated with higher student progression. Therefore, the null hypothesis was rejected, and the study concluded that technology integration has a statistically significant influence on transition rates. Furthermore, most HTs acknowledged that the introduction of ICT tools such as computers, projectors, and digital content platforms had transformed lesson delivery and enhanced student engagement, particularly for low achievers. DOSs supported this view, noting that technology-aided instruction allowed for individualized learning and better monitoring of student progress. However, both HTs and DOSs highlighted challenges such as limited access to devices, insufficient training, and unreliable internet connectivity. Remedial students in FGDs mentioned that the use of educational videos, tablets, and online quizzes made learning more enjoyable and helped them understand difficult subjects.

4.4 Findings on the Influence of Stakeholder's Involvement on Transition Rates

To assess the influence of stakeholder's involvement on transition rates, participants were asked to provide responses via a questionnaire. This was achieved through using a five-point Likert scale, ranging from strongly agree to strongly disagree, to quantify the perceptions of respondents.

Table 13

Teachers Responses on the Influence of Stakeholder's Involvement on Transition Rates

Statements	SD (N, %)	D (N, %)	N (N, %)	A (N, %)	SA (N, %)	Mean	Std
Parents are regularly involved in addressing their children's learning challenges.	1 (1.9)	0 (0.0)	0 (0.0)	26 (50.0)	25 (48.1)	4.4423	0.60758
Teachers collaborate with parents to improve student academic outcomes.	0 (0.0)	0 (0.0)	0 (0.0)	28 (53.8)	24 (46.2)	4.4615	0.50338
The school management engages the community in learning initiatives.	0 (0.0)	0 (0.0)	0 (0.0)	26 (50.0)	26 (50.0)	4.5000	0.50488
Stakeholders are informed about student progress and academic support efforts.	0 (0.0)	0 (0.0)	0 (0.0)	34 (65.4)	18 (34.6)	4.3462	0.48038
School authorities involve stakeholders in decision-making for academic improvement.	0 (0.0)	0 (0.0)	0 (0.0)	29 (55.8)	23 (44.2)	4.4423	0.50151

The results indicated that 50% of teachers agreed and 48.1% strongly agreed that parents were regularly involved in addressing their children's learning challenges, with only 1.9% strongly disagreeing, yielding a mean of 4.44 and SD of 0.61. This suggests that the majority of teachers perceived parents as actively participating in their children's academic development. High parental involvement implies that parents monitor academic performance, provide learning resources, and collaborate with teachers to address learning difficulties. The small variation in responses shows that this perception was widely shared across schools. Such consistent engagement likely motivates students to engage seriously with learning and reduces the likelihood of grade repetition. Further results showed that 53.8% of teachers agreed and 46.2% strongly agreed that teachers collaborated with parents to improve academic

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outcomes, with a mean of 4.46 and SD of 0.50. This indicates that teacher-parent collaboration was strong and consistent across schools. Regular communication and joint interventions allow students to receive both academic and emotional support, enhancing confidence and performance. This high level of cooperation reflects an integrated approach to education, which is crucial for successful grade transition.

Additionally, 50% agreed and 50% strongly agreed that school management engaged the community in learning initiatives, with a mean of 4.50 and SD of 0.50. This demonstrates consensus that community involvement is essential in supporting education. Schools actively engage local leaders and community members in mentorship, counseling, and provision of educational resources, which fosters a supportive learning environment. Regarding stakeholder awareness, 65.4% agreed and 34.6% strongly agreed that stakeholders were informed about student progress, yielding a mean of 4.35 and SD of 0.48. This indicates that schools maintain effective communication channels with parents, community members, and other education partners. Providing regular updates on student performance allows stakeholders to identify learning challenges early and intervene, promoting timely remedial support. In addition, 55.8% agreed and 44.2% strongly agreed that school authorities involved stakeholders in decision-making, with a mean of 4.44 and SD of 0.50. This shows that participatory decision-making was widely practiced, reflecting inclusive school governance. Involving stakeholders in planning and evaluating remedial programs ensures diverse perspectives are considered, enhancing the quality and sustainability of interventions. In addition, the study tested the null hypothesis H0.2 at 0.05 level of significance and results are shown below:

Table 14

Model Summary for Teachers Responses on the Influence of Stakeholder's Involvement on Transition Rates

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.430a	.185	.169	.36291

The results in Table 15 show a moderate positive relationship between stakeholder involvement and student transition rates, with R = 0.430 and R^2 = 0.185, indicating that 18.5% of the variance in transition rates is explained by stakeholder involvement. The adjusted R^2 of 0.169 and standard error of 0.36291 suggest a modest but meaningful effect.

Table 15

ANOVA Table for Teachers Responses on the Influence of Stakeholder's Involvement on Transition Rates

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.498	1	1.498	11.373	.001b
	Residual	6.585	50	.132		
	Total	8.083	51			

The ANOVA results (F (1, 50) = 11.373, p = 0.001) suggest that stakeholder involvement has a statistically significant effect on transition rates in public day secondary schools. Thus, the null hypothesis was rejected. This indicates that greater engagement from parents, teachers, and the community can enhance students' progression to the next grade.

Table 16

Regression Coefficients for Teachers Responses on the Influence of Stakeholder's Involvement on Transition Rates

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.381	.589		4.040	.000
Stakeholder's Involvement	.446	.132	.430	3.372	.001

Dependent Variable: Transition Rates

The regression results show that the constant has a value of 2.381 and is statistically significant (t = 4.040, p = 0.000), indicating the baseline transition rate in public day secondary schools even in the absence of stakeholder involvement. Stakeholder involvement, however, has a positive and statistically significant effect on transition rates (B = 0.446, β = 0.430, t = 3.372, p = 0.001), suggesting that increased engagement of parents, teachers, and community members is associated with higher student progression to the next grade.

In addition, HTs reported that parents and community members contributed to students' transition by participating in academic follow-up meetings, offering financial support, and encouraging attendance. They stressed that schools with strong parent–teacher partnerships experienced fewer dropouts and higher transition rates. DOSs added that collaboration with local leaders and parent–teacher associations (PTAs) helped identify at-risk students early and

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mobilize support for them. FGDs with remedial students revealed that parental encouragement and home-based study support played a vital role in sustaining motivation and academic focus.

4.5 Findings on the Influence of Supervision of Remedial Program on Transition Rates

To assess the influence of supervision of remedial program on transition rates, participants were asked to provide responses via a questionnaire. This was achieved through using a five-point. Likert scale, ranging from strongly agree to strongly disagree, to quantify the perceptions of respondents.

Table 17

Responses on the Influence of Supervision of Remedial Program on Transition Rate

Statements	SD (N, %)	D (N, %)	N (N, %)	A (N, %)	SA (N, %)	Mean	Std
Remedial programs are regularly supervised by school leaders.	1 (1.9)	0 (0.0)	0 (0.0)	29 (55.8)	22 (42.3)	4.3846	0.59914
The head teacher monitors the effectiveness of remedial instruction.	1 (1.9)	0 (0.0)	0 (0.0)	31 (59.6)	20 (38.5)	4.3462	0.59027
Teachers receive feedback on the delivery of remedial lessons.	2 (3.8)	0 (0.0)	0 (0.0)	29 (55.8)	21 (40.4)	4.3269	0.67798
Program supervision helps identify and address student academic weaknesses.	2 (3.8)	0 (0.0)	0 (0.0)	29 (55.8)	21 (40.4)	4.3269	0.67798
Follow-up is conducted to ensure proper implementation of support programs.	0 (0.0)	0 (0.0)	0 (0.0)	25 (48.1)	27 (51.9)	4.5192	0.50450
School leadership supports teachers in improving the delivery of remedial activities.	2 (3.8)	0 (0.0)	0 (0.0)	28 (53.8)	22 (42.3)	4.3462	0.68269

The results showed that 55.8% of teachers agreed and 42.3% strongly agreed that remedial programs were regularly supervised by school leaders, with only 1.9% strongly disagreeing, yielding a mean of 4.38 and SD of 0.60. This indicates that the majority of teachers perceived consistent monitoring of remedial activities in their schools, suggesting that remedial programs were implemented systematically and that student learning gaps were actively tracked.

Head teacher monitoring of remedial instruction was reported by 59.6% of teachers agreeing and 38.5% strongly agreeing, with 1.9% strongly disagreeing, mean 4.35, SD 0.59. This shows that teachers recognized the active role of school leadership in overseeing instructional practices, ensuring that remedial teaching was delivered effectively. Feedback provision to teachers was affirmed by 55.8% agreeing and 40.4% strongly agreeing, with 3.8% strongly disagreeing, mean 4.33, SD 0.68. This indicates that most teachers received constructive guidance on lesson delivery, helping them to adapt teaching methods to the needs of students at risk of repeating grades.

Program supervision helping to identify and address student weaknesses was similarly supported, with 55.8% agreeing and 40.4% strongly agreeing, 3.8% strongly disagreeing, mean 4.33, SD 0.68. This shows that supervisory mechanisms were effective in detecting learning gaps and tailoring interventions accordingly. Follow-up to ensure proper implementation of support programs had 48.1% agreeing and 51.9% strongly agreeing, mean 4.52, SD 0.50, showing a strong consensus and minimal variation. This suggests that schools had effective monitoring mechanisms to ensure remedial programs were implemented as intended, reducing the likelihood of students failing to progress. School leadership support in improving remedial delivery was indicated by 53.8% agreeing and 42.3% strongly agreeing, 3.8% strongly disagreeing, mean 4.35, SD 0.68. This reflects general satisfaction with leadership involvement and underscores the role of administrators in enhancing the quality of remedial instruction. In addition, the study tested the null hypothesis H0.2 at 0.05 level of significance and results are shown below:

Table 18

Model Summary for Teachers' Responses on the influence of Supervision of Remedial Program on Transition Rates

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.510a	.260	.245	.34584

The results in Table 19 show that supervision of remedial programs has a moderate positive effect on transition rates, with $R = 0.510$, $R^2 = 0.260$, and adjusted $R^2 = 0.245$. This indicates that approximately 26% of the variation in transition rates is explained by supervision.

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Table 19

ANOVA table for Teachers Responses on the Influence of Supervision of Supervision of Remedial Program on Transition Rates

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.103	1	2.103	17.582	.000b
	Residual	5.980	50	.120		
	Total	8.083	51			

The ANOVA results indicate that supervision of remedial programs has a statistically significant influence on transition rates in public day secondary schools ($F(1, 50) = 17.582$, $p = 0.000$), suggesting that the manner in which remedial programs are supervised plays a critical role in student progression. The regression model explains a notable portion of the variation in transition rates, highlighting the importance of structured and regular supervision in enhancing program implementation.

Table 20

Regression Coefficients for Teachers Responses on the Influence of Supervision of Remedial Program on Transition Rates

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.972	.572		3.448	.001
Supervision of Remedial Program	.546	.130	.510	4.193	.000

a. Dependent Variable: Transition Rates

The regression results show that the constant (intercept) has a value of 1.972, with a standard error of 0.572, $t = 3.448$, and is statistically significant ($p = 0.001$). This indicates that even in the absence of supervision of remedial programs, the baseline transition rate in public day secondary schools is notable. Supervision of remedial programs, however, has a significant positive effect on transition rates ($B = 0.546$, $\beta = 0.510$, $t = 4.193$, $p = 0.000$), suggesting that effective supervision, including monitoring, guidance, and feedback to teachers, substantially contributes to students' progression to the next grade. Therefore, the hypothesis was supported, and the study concluded that supervision of remedial programs has a statistically significant influence on transition rates. Furthermore, HTs emphasized that frequent classroom observations, monitoring of lesson plans, and timely feedback to teachers improved the quality and consistency of remedial instruction. They also noted that effective supervision encouraged teachers to adapt teaching methods to individual learning needs.

4.6 Discussion

4.6.1 The Influence of Resource Allocation on Transition Rates

The regression analysis conducted in this study revealed a weak positive relationship between resource allocation and student transition rates ($R = 0.130$, $R^2 = 0.017$), indicating that the provision of resources alone accounts for only a small portion of the variation in student progression. While adequate resources are essential for supporting remedial programs, other factors such as instructional quality, teacher guidance and effective program management appear to have a stronger impact, consistent with the findings of (Abudetse, 2025).

Qualitative data from head teachers, deputy head teachers and students participating in remedial programs further underscore the value of well-managed resource allocation. The timely provision of textbooks, laboratory equipment, enables teachers to address diverse learning needs more effectively, while student engagement is enhanced through access to learning materials, libraries and teacher support. These observations align with the findings of (Mathieu, 2025) highlighting that strategic resource management not only enhance academic achievement but also reduces grade repetition and facilitates smooth student progression.

4.6.2 The Influence of Technology Integration on Transition Rates

The regression analysis in this study revealed a positive and statistically significant relationship between technology integration and student transition rates ($R = 0.353$, $R^2 = 0.124$, $F(1, 50) = 7.098$, $p = 0.010$). Although the proportion of variance explained is modest, the findings confirm that the use of digital tools, online platforms and ICT resources can support remedial learning and enhance student progression, consistent with the study of (Mbugua, S. N., Kibosh, J., & Tanui. E, 2015) . The baseline transition rate ($B = 2.656$, $p = 0.000$) and the positive effect of technology integration ($B = 0.388$, $\beta = 0.353$, $p = 0.010$) indicate that digital interventions contribute meaningfully to student advancement, thereby supporting the study hypothesis.

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Qualitative insights further reinforce these results. Head teachers observed that ICT tools, including computers, projectors, and digital content platforms, enhance lesson delivery and provide additional support for low-achieving students. Deputy head teachers highlighted the role of technology in facilitating individualized learning and monitoring student progress. Students reported that educational videos, tablets, and online quizzes made learning more engaging and easier to comprehend. However, challenges such as limited access to devices, insufficient training, and unreliable internet connectivity were also noted, suggesting that the effectiveness of technology integration depends on adequate infrastructure and capacity-building initiatives.

4.6.3 The Influence of Stakeholder Involvement on Transition Rates

The regression analysis of this study revealed a moderate positive relationship between stakeholder involvement and student transition rates ($R = 0.430$, $R^2 = 0.185$), with stakeholder engagement showing a statistically significant effect ($B = 0.446$, $\beta = 0.430$, $t = 3.372$, $p = 0.001$). These findings indicate that active participation of parents, teachers, and community members is linked to higher student progression, highlighting the importance of collaborative efforts in strengthening the effectiveness of remedial programs.

Qualitative data further support these results. Head teachers observed that parental and community involvement in academic follow-ups and financial support helped reduce dropouts and improved transitions. Deputy head teachers reported that collaboration with PTAs and local leaders enabled early identification of at-risk students. Focus group discussions with remedial students revealed that parental encouragement and home-based study support maintained motivation and sustained academic focus. These findings align with the work of (González, 2013) emphasizing that meaningful stakeholder engagement fosters accountability, reduces absenteeism, and promotes student success.

4.6.4 Influence of Supervision of Remedial Programs on Transition Rates

The regression analysis of this study revealed a moderate positive effect of supervision on student transition rates ($R = 0.510$, $R^2 = 0.260$, adjusted $R^2 = 0.245$), indicating that approximately 26% of the variation in student progression can be explained by supervision. ANOVA results confirmed a statistically significant influence ($F(1, 50) = 17.582$, $p = 0.000$), highlighting that structured supervision including monitoring, feedback, and guidance substantially supports student advancement. The regression coefficient ($B = 0.546$, $\beta = 0.510$, $t = 4.193$, $p = 0.000$) further underscores the strong positive relationship between oversight of remedial programs and transition outcomes.

These findings are consistent with previous research of (Nzayisenga,2025) demonstrating that effective supervision enhances instructional quality, addresses learning gaps and promotes higher productivity.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusion

The findings on resource allocation revealed that schools generally provide essential teaching and learning materials, adequate classroom facilities, and targeted funding for academically underperforming students, creating a foundation for remedial support. However, the impact of resource allocation on transition rates was relatively limited, suggesting that the mere availability of resources does not automatically ensure student progression. Their effectiveness is maximized when combined with effective teaching strategies, personalized interventions, and proper utilization of materials, highlighting that resources are necessary but not sufficient on their own to drive academic continuity.

In contrast, technology integration demonstrated a substantial positive effect on student progression. The use of digital tools, e-learning platforms, and ICT training enhanced student engagement, offered additional academic support for struggling learners, and facilitated real-time monitoring of performance. These findings indicate that technology not only enriches the learning experience but also actively promotes smoother transitions between grades, underscoring its transformative role in supporting both instruction and remedial programs.

The study also highlighted the critical role of stakeholder involvement. Active partnerships among parents, teachers, and the community were shown to positively influence student progression. Parental engagement in addressing learning challenges, collaboration with teachers, and community participation in school initiatives fostered supportive learning environments. Stakeholder involvement was found to strengthen accountability, encourage early intervention, and reinforce shared responsibility, collectively exerting a meaningful influence on transition rates.

Finally, supervision of remedial programs emerged as the most decisive factor affecting student progression. Regular monitoring of lesson delivery, timely feedback, and leadership follow-up on remedial instruction ensured that academic weaknesses were quickly identified and addressed. These findings suggest that effective leadership and focused instructional oversight are essential for promoting smooth grade-to-grade progression in public day secondary schools.

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5.2 Recommendations

The Ministry of Education should reinforce policies that enhance the supervision and management of remedial programs in secondary schools. Such policies ought to support targeted capacity-building initiatives for teachers, including training on effective delivery of remedial lessons and the integration of educational technology. Teachers should be encouraged to engage in collaborative planning, share best practices, and use feedback constructively to improve instructional quality. Schools should also prioritize the early identification of learners at risk of repetition and provide targeted interventions that promote academic progression.

Moreover, school leadership should foster a supportive environment that motivates teachers and ensures that remedial programs are both sustainable and effective in improving transition rates. Further research is recommended to examine the relationship between school leadership practices and the long-term sustainability of remedial interventions, as well as to investigate the role of teacher professional development in enhancing the effectiveness of remedial programs and their impact on student academic progression.

REFERENCES

Abudetse, R. K. (2025). *The changing landscape of African education*. Cari Journals USA LLC.

Akpalu, R. O. (2025). Strategic management in education: A conceptual review of teachers' perceived utilization of teaching and learning materials in mathematics education in Ghana. *International Journal of Research and Innovation in Social Science, 9*(1), 4581–4588. https://doi.org/10.47772/IJRISS.2025.9010351

Allen, B. (2016). *After-school tutoring increases academic performance*. LAP LAMBERT Academic Publishing.

Amineh, R. J., & Asl, H. D. (2015). Review of constructivism and social constructivism. *Journal of Social Sciences, Literature and Languages, 1*(1), 9–16.

Ankomah, Y. K., Koomson, J. A., Bosu, R. S., & Oduro, G. K. T. (2005). *Implementing quality education in low income countries*. Institute for Educational Planning & Administration, University of Cape Coast. https://assets.publishing.service.gov.uk/media/57a08c8fed915d3cfd001474/ghanarev.pdf

Bessho, S. I. (2019). Evaluating remedial education in elementary schools: Administrative data from a municipality in Japan. *Japan and the World Economy, 50*, 36–46.

Bettinger, E. P., Boatman, A., & Long, B. T. (2013). Student supports: Developmental education and other academic programs. *The Future of Children, 23*(1), 93–115. https://doi.org/10.1353/foc.2013.0003

Camilleri, M. A. (2016). Education and social cohesion for economic growth. *International Journal of Leadership in Education, 19*(5), 617–631.

Cristia, J., Czerwonko, A., & Garofalo, P. (2014). Does technology in schools affect repetition, dropout and enrollment? Evidence from Peru. *Journal of Applied Economics, 17*(1), 89–111.

Cut, S. S. (2023). The effect of an e-learning-based remedial program on students' learning outcomes: The case of fraction. *International Journal of Trends in Mathematics Education Research, 6*(2), 118–124.

González, R. L. (2013). Engaging with parents: The relationship between school engagement efforts, social class, and learning. *School Effectiveness and School Improvement, 24*(3), 316–335.

Hightower, A. M., Delgado, R. C., Lloyd, S. C., Wittenstein, R., Sellers, K., & Swanson, C. B. (2011). *Improving student learning by supporting quality teaching*. Editorial Projects in Education. https://www.edweek.org/research-center/research-center-reports/improving-student-learning-by-supporting-quality-teaching-key-issues-effective-strategies

Kabitina, E. F. (2024). *Parental engagement to their children's academic achievements in public secondary schools: A case of Nzega District Council, Tanzania* (Master's thesis, University of Dodoma).

Kalyoma, M. O. (2016). *Effectiveness of remedial teaching as intervention program against low achievement in mathematics among secondary school students in Tanzania* (Master's thesis, University of Dodoma).

Kirimi, J. K. (2016). Learners transition rates from primary schools to secondary schools in Kenya. *International Journal of Humanities, Social Sciences and Education, 3*(7), 37–57.

Lassesen, B., Stenalt, M. H., Rossen, D. S., & Bager-Elsborg, A. (2019). Do learning technologies contribute to reduce student drop-out? – A systematic review. In Y. W. Chew, K. M. Chan, & A. Alphonso (Eds.), *Personalised learning. Diverse goals. One heart: Proceedings of the 36th International Conference of Innovation, Practice and Research in the Use of Educational Technologies in Tertiary Education (ASCILITE 2019)* (pp. 169–177). Australasian Society for Computers in Learning in Tertiary Education. https://doi.org/10.14742/apubs.2019.249

Lavy, V. (2005). Targeted remedial education for underperforming teenagers: Costs and benefits. *Journal of Labor Economics, 23*(4), 839–874.

Lema, P. R., & Mwila, P. M. (2022). Community involvement in school activities: Its effectiveness in promoting quality of learning in public secondary schools in Hai District, Kilimanjaro, Tanzania. *International Journal of Research and Innovation in Social Science, 6*(9), 613–620. https://doi.org/10.47772/IJRISS.2022.6928

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Mathieu, K. (2025). *The effect of a resource management intervention on academic performance and self-regulated learning* (Doctoral dissertation, Texas A&M University-Commerce).

Mbugua, S. N., Kiboss, J., & Tanui, E. (2015). Influence of integration of information communication technology in teaching on students' academic performance. *Journal of Education and Practice, 6*(24), 7–13.

McCowan, T. (2013). *Education as a human right: Principles for a universal entitlement to learning* (1st ed.). Bloomsbury Academic.

Mensah, M. N. (2022). An evaluation of monitoring and supervision in the junior high schools curriculum delivery in Ghana. *Open Journal of Educational Research, 2*(6), 326–334.

MINEDUC. (2022). *Education statistical yearbook 2021/22: School year ending July 2022*. Government of Rwanda.

Molotsi, A., & van Wyk, M. (2024). Exploring teachers' use of technological pedagogical knowledge in teaching subjects in rural areas. *Journal of Information Technology Education: Research, 23*, Article 30. https://doi.org/10.28945/5395

Musyoka, L. (2013). *Influence of provision of school physical infrastructure on students' performance in Kenya certificate of secondary education in Mwingi central district, Kenya* (Doctoral dissertation, University of Nairobi).

Mwinyi, H. J. (2024). *Associating dimensions of parental involvement in promoting students' retention in secondary schools: A case of Kwimba District, Tanzania* (Master's thesis, University of Dodoma).

Ndwandwe, N. D. (2023). Parental involvement and academic achievement: Voices of role-players in secondary schools in Mpumalanga, South Africa. *Research in Social Sciences and Technology, 8*(4), 237–256.

Nshimiyimana, A. R. (2023). An evaluation of teaching and learning strategies used in remedial teaching and learning of biology in Rwanda's lower secondary schools. *African Journal of Educational Studies in Mathematics and Sciences, 19*(1), 149–158. https://www.ajol.info/index.php/ajesms/article/view/261645

Nzayisenga, E., & [Author Initial/Name]. (2025). Influence of instructional supervision on students' performance in Twelve Years Basic Education (12YBE) in Rwandan rural schools. *African Journal of Empirical Research, 6*(4), 230–241.

Okumbe, J. A. (1998). *Educational management: Theory and practice*. African Books Collective Ltd.

Olaifa, A. S. (2024). Parent-teacher association intervention strategies and goal achievement in public secondary schools. *International Journal of Educational Review, 6*(1), 25–35.

Ouma, I. A. (2024). Sustaining the future: Resource management in 100% transition policy implementation in public secondary schools in Siaya County, Kenya. *Baraton Interdisciplinary Research Journal, 10*, 49–67.

Papadogiannis, I. W. (2023). An assessment of the effectiveness of the remedial teaching education policy. *Knowledge, 3*(3), 349–363.

Pulukuri, S., & Abrams, B. (2020). Incorporating an online interactive video platform to optimize active learning and improve student accountability through educational videos. *Journal of Chemical Education, 97*(12), 4505–4514. https://doi.org/10.1021/acs.jchemed.0c00855

REB. (2020). *General guide to remedial and catch up program for learners at risk of repetition and dropping out.*

Smith, J. S., Akos, P., Lim, S., & Wiley, S. (2008). Student and stakeholder perceptions of the transition to high school. *The High School Journal, 91*(3), 32–42. https://doi.org/10.1353/hsj.2008.0003

Tarekegne, W. M. (2015). Challenges students face in their transition from primary to secondary school and the interventions schools take to ease the transition. *Educational Research and Reviews, 10*(5), 622–633.

UNICEF. (2023). The impact of remedial education in Rwanda. UNICEF. https://www.unicef.org/rwanda/stories/impact-remedial-education-rwanda

Upadhyay, A., Shoobridge, J., & Moss Coflan, C. (2020). Effective use of EdTech for remedial learning programmes: Considerations for Mongolia (Helpdesk Response No. 27). EdTech Hub. https://doi.org/10.5281/zenodo.5651111

Urio, P. J. (2018). Supervision of instructional programmes for improving students' performance in secondary schools in Tanzania. *Papers in Education and Development, 36*, 90–103. https://journals.udsm.ac.tz/index.php/ped/article/view/2526

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The use of social media among football clubs' public relations managers for motivating fans to attend the Kariakoo Derby in Tanzania, NBC Premier League

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ABSTRACT

Kariakoo Derby is the major football match between the historic Young Africans and Simba Sports Clubs in the Tanzanian NBC Premier League. Despite the growing social media platforms in football, little is known about how public relations managers use their clubs' social media platforms to motivate football fans to attend Kariakoo derbies, hence the need for this study. The study adopted the uses and gratifications theory. It employed a qualitative approach and descriptive design. Data were collected through focus group discussions, interviews, and observation methods. The study involved 30 Young Africans and Simba Sports Club fans sampled through a convenience technique; two clubs' public relations managers from both teams; one official from the Tanzania Football Federation, sampled purposively; and official social media platforms (Facebook, X, formerly known as Twitter, Instagram, TikTok, YouTube, and WhatsApp). Data were analysed using thematic analysis techniques. The results indicate that Young Africans and Simba Sports Clubs' public relations managers make effective use of social media platforms, which significantly motivates their fans to attend Kariakoo derbies in the Tanzania NBC Premier League. The strategies they employ are creating derby excitement, strengthening emotional bonds, providing clear derby information, actively engaging their fans, and promoting derby events. However, misuse of social media can result in conflicts, fighting, divorce, physical harm, or even death among football fans. The study concludes that responsible social media among public relations managers is an effective tool for motivating football fans to attend derbies; therefore, football clubs' public relations managers should adhere to the public relations code of ethics and principles to ensure that when motivating their fans to attend derbies, they promote peace, harmony, and loyalty for the social and economic development of fans, clubs, and the nation at large. It recommends that clubs adopt interactive, culturally relevant, and community-oriented strategies to sustain enthusiasm and maximise responsive fans' attendance during the derby.

Keywords: Football Fans' Attendance, Kariakoo Derby, Public Relations Managers, Social Media Platforms

I. INTRODUCTION

Globally, football is the most popular sport with growing fans, played by two teams of 11 players each and prominent in more than 200 countries, with around 250 million players worldwide (Khuddus et al., 2022). The Fédération Internationale de Football Association (FIFA), as the international governing body of association football, estimates that football has over five billion fans across age, race, gender, education level, and economic status worldwide (Bang & O'Connor, 2022). These football fans gain social and economic benefits through their engagement with their teams and the sport overall (Darabi & Shahri, 2020). Fans need motivation to actively support their teams both morally and financially (McCarthy et al., 2022). A study in the United States indicated that 70% of youth are football fans who follow social media updates from their teams' accounts (Romero-Jara et al., 2023; Aichner, 2019; Vale & Fernandes, 2018). In the UK, over 35% of soccer fans use Twitter to get their team's information (McCarthy et al., 2022). Meanwhile, in Germany, the 2024 Global Olympics Survey showed that 29% of football fans use social media for real-time results or live updates during matches (Gächter et al., 2024).

In the African context, football clubs use social media to motivate their fans' support. A typical example is Nigeria, where a 2024 survey found that 59% of Nigerians follow the English Premier League, while only 34% engage with their local league, indicating that international clubs' social media efforts outweigh those of local clubs (Owonikoko & Rookwood, 2022). Similarly, in South Africa, YouTube, used by 25.10 million people, is effectively utilised by Mamelodi Sundowns and Kaizer Chiefs clubs to influence their fans' engagement (Şirin et al., 2025). In Kenya, 57.5% of internet users actively access social media platforms as of January 2024, although few engage with their football clubs' social media platforms for support (Wiegratz, 2024). In Tanzania, there is a growing use of social media among football club fans, with Facebook accounting for 38.46%, followed by YouTube at 24.21%, and Twitter at 12.99% (Manyama et al., 2023). Simba SC's official Instagram account grew by 0.87% in November 2024, reaching over 7.4 million followers, indicating a digital transformation in football (Chille & Mollel, 2024). Their counterpart, Dar es Salaam Young Africans SC, has around 5.5 million social media followers, suggesting a digital development (Chille & Mollel, 2024). These examples illustrate the digital evolution of the football industry worldwide, including Tanzania.

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1.1 Statement of the Problem

The advancement of science and technology across different sectors of the economy has transformed the media from print to digital, where social media has become the new means of informing, entertaining, and shaping society for economic growth and sustainable development (Sanga, 2025). In sports, social media has become an alternative and convenient source of information for football club fans who follow the official football club pages from Europe, America, Asia, the Arab world, to Africa (Gächter et al., 2024; Owonikoko & Rookewood, 2022; Manyama et al, 2023; Chile & Mollel, 2024). Despite the increasing social media platforms in football across the world, little is known about the extent of Kariakoo derby followers on their clubs' official social media platforms and how these clubs' public relations managers use their official social media platforms to motivate their football fans to attend Kariakoo derbies, hence the need for this study.

1.2 Research Objectives

i. Exploring the extent of fans following the Young Africans and Simba Sports Club social media platforms;
ii. Examining the use of social media in motivating football fans' attendance at the derby matches.

II. LITERATURE REVIEW

2.1 Theoretical Review

The study adopted the uses and gratifications theory proposed by Blumler and Katz (1974). The theory posits that mass media communications actively engage users rather than making them passive recipients of news and information. The suitability of the theory in this study is based on its five basic assumptions: first, media use is goal-oriented and should serve a purpose, in this case motivating football fans; second, audiences should play an active role in the media they choose to use, in this case social media platforms that Young Africans and Simba Sports clubs follow to meet their needs; third, audiences, in this case football fans, have motives to use such social media; and fifth, only audiences can control the effects of the media (Sichach, 2023). The theory implies that football fans have their own motives for following their clubs' social media platforms; hence, public relations managers should employ various strategies to align the fans' personal objectives on clubs' social media platforms with clubs' objectives, particularly in derby attendance.

2.2 Empirical Review

Globally, social media use in football has been widely studied. For example, in Europe, research on English Premier League and Championship clubs in the United Kingdom involved interviews with 15 senior club executives across six clubs to understand how social media communications are used. The results indicate that football clubs use social media to enhance transparency and trust with fans (McCarthy et al., 2022). In England, Ireland, and Wales, football fans have developed different motivations for attending matches in stadiums. The study did not specify how to cultivate such motivation (Ozgider, 2016). In America, research found that fan motivation in a Midwestern city of the United States increased attendance at football matches. However, it did not specify how to foster this motivation (Mak et al., 2018). In Asia, a study of South Korean professional football assessed how clubs use social media to boost fan engagement. The results show that social media content significantly increases fan engagement compared to physical meetings (Kim & Choi, 2022). In Indonesia, marketing strategies motivated over 100 football fans to attend every match in their Premier League (Khuddus et al., 2022). Similarly, in the Iranian Premier League, fans' motivation has improved engagement with clubs and increased socioeconomic profitability. The study did not identify specific tools for fostering fans' motivation (Darabi & Shahri, 2020). Conversely, Rai et al. 2024) in India found that social media creates a sense of fantasy and competition among football fans, motivating them to participate in club activities. However, the study did not determine whether this motivation influences match attendance. A study of the social media strategies of African football clubs—focusing on prominent clubs such as Al Ahly (Egypt), Mamelodi Sundowns (South Africa), and Kano Pillars (Nigeria)—analyzed 1,800 social media posts and 25,000 fan comments from Twitter and Instagram (Jan–June 2024). The findings indicate that community-oriented and culturally relevant posts generate the highest fan engagement: for example, community posts (15% of content) received 6,000 likes with 70% positive sentiment, while cultural posts (10% of content) garnered 65% positive sentiment. In contrast, purely promotional posts had the lowest engagement (3,500 likes) and mostly neutral responses. Match-related content, which was the most common at 40%, experienced more negative sentiment when teams performed poorly. The study concludes that authentic, community- and culture-focused social media content best motivates African fans. It recommends that African clubs prioritize such content to build loyalty and manage performance downturns (Li, 2025).

A study in South Africa found that motivation drives football fans to attend matches to relieve job stress, escape a busy lifestyle, spend time with friends, or for entertainment. The study did not indicate how these fans receive such motivation (Wiid & Cant, 2015). Similarly, a study in Ethiopia indicates that socialization, performance, excitement,

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and esteem motivate fans to attend football matches, but it did not specify the means through which these fans are motivated (Admit et al., 2024).

Similarly, Amani (2023) investigated fans' motivation in Tanzania by focusing on English Premier League teams' Tanzanian supporters. Using partial least squares-SEM, he surveyed 322 Tanzanian sports fans and applied social identity theory to model eFANgelism (advanced fan advocacy). The analysis showed that fans' identification and engagement strongly drive eFANgelism through the mediator of perceived brand sacredness. In other words, Tanzanian fans who feel strongly connected to their team tend to promote the team passionately (e.g., evangelizing on social media) because they hold the team brand in high regard. Despite the increasing number of football fans on clubs' social media platforms (McCarthy et al., 2022; Gächter et al., 2024), little is known about how clubs' public relations managers use social media to motivate football fans' attendance at matches, particularly in the Tanzanian derby (Owonikoko & Rookwood, 2022; Wiegratz, 2024), hence a knowledge gap to be addressed in this study.

III. METHODOLOGY

3.1 Description of Study Area

The study was conducted in six social media platforms: Facebook, X formerly known as Twitter, Instagram, YouTube, TikTok, and WhatsApp, to gain insight into the online followers, providing rich knowledge into how social media use among public relations managers' campaigns to motivate football fans' attendance to the Kariakoo Derby in Tanzania. Scientifically, social media represents an ideal case study site due to its widespread use among football fans in the national, regional, and global population.

3.2 Study Time

The study was conducted between October 2024 and June 2025, in the 2024/25 NBC Tanzania Premier League season, during which two Kariakoo derbies were scheduled as home and away games. The first Kariakoo derby between Simba and Young African Sports Clubs in the season was played on 19th October, 2024, second round rescheduled after the match cancellation twice on 8th March and 15th June 2025, and then played on 25th June, 2025. This period was chosen because the teams' public relations managers and fans became more active on social media compared to the rest of the period.

3.3 Population and Sample

The study sample comprises 33 Kariakoo derby stakeholders, including 30 football fans, 15 from Young Africans and Simba each, who were conveniently sampled from 5 fans of social groups in each team from Dar es Salaam. Others include 2 public relations managers from Young Africans and Simba Sports clubs, and one official from the Tanzania Football Federation. The 33 sample for this qualitative study was adequate, as established by Warsame and Thoronjo (2024), that a sample between 30 and 500 is adequate for a qualitative study.

3.4 Data Collection methods and instruments

The study employed a focus group discussion with Young Africans and Simba Sports Club fans, supported with key informants' interviews with leaders of the fans' community wings. Similarly, an observation was conducted in both teams' official social media platforms, specifically, Instagram, X (Twitter), TikTok, Facebook, WhatsApp, and YouTube.

3.7 Data Analysis and Presentation

The study employed thematic analysis techniques to analyse data from interviews, FGD, and observation. The FGD notes were read thoroughly, and from them, initial codes were created by labelling data elements that appeared to be important to the study. After that, themes were identified and presented in thematic paraphrase to address the study objectives. The audio-recorded interviews were listened to, and verbatim quotes were identified to validate the FGD results in relation to the use of social media on fans' motivation to attend football derbies. For the case of observation, the figures indicating the number of followers in their respective club social media platforms were put in a table and computed to get a total number for each type of social media platform.

3.8 Trustworthiness

To ensure trustworthiness, four quality assurance criteria of qualitative research proposed by Haq et al. (2023) were considered: Enhancing credibility by triangulating focused group discussion results with interviews. For transferability, the transparency of the detailed description of the study context and participants, and research procedure was maintained. The study also considered the dependability of the results through a panel discussion of the focus group discussion and interview guide with research experts and public relations managers, which improved the tools to

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measure what was intended. Lastly, is conformability, the data presentation involved both thematic paraphrase of the focus group discussions and verbatim quotes of the respondents.

IV. FINDINGS & DISCUSSION

4.1 The number of followers on the Young Africans and Simba Sports Clubs' social media platforms.

The study explored the extent of fans following the Young Africans and Simba Sports Clubs' social media platforms. The results are presented in Table 1.

Table 1

The Number of Followers on Young Africans and Simba Sports Clubs' Social Media Platforms

Platforms	Young Africans	Simba Sport Club	Total followers
Instagram	4,800,000	8,000,000	12,800,000
X (Twitter)	405,081	1,989,915	2,394,996
Facebook	37,938	2,820,976	2,858,914
WhatsApp	771,858	2,200,000	2,971,858
TikTok	138,200	860,000	998,200
You tube	964,000	858,000	1,822,000

The results in Table 1 indicate that Young Africans and Simba Sports Clubs have a large number of football fans who follow their social media platforms to access the clubs' information. Exceptionally, Instagram was the leading platform, followed by WhatsApp, Facebook, Twitter, YouTube, and TikTok, which had the fewest followers. Attendance statistics from the Tanzanian Football Federation (TFF) indicate that, in the two Kariakoo derbies, spectator attendance was 51,352 (85.5%) and 51,897 (86.4%) for the first and second matches, respectively. These results deviate from experiences and previous reports on similar derbies in the African league and in England. For example, the Cairo derby in Egypt, played on 30th December 2020, between Zamalek and Ahly, tickets sold out before the match day, and spectators were banned from attending in 2012 due to violence (Mohamed, 2010). Similarly, the experience is contrary to the SOWETO derby in South Africa, between Kaizer Chiefs and Orlando Pirates, on 10th May, 2025, where ticket bookings exceeded the Moses Mabhida Stadium capacity (Madala, 2025), Likewise, in the Tunis derby between Club Africain and Esperance de Tunis, tickets are normally completely sold out within 48 hours after sales open (Olsson, 2025) similarly, in the Casablanca derby in Morocco between Wydad Casablanca and Raja Casablanca, in which tickets are sold out within 48 hours after sales open, or to the Algerian derby between USM Alger and MC Alger, in which thousands of fans remained outside the stadium due to a lack of tickets (Sannie, 2023). Furthermore, the results deviate from the Manchester derby in England between Manchester United and Manchester City, played on 13th April, 2025, where attendance was 99.23% (Bouchto, 2025; Inside world football, 2025). Despite the significant attendance percentage in the two derbies and the large number of fans and followers on these clubs' social media platforms, the stadiums were not full. This suggests that the clubs' social media platforms were not effectively utilized to motivate fans' attendance. Further analysis indicates that Benjamin William Mkapa Stadium, the National Stadium hosting the Kariakoo derbies in Tanzania, would not be sufficient because its seating capacity is limited to sixty thousand, compared to the number of followers on the clubs' social media platforms. The results indicate that most of the football fans who follow their clubs' social media platforms do not physically attend their matches, which suggests a need for additional strategies to use social media to motivate attendance at the Kariakoo derbies. Based on the uses and gratification theory, football fans follow clubs' social media platforms to meet their personal interests, which might differ from the clubs' goals and objectives. Therefore, not every fan following clubs' social media platforms is interested in the clubs' activities and attendance promotions. It is the role and responsibility of the public relations managers to develop social media strategies that capture fans' attention for derby attendance.

4.2 The Use of Social Media Platforms in Motivating Fans' Attendance at the Kariakoo Derby Matches

The study examined the use of social media platforms among Young Africans and Simba public relations managers on motivating fans' attendance to the Kariakoo derbies. The interview results with clubs' public relations managers confirmed the use. In their own voices, they said.

'We, as Simba Sports Club, normally use all the social media platforms, including Instagram, Facebook, WhatsApp channel, YouTube, Twitter, and TikTok to reach our fans towards matches, including the Kariakoo derbies' Ahmed Ally, public relations manager, Simba Sports Club, 2025). On the side of Young Africans Sports Club, he said. We use social media to share information about our club with our fans, which supplements press conference events. The platforms we use are Instagram, Facebook, WhatsApp channel, YouTube, Twitter, and TikTok, for more than 85% and they enable the club to engage our fans for the big match support, Kariakoo derbies in particular.' Ali Kamwe, public relations manager, Young Africans Sport Club, 2025). The results confirm the awareness, readiness, and actual use of

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social media among public relations managers of both teams, which is a significant achievement for the clubs and sports development in general.

For triangulating public relations managers' views on social media use in football fans' motivation to attend Kariakoo derbies, the focus group discussions were conducted on how their football fans become motivated by the public relations managers' use of social media platforms. The themes generated were: Creation of excitement among football fans, strengthening emotional bonds between fans and their football team, providing clear match information to their football fans, active engagement of football fans, and promotion of match events. Similarly, the fan social group leaders from both teams were interviewed to validate the themes gained from focus group discussions of football fans. The results are presented for each theme below:

4.2.1 Creation of Excitement among Football Fans

The focus group discussions with Young Africans Sports Club fans indicated that social media posts from public relations managers created excitement among football fans of both teams, which motivated them to attend the match. When such excitement is high, it influences their match attendance. The interview was conducted to triangulate the focus group discussions' results.

> "*We normally get excited about the match through social media posts from our team's public relations manager, Ahmed Ally, which motivate us to attend the match. The excitement rises as the match day nears. A Simba fan from the Mpira Pesa group"* (17 August 2025).

Their counterpart football rival, Young Africans Sports Club, fans said,

> *The match, especially the derby between Young Africans and Simba Sports Club, is very exciting. But the excitement is influenced by the way clubs' sports personnel utilize social media such as Instagram, Twitter, TikTok, and Facebook pages we follow to attract our attention to the match. (Young Africans fans from the Yanga Ilipo Tupo group,* August 2025).

The interview results confirm what was found in the focus group discussion about the influence of social media on the creation of derby excitement. The results mean, the extent to which public relations managers use social media to motivate their football fans to attend the derby match determines the match attendance. The results concur with a previous study in Nigeria where social media was used to create excitement among football fans (Owonikoko & Rookwood, 2022). If social media has football fans who follow their social media platforms, and if such social media is used effectively by public relations managers to create derby excitement among fans, the number of fans attending derbies would reach a full house capacity of 60,000 seats. The 85% match attendance indicates a significant achievement of the public relations manager in using social media to create derby excitement, but the remaining 15% requires integrated strategies.

4.2.2 Strengthening emotional bonds between fans and their football team

The focus group discussions with Young Africans Sports Club fans indicated that social media posts from public relations managers strengthen emotional bonds between fans and their football team, among football fans of both teams, which motivated them to attend the match. When such emotional bonds are very strong, it enhances their match attendance. The interview was conducted to triangulate the focus group discussions' results.

> "*I feel attached to the club through what is posted on social media about us, roles, and contributions to the team's success. Such feelings make us strive to attend the match because we cannot sit at home and wait for the fixture results (Simba fan from Wekundu wa terminal group*," August 2025).

On the other hand, their counterpart football rival, Young Africans Sports Club, fans said,

> *If you once heard 'I love you Yanga', from our prominent fan, the slogan is not mere words but real team feelings to strengthen unity towards the derby matches the social media circulated the slogan to inspire us to attend the team matches, including the derby*" (Young Africans fan from Wakali wa Salasala group, August 2025).

The interview results confirm what was found in the focus group discussion about the influence of social media on strengthening emotional bond towards the derby. The results mean, the extent to which public relations managers use social media to develop emotional bonds with fans of their club determines their derby attendance. The results concur with a previous study in South Africa, where social media are used effectively by Kaizer Chiefs and Orlando Pirates to strengthen emotional bonds with the team, which results in fans attending the Soweto derby in the full stadium capacity (Sirin et al., 2025). The use of social media among public relations managers to build emotional bonds between football fans and their club towards derby matches is effective; however, most of the fans who follow clubs' social media platforms do not attend the Kariakoo derby, contrary to the Soweto derby, hence a need for new tactics for improvement from 85% attendance to 100%

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4.3 Providing Clear Match Information to their Football Fans

The focus group discussions with Young Africans Sports Club fans indicated that social media posts from public relations managers feed their football fans with clear information and directives towards the match, which motivated them to attend the match. When such information is clear and understood, it enhances their match attendance. The interview was conducted to triangulate the focus group discussions' results.

> "*Social media has taken over the role of newspapers, radios, and televisions, where you have to wait for hours or a whole day to get the club's information. With social media, you get clubs' current news instantly about the line-up, injuries, and bonuses towards the Derby* "(A Simba fan from Kamati ya Roho Mbaya group, August 2025).

On the side of their counterpart football rival, Young Africans Sports Club, fans said,

> *The derby is a big match of the season for our team, entails a lot of information circulating, which may impact fans' attendance at the derby. The presence of social media has made it easier for the match information to reach its expected fans. For example, match day, time, and entrance fee*" (Young African fan from Pamoja Tandale group, August 2025).

The interview results confirm what was found in the focus group discussion about public relations managers' use of social media to provide clear information about the derby. The result is similar to previous studies in Indonesia (Khuddus et al., 2022) and the United States of America (Mak et al., 2022), where social media is used to share information about football matches, including derbies. The results indicate that Young Africans and Simba Sports Club public relations managers use social media platforms to share match information, and the attendance of 85% is promising. More effort is required to reach 100% stadium capacity because these clubs have a good number of followers. Based on the uses and gratification theory, football followers in clubs' social media have their own goals and interests; to capture their attention to derby attendance requires an extra effort.

4.4 Active Engagement of Football Fans

The focus group discussions with Young Africans Sports Club fans indicated that social media posts from public relations managers enhance active engagement of football fans of both teams, which motivated them to attend the match. When such engagement is high, it enhances their match attendance. The interview was conducted to triangulate the focus group discussions' results.

> *The success of a football club relies mainly on the active engagement of its fans to support their club in purchasing official jerseys and other club products and services. In this area, social media has become an effective link for the fans and the club altogether* (Simba fan from Simba Damu group, August 2025).

Their counterpart football rival, Young African Sports Club, fans said,

> *"Social media is too engaging for the derby issues; most of the fans become more active when the derby nears to get updated information about the club's preparation and expectations. This period determines whether one should attend or not*" (Young African fans from the Yanga the Great group, August 2025).

The interview results confirm what was found in the focus group discussion about the use of social media platforms among public relations managers on the active engagement of football fans in the derby matches. The results concur with a previous study in Egypt, where social media is the main tool used by public relations managers for actively engaging their fans in the Cairo derby between Zamalek and Ahly, in which tickets were completely sold out even before the match day, before fans' attendance was banned due to violence cases (Mohamed, 2010). The result means, football fans in Egypt were actively engaged in their club through the effective use of social media by public relations managers they breaking away the barriers of gratification theory that media users have their own interests, to move them to the clubs' interests of fan attendance in derbies. If that is the case, public relations managers of the Kariakoo derby teams should learn new strategies to ensure that the match attendance is at full capacity 100%, beyond the current state of 85%.

4.5 Promotion of pre, in-match, and post-match events

The focus group discussions with Young Africans Sports Club fans indicated that social media posts from public relations managers promote pre-match and post-match events, which motivated them to attend the match. When such promotion is low, it negatively affects their match attendance. The interview was conducted to triangulate the focus group discussions' results.

> *Derbies are normally featured by a variety of promotions. Apart from motivating fans' attendance, it's also a time for clubs' merchandising and providing community services like visiting orphanage centres and blood donation. Without effective use of social media, the goals and objectives will hardly be achieved as expected"* (Simba fan from Mpira na Maendeleo group, August 2025).

On the other hand, their counterpart football rival, Young Africans Sports Club, fans said

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> *Always, the pre-match social media posts promote the team in terms of quality and past victories. The in-match posts are normally based on match updates, but after the match, the posts change in tone based on the winning side. For us, we take soup to scorn our rivalry with Simba fans*" (Young African fans from Nguvu ya Buku group, August 2025).

The interview results confirm that public relations managers use their clubs' social media platforms for derby promotion of pre, in-match, and post-match events. The result concurs with previous studies in England and the United States of America, where match events promotion influences football fans' attendance, particularly in derbies (McCarthy et al.,2022; Mak et al., 2018). Based on the uses and gratification theory, public relations managers should effectively and responsibly use their clubs' social media platforms to control post-match events, which might result in violence, injury, death, or destruction of properties, as it once happened in the SOWETO and Cairo derbies.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that Young Africans and Simba Sports Club have millions of followers on their official social media platforms, which makes the platforms a potential ground for information sharing and fans' engagement. Similarly, the public relations managers of these clubs have successfully made use of social media platforms to motivate their football fans' attendance at the Kariakoo derbies. The success can be viewed in the key five thematic aspects: Creation of excitement among football fans, strengthening emotional bonds between fans and their football team, providing clear match information to their football fans, active engagement of football fans, and promotion of match events. However, the attendance statistics for the recent derbies played in the 2024/2025 season indicate an 85% for the national stadium with a capacity of 60,000, while these clubs' social media platforms have millions of followers, hence a need for improvement.

5.2 Recommendations

The results indicate an attendance gap of 15% in the Kariakoo derbies, which draws a recommendation for additional techniques to reach a full house (100%) attendance as a means of financial and psychological engagement of football fans with their clubs. Similarly, based on the gratification theory, media users (football fans in this case) have their own control of the media effect; therefore, public relations managers should ensure a responsible use of social media platforms to control post-derby events, which might threaten peace, harmony, and security of the teams, fans, and the general public. Moreover, Simba and Young Africans Football Clubs in Tanzania should invest in more interactive, culturally relevant, and entertaining social media campaigns, focusing mainly on timely content refreshment, creative content, and two-way communication with fans to keep them glued to the Kariakoo derby and sustainable football development.

Conflict of Interests

The author has not declared any conflict of interest.

REFERENCES

Admit, D. G., Tegegne, Z. M., & Alemu, S. M. (2014). Why do fans attend football games? Motivational factors in the Ethiopian Premier League, 2023-24. *Federación Española de Asociaciones de Docentes de Educación Física (FEADEF), 60*, 83–89.

Aichner, T. (2019). Football clubs' social media use and user engagement. *Marketing Intelligence & Planning, 37*(3), 242–257. https://doi.org/10.1108/MIP-05-2018-0155

Amani, D. (2023). Hail to thee, my sports team brand: Investigating the drivers of eFANgelism among fans of selected sports teams in the English Premier League (EPL). *Future Business Journal, 9*, Article 83.

Bang, P., & O'Connor, P. (2022). The psychology and motivations of sports fans. *Journal of Student Research. High School Edition, 11*(3), 1–13.

Blumler, J. G., & Katz, E. (Eds.). (1974). *The uses of mass communications: Current perspectives on gratifications research*. Sage.

Bouchto, M. (2025). *Casablanca Derby: Passion beyond the pitch.* World of Football. https://thefootballweek.com/2025/11/08/casablanca-derby-wydad-raja/

Chille, F. J., & Mollel, A. B. (2024). Factors influencing the adoption of the diffusion of Instagram social media innovations among selected football clubs in Tanzania. *Indonesian Journal of Social Research (IJSR), 6*(1), 32–43.

Darabi, M., & Shahri, M. S. A. (2020). Football fans: Investigating the relationship between fan motivation and aggressive behaviours. *Research in Sport Management and Marketing, 1*(1), 28–36.

Licensed Under Creative Commons Attribution (CC BY-NC)

Gächter, A., Stegmann, P., & Lang, G. (2024). A uses and gratifications-based market segmentation approach to football fans' online media usage motivation. *Communication & Sport*, 21674795241273875.

Haq, Z. U., Rasheed, R., Rashid, A., & Akhter, S. (2023). Criteria for assessing and ensuring the trustworthiness in qualitative research. *International Journal of Business Reflections, 4*(2), 120–129.

Inside World Football. (2025, April 13). Match week 31 attendances: Manchester derby remains a hot ticket, but Spurs and Leicester fans send messages. https://www.insideworldfootball.com/2025/04/13/match-week-31-attendances-manchester-derby-remains-hot-ticket-spurs-leicester-fans-send-messages/

Khuddus, L. A., Wijaya, A., & Priyanto, Y. D. A. (2022). Fanaticism of football fans in the achievement of the football club case study: Persebaya Football Club. *International Journal of Social Science and Human Research, 5*(4), 1476–1484.

Kim, D.-K., & Choi, C. (2022). Social media marketing for professional soccer clubs: Focusing on the quality of the relationship between the club and fans. *Physical Culture and Sport. Studies and Research, 96*, 12–20.

Li, F. (2025). Digital fan engagement strategies in African football: A content and sentiment analysis. *Journal of Information Systems Engineering and Management, 10*(55s), Article 805.

Madala, M. (2025). No venue big enough for Soweto Derby as system crash leads to overbooking for Nedbank Cup Final. *Central News*. https://w.w.w.centralnews.co.za/psl-ceo-mato-madlala-no-venue-big-enough-for-soweto-derby-as-system-crash-leads-to-overbooking-for-nedbank-cup-final

Mak, J., King, C., & Heo, J. (2018). An examination of motivation and identification of football fans. *Journal of Applied Marketing Theory, 8*(1), 21–27.

Manyama, A., Kisawike, B., Simba, C. A., & Golyama, B. (2023). The influence of marketing communication strategies on fandom development in Tanzania: A case of selected Premier League football clubs.

McCarthy, J., Rowley, J., & Keegan, B. J. (2022). Social media marketing strategy in English football clubs. *Soccer & Society, 23*(4–5), 513–528.

Mohamed, M. (2010). Cairo Derby ticket revenue breaks LE1 million. https://english.ahram.org.eg/NewsContent/6/51/2922/Sports/Egyptian-Football/Cairo-Derby-ticket-revenue-breaks-LE-million.aspx

Olsson, A. (2025). Tunis Derby: Esperance lose two key players in Club Africain draw. *Pan-Africa Football*. https://africasoccer.com/algerian-derby-breaks-attendance-records-with-remarkable-fan-turnou

Owonikoko, S. B., & Rookwood, J. (2022). Consumer behaviour and the relational dynamics of English Premier League supporters in Nigeria. *Soccer & Society, 23*(4–5), 367–385.

Ozgider, C. (2016). Motivational factors affecting sport fans' participation in UEFA Euro 2016 Soccer Championship (Doctoral dissertation). Middle East Technical University.

Rai, J.S., Cho, H., Itani, M., & Singh, A. (2024). The impact of social media-related motivation on fantasy sport users' playing skills, sense of competition, and performance expectancy. *Asia Pacific Journal of Marketing and Logistics, 36*(1), 1–23. https://www.emerald.com/insight/1355-5855.htm

Romero-Jara, E., Solanellas, F., Muñoz, J., & López-Carril, S. (2023). Connecting with fans in the digital age: An exploratory and comparative analysis of social media management in top football clubs. *Humanities and Social Sciences Communications, 10*(1), 1–12.

Sanga, F. E. (2025). The impact of social media use on students' behaviour changes in Tanzanian tertiary institutions. *African Quarterly Social Science Review, 2*(3), 44–52. https://doi.org/10.51867/AQSSR.2.4.5

Sannie, F. (2023). Algerian derby breaks attendance records with remarkable fan turnout. https://africasoccer.com/algerian-derby-breaks-attendance-records-with-remarkable-fan-turnout/

Sichach, M. (2023). Uses and gratifications theory: Background, history, and limitations. SSRN. https://ssrn.com/abstract=4729248 or http://dx.doi.org/10.2139/ssrn.4729248

Şirin, T., Eryilmaz, F., Eratli Şirin, Y., Aydin, Ö., & Metin, M. (2025). Social media analysis in the context of the social responsibility approach of football fan groups. *Frontiers in Psychology, 16*, 1521688.

Vale, L., & Fernandes, T. (2018). Social media and sports: Driving fan engagement with football clubs on Facebook. *Journal of Strategic Marketing, 26*(1), 37–55.

Warsame, A. S. N., & Thoronjo, E. (2024). Relevance of monitoring and evaluation training practices on the performance of NGOs' employees in Uganda. *African Journal of Social Issues, 7*(1), 416–423. https://dx.doi.org/10.4314/ajosi.v7i1.26

Wiegratz, J. (2024). Changing the game: The dynamics of the commercialisation of football in Uganda and Kenya (Report). International Centre for Sports Studies.

Wiid, J. A., & Cant, M. C. (2015). Sports fan motivation: Are you going to the game? *International Journal of Academic Research in Business and Social Sciences, 5*(1), 383–398.

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