

Affordances of lesson observation in a lesson study cycle: A case of mathematics teachers in Chingola District, Zambia

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<https://doi.org/10.51867/ajernet.6.2.69>

ABSTRACT

Lesson Study approach has been adopted as the learning module in Zambia, however, not all teachers have implemented stable and effective School Based Continuous Professional Development in a Lesson Study. This study investigated the component of lesson observation in a Lesson Study Cycle and its role in enhancing the quality of teaching and learning among teachers of mathematics in Chingola District, Zambia. Two research question guided the study as; how do teachers of mathematics conduct lesson observations in a lesson study cycle? How does lesson observation enhance the quality of teaching and learning? Concurrent triangulation mixed method design was employed throughout the study. The target population was the teachers of Mathematics teaching senior classes and the senior secondary grade learners. The six Government schools in the study were selected using purposive sampling on the basis of the implementation of the lesson study cycle. While the teachers were selected using total population sampling in order to capture each member of the department. On the other hand, the learners selected was based on performance and fluency in English using purposive sampling. A sample of thirty (30) teachers and 12 learners were used for the study. Data were collected via a questionnaire, focus group discussions and interviews. Nvivo and Descriptive statistics were the statistical tools used for data analysis. The findings from the study revealed that lesson observation in the lesson study cycle had significant potential to enhance teaching and learning in mathematics. However, inconsistent implementation, inadequate adherence to guidelines, and limited teacher collaboration undermined its overall effectiveness. Based on this, it was recommended that, Heads of Department (HoDs), teachers and its stake holders should strengthen adherence to lesson study guidelines at all stages of implementation. Besides, Headteachers and Heads of Department should enhance teacher collaboration through regular, structured professional development sessions.

Keywords: Lesson Observation, Implementation, Learning, Mathematics, Teaching

I. INTRODUCTION

Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them of what to do. Fortunately, most human behavior is learned observationally through modeling. As suggested by Bandura (1977), observation is a critical part of developing any ability; and there is a growing body of research supporting the observation of both skilled teachers and peers as valuable practices for teacher development (Anderson et al, 2005, Madsen & Cassidy, 2005). To that effect, experiences that allow preservice and in-service teachers to observe teaching are considered a key component of teacher education and professional development, and there was even a growing movement to use observation in higher education, for the purpose of enhancing the quality of university teaching and learning (Hammersley-Fletcher & Orsmond, 2005).

Lesson observation practices have tremendous potential to advance our understanding of teaching and learning by capturing the instructional process through the lens of teaching behavior and students' responses, which can be used to improve instruction. As a result, it had been widely adopted as a component of teacher professional development programs and is viewed as a critical activity for successful implementation of lesson study (Lewis & Hurd, 2011; Myers & West, 2012). When observation accepted as a critical activity in lesson study, it important to consider how it should be conducted effectively and what should be observed to accomplish its objectives.

The study by Dudley (2014) suggested that each observer should concentrate on observing two or three students (a group of students) in detail. He also recommended that during the planning meeting, the chosen students for observation should be identified and their learning reaction noted. Meyer and Wilkerson (2011) added that observers

were not permitted to interfere with the research lesson by conversing with learners and were expected to record as many details as possible about their observation focus. Furthermore, Fernandez et al. (2003) explained that Japanese teachers observed the lesson to collect data by writing detailed and copious notes about how the lesson unfolded directly on their lesson plans. However, Lewis and Hurd (2011) outlined a five-step procedure for observing a research lesson: respect the classroom atmosphere (silence phone, avoid side conversations, and arrive on time, staying for the entire class); avoid assisting students or interfering with the natural flow of the lesson; collect data requested by the lesson planning team; focus on a single student or group of students) throughout the entire lesson to gain insight into how they developed understanding; and ask clarifying questions of a student after the lesson has concluded. This procedure ensures that the information collected through lesson observation is accurate and meaningful to teachers while minimizing disturbances in the teaching and learning atmosphere.

Teachers occupy a central position in any educational system, significantly, influencing the quality of educational outcomes. Ayeni (2010) asserts that, teachers' roles are crucial for an effective and efficient teaching and learning process. He contends that, teachers are expected to provide essential services such as lesson planning, effective delivery of lessons, and proper monitoring and evaluation of students. Evaluation a vital component of teaching and learning process helping both teachers and learners improve.

According to the Oxford English Dictionary (2020), 'evaluation' literally means determining value. Chigeru (2020) describes evaluation as a systematic process of collecting, analyzing, and interpreting information to determine the extent to which learners achieve instructional objectives. Onunkwo (2005) views evaluation as a process involving value judgments about person, thing, program or objects based on data gathered through tests, observations, and sociograms. Therefore teachers will be able to use the evaluation data as a basis for suggesting change.

Consequently, evaluation is the process of determining the worth or value of students, teachers, the teaching - learning process and programs based on data collected through measurement instruments such as paper-and-pencil tests, observations and checklists. All mathematics teachers should have the opportunity to engage in analytical reflection on their practice, learn to critically evaluate research and develop strong inquiry skills early in their careers. That will maximise their engagement in, and benefit from, sustained personalised learning and collaborative learning groups (Advisory Committee of Mathematics Education (ACME), 2015). Throughout their careers as mathematics teachers should have opportunities to develop critical evaluation skills, which involve evaluating research, engaging in analytical reflection, cultivating inquiry skills, conducting lesson studies and performing action research. These skills will enable teachers to reflect on and evaluate their own knowledge of mathematics and its teaching, as well as explore their practices and those of others. Through School-Based Continuing Professional Development (SB CPD), mathematics teachers have the opportunity to sustain their mathematics-specific professional learning with ongoing support from a collaborative learning, (Ministry of Education [MOE], 2010).

However, Wolthius et al (2020) note that worldwide lesson study practices typically do does not involve live observation. With the adoption of the Lesson Study approach as a learning module in Zambia, not all teachers have implemented stable and effective School Based CPD on Lesson Study (MOE, 2007). Moreover, a 2024 report by Ministry of Education (MOE) & United Nations Children's Fund (UNICEF) stated that the materials used for SBCPD on lesson study were not uniform and did not align with each other leading to a lack of consistency in the implementation of the SB CPD activities in schools. The findings further indicated that the missing steps in the lesson study cycle (steps 1, 5, and 8) compromised the quality of the lesson study process, (MOE & UNICEF, 2024). Additionally, the MOE (2007) identified a gap in the limited research on the implementation and effectiveness of lesson study as a professional development approach in Zambia. This gap highlighted the need for further research on the adoption, adaptation and impact of lesson study in the Zambian context. Therefore, this study explored the affordances of lesson observation within a lesson study cycle, focusing on mathematics teachers in the Chingola district of Zambia.

1.1 Research Questions

The study was guided by two research questions:

- i. How do teachers of mathematics conduct lesson observations in a lesson study cycle?
- ii. How does lesson observation enhance the quality of teaching and learning?

II. LITERATURE REVIEW

The classroom is an environment from which lots of information can be collected with relation to the nature of interactions between the students and the teacher as well as the degree of effectiveness of these activities for the achievement of the ultimate objective in learning. Classroom observation can be done in a variety of ways ranging from descriptive, subjective observation to more objective and systematic ones. Martinez et al (2011) interactive coding system is among the most systematic types of observation which is based on a principled analysis of the observable behavior of both the teacher and the learners in the class in a non-judgmental manner. If done systematically, classroom

observation serves as a strong resource for gathering insightful information about the learning process and also the nature of the interaction between the participants (teachers and learners) of such a process (Mackey & Gass, 2005)

When observation is accepted as a critical activity in the lesson study, it is important to consider how it should be conducted effectively and what should be observed in order to accomplish its objective. The study by Dudley (2014) suggests that each observer should make a concentrate effort to observe two or three students (a group of students) in detail. He also suggested that during the planning meeting, the chosen students for observation should be identified and a note made of their learning reaction. Meyer and Wilkerson (2011) added that observers were not permitted to interfere with the research lesson by conversing with learners and were expected to record as much as details as possible about their observation focus. Besides, Fernandez et al. (2003) added and explained that the Japanese teachers observed the lesson to collect the data by writing detailed and copious notes about how the lesson unfolded directly on their lesson plan.

In terms of lesson observation focus, there have been several studies in the literature stating on what to observe during a lesson. Lewis (2016) and Saito (2012) described that observation in lesson study is focused upon students rather than teachers and provide information to lesson study practitioners. In support of that, Wood and Pearce (2019) stated that the focus on observation should be on; students learning and their process of learning; the difficulties they encounter; the understandings they develop and misconceptions that emerge in the learning/teaching process. In line with that, Lomibao (2016), adds that observers can observe student reaction, facial expressions and interactions. In addition, Murata (2011) and Wolthius et al. (2020) proposed that teachers pay attention to student thinking and take notes on student and teacher dialogues as well as observation notes on manipulative use and student work. Dudley (2011) emphasises that Observers endeavor to capture the pupils' focus responses at different points in the lesson and how they match or differ from what was predicted at that stage of planning. One common feature been highlighted from the above literature is that the focus on the lesson observation practice should be on the learner and on ways to make learning better. The emphasis is on the learner because the lesson is owned by the group and as a group, they observe the research lesson. As a result, the critique or observation is not on the teacher but the lesson.

Evaluation in one form or the other is inevitable in teaching-learning process, as in all fields of activity of education judgment need to be made. Hence, it is desirable that teachers must acquire knowledge and understanding about the various aspects of evaluation and its application in the classroom, (Ehiemere, 2022). All those teaching mathematics should have the opportunity to reflect analytically on their practice, learn to critically evaluate research and develop strong inquiry skills from early in their career. This will maximise their engagement in, and benefit from, sustained personalised learning and collaborative learning groups, (ACME, 2015). Throughout their careers as teachers of mathematics, all teachers should have the opportunity to develop critical evaluation skills, which can involve evaluation of research, analytical reflection, enquiry skills, lesson study and action research. These skills should allow teachers to reflect on and evaluate their knowledge about mathematics and knowledge about the teaching of mathematics and enable them to explore their own practice and that of others.

Currently in England, the place of research and critical evaluation varies across ITE routes and not all trainee teachers have the opportunity to develop the critical evaluation skills needed to mature as effective teachers, (ACME, 2015). It is essential that teachers have the opportunity to develop and build on those skills during their career both individually and collaboratively. Among the other benefits of evaluation are that; it helps a teacher in deciding and developing ways, methods, and techniques of teaching; formulate and reformulate suitable and realistic objectives of instruction improve instruction and to plan appropriate and techniques of instructions; in the improvement of curriculum; assessing different educational practices and ascertains how far learning objectives can be achieved, (Ehiemere, 2022).

Evaluation of students' performance may be classified based on the functional roles in the classroom situation as; formative, Summative, placement and diagnostic evaluation, (Ehiemere, 2022). The formative evaluation determines the worth of the students' performance, it is used to monitor learning progress during instruction, provide continuous feedback to but the students and teachers on the issues concerning the success and failures in the teaching and learning process. While summative evaluation takes place at the end of instruction or programme. The summative evaluation used to determine the extent to which the instructional goals have been achieved and examples evaluation done at the end of the term or a programme, (Ehiemere, 2022) and is mainly used for certification. On the other hand, placement evaluation is used to evaluate students at the beginning of the instruction to determine students' entry behaviour. Ukwuije (2007) stated that placement evaluation elicits the extent to which students' interest, altitudes; habits will be suitable for their pursuance of a particular course of programme. Linn and Gronlund (2000) added that placement evaluation should focus on questions like; do the students' possess the knowledge and skills needed to begin the planned instruction? To what extent do student already developed the understanding or skills that are goals of the planned instruction; and to what extent do the students' interests, work habits and personality characteristics indicated that one mode of instruction might be better than another, Ukwuije (2007). To answer these questions will require the use of variety of techniques such as records of past achievement, pretests on course objectives, self-report inventories and observational techniques. While diagnostic evaluation is done to determine the learning difficulties during instruction. It is used to determine the causes of persistent learning difficulties and to formulate a plan for remedied action,

(Ehiemere, 2022), and to carry out this evaluation, data are mostly elicited from diagnostic test as well as various observational techniques.

However, in the lesson study evaluation practices involves among them collaboration evaluation were teachers work together to evaluate lesson's effectiveness, sharing observations and insights, it also focuses on students learning rather than teacher performance, (MoE, 2010). The teachers will be required to set specific goals and assess learner progress toward those goals. In this case the teachers use variety of methods such as observations, self-assessment and assessment to evaluate student learning. Besides that, teachers engage in a post discussion in a reflective way to analyse the lesson's weaknesses and strengths. By incorporating evaluation teachers can improve; student learning outcome; enhance teaching practices and develop collaborative professional learning community.

Lesson observation serves a range of functions in different educational settings around the world, for example, as a means of supporting teachers' initial education or ongoing professional learning (O'Sullivan, 2006; Cajkler et al., 2013; Wood & Pearce, 2019; monitoring for compliance and accountability purposes; evaluating the impact of policies or interventions on classroom practice (Matsumura et al., 2008). For instance, in sub-Saharan Africa, there are long traditions of using observation as a means of assessing the quality of education provision. Within civil service structures, district supervisors and others in positions of leadership have used observation protocols and checklists to assess classroom environments and monitor teachers' compliance with policy directives, for example, in terms of teaching methods, curriculum coverage, equipment, dress and other aspects of conduct (Anderson Levitt & Diallo, 2003; De Grauwe, 2001). Not only that, Lesson observation has a longstanding tradition in the assessment and development of new and experienced teachers as in case England, and over the last two decades it has progressively emerged as an important tool for measuring and improving professional practice in schools and colleges, (Myers & West, 2012)

One of the underpinning issues traversing the different contexts and purposes of observation in schools is the notion of teacher effectiveness. According to the World Bank Group's recent report, for example, recommended focusing on observational outcomes such as the teachers' use of instructional time and materials, the teachers' core pedagogical practices and the teachers' ability to keep learners engaged (Ayeni, 2010). The use of lesson observation is not an innovative approach, yet, the literature suggests that it is rarely used in research and evaluation studies which seek to improve and assess quality in developing countries, and even more rarely to inform policy or in implementation efforts. Lesson observation can answer the "what" questions and illuminates the "how" questions, i.e. what is the current state of educational quality in schools and how can it be realistically improved with the available resources. It can also provide some insights into the why questions - why is the quality of education poor? (O'Sullivan, 2006).

However, lesson observations and audits are useful in highlighting individual teachers' needs and inform conversations amongst the teachers aiding the creation of mathematics-specific personalized development plans for teachers, (ACME, 2015). An activity that embodies all of these characteristics is lesson study under lesson observation. This professional development practice, which originated in Japan, engages teachers in a process of systematically examining their teaching, with the goal of becoming more effective. The process centers on teachers working collaboratively on a study lesson; first planning it, then teaching it, observing it, reflecting on it, critiquing it, revising it, and optionally repeating the process. To provide focus and direction throughout the process, the teachers select an overarching goal and related research question to explore. The research focus, as well as the collaborative qualities of lesson study and guidelines for peer observation, makes it the ideal candidate for fostering the development of observation skills that will positively affect future teaching, (ACME, 2015).

Moreover, lesson observation is considered by many Japanese educators as a process that gives teachers "the eyes to see children" (Lewis, 2002) and it facilitates the focused observation of learners, with an emphasis on gathering evidence about how the instruction, decisions and behaviors of the teacher affect learners thinking and learning. Lesson study through lesson observation has been established as a valuable model for improving teacher effectiveness (Chigeru, 2020), and has seen growing use at all levels, from in service and preservice teacher education to higher education. For preservice teachers, the practice serves as a mechanism for bridging theory and practice, and provides a means of initiating them into the practice of collaborative planning, teaching, observation and reflection (Burroughs & Luebeck, 2010; Chassels & Melville, 2009). With the use of lesson observation, it has demonstrated its value for producing lively exchanges of ideas about teaching and learning among the teachers in the department (Alvine et al., 2007). For all teachers, it provides opportunities to build professional learning communities, to learn from one another, and to think deeply about content, the way learners learn which are enacted with the creativity of the teachers put together (Tam, 2015).

However, the literature suggests that lesson observation possesses great potential as a powerful tool for facilitating teacher growth in content knowledge and understanding of curriculum, pedagogy, and student learning, and for developing habits of critical observation, analysis, and reflection (Burroughs & Luebeck, 2010; Chassels & Melville, 2009; Murata & Takahashi, 2002; Stigler & Hiebert, 1999). Besides, literature offers a few recommendations for making observation activities more effective (Acheson & Gall, 2003) viz; ensuring that the observer is provided with a focus for the observation and knows what to look for, that a specific procedure is used for the observation, and that the observer strictly maintains his or her role as an observer. In an ideal situation, lesson observation will focus on the development

of the mathematics and this will form the basis of the post-observation feedback conversation, (ACME, 2015). Lesson observation is like a spotlight, illuminating certain aspects of classroom life, while leaving others in darkness. A spotlight on the teacher can cast into shadow other salient aspects of classroom conditions which have a strong bearing on learning.

III. METHODOLOGY

The research design used in this study was the concurrent triangulation mixed- method design, (Creswell & Plano Clark, 2017) which compensated limitations of individual methods. The researcher employed that design to validate and increase the credibility of the findings while enhancing reliability and validity while providing a more nuanced understanding of the research problem, (Creswell & Plano Clark, 2017). The study was conducted in Chingola District. Two research questions guided the study. Purposive sampling was used to select six government secondary schools that were implementing the lesson study cycle. Thirty (30) teachers were selected using total sampling to ensure that all members from each department were included. Twelve (12) learners were chosen through purposive sampling based on their performance and fluency in English, the language being taught. Data collection methods included questionnaires, focus group discussions, and interviews. Data was analysed descriptively by use of the Statistical Package for Social Scientists (SPSS) and thematically by use of Nvivo.

IV. FINDINGS & DISCUSSION

This study examined the conduct of lesson observations and their impact on the quality of teaching and learning among mathematics teachers in Chingola District. The first focus was on how these teachers carried out the lesson observations.

4.1 Lesson Study Implementation

Data analysis revealed that although the schools involved had planned activities for lesson observation, the implementation fell short. The table below presents the number of lesson study cycles that were planned and implemented for the third term of 2023, broken down by school.

Table 1

Lesson Study Cycles Implementation Pattern

School	Planned	Implemented
A	4	3
B	2	1
C	2	1
D	3	1
E	2	1
F	2	1

Table 1 above shows that school A had planned for (four) lesson study cycles but implemented only three. School B planned for two cycles but completed just one, similar to schools C, E, and F. School D planned for three cycles but also implemented only one. These findings suggest a lack of good will and commitment to conducting lesson observations through the lesson study cycle. That aligns with Baba and Nakai's (2011) observation that not all schools in Zambia were effectively and consistently implementing stable lesson study. The MOE & UNICEF (2024) report further highlights challenges encountered during the lesson study, including a lack of consistency among teachers, reluctance to participate due to fears of negative feedback during reviews, demotivation from the absence of snacks and high workloads that affected the quality of lesson observations. It is important to note that the success of these observations relies not only on the teachers for their professional growth but also on the support from school administration. School managers play a significant role in providing the necessary logistics for the successful implementation of lesson study cycles. This supports Gold's (1998) assertion that the organisation of Continuing Professional Development (CPD) depends on the commitment and value that both school administration and teachers placed on it. The number of cycles conducted in a term in nearly all the schools under study did not align with the Ministry of Education's (2007) guidelines for SB CPD through Lesson Study, which state that lesson studies should be conducted at least once a month or three times per term at regular intervals. From table 1 above, it is evident that all the schools failed to implement the planned lesson observations. One of the Heads of Departments (HoDs) commented on the failed planned lesson observations;

“We failed to implement the planned cycles because of national examinations which were more important than the lesson cycles. Also government programme override school programme. As you can observe, most pupils are attending rehearsals for independence and won't be in school for a while”.

4.1.2 Lesson Observation Conduct

However, according to the Implementation Guidelines, while one team member teaches the lesson in a classroom, others are expected to observe and evaluate it. Each observer should focus on assigned points of observation, such as the lesson introduction, the teacher's questioning, lesson evaluation, the conclusion, and classroom management, (MoE, 2007:15). The study revealed that no lesson plans were circulated to the teachers observing the lessons which posed a challenge in focusing on the assigned evaluation points. Doig & Groves (2011) noted that in Japan, lesson plans were integral to the research lesson observation, with all observers provided with a hard copy of a detailed lesson plan. Additionally, Fujii (2014) emphasized that one function of the lesson plan was to shift the focus from the teacher to teaching during observation and post-lesson discussions (critique), making it and becomes more beneficial when made available beforehand. The study found that while all the demo teachers had lesson plans (which were not shared with the observers), only three schools provided an evaluation form for the lesson. The *Teaching Skills Book* states that the lesson plan should be used when observing the lesson. It states:

“The lesson plan shows the ability of a teacher. The advice to be offered and the skills of a teacher are dependent on the lesson plan. It is important to have a lesson plan in order to complete the evaluation” (MoE, 2009:13)

It was also found that only three schools were able to evaluate their lessons using evaluation forms. Of these, the forms from School A and School B were identical, while the form from School E was completely different. The HODs from the three schools that did not provide any evaluation forms had the following to say;

HOD C: “We don't use any instrument for lesson observation.”

HOD D: “No instrument is used for observation and teachers only take notes of what they observe on the pieces of paper.”

HOD F: “We have no specific form for observation. Teachers write their observations on the pieces of paper.”

It was found that in schools without any forms of evaluation, some teachers were observed taking notes on small pieces of paper to use during lesson critique time. Even in schools that did not use evaluation forms, there was a lack of uniformity among them. The report from the MoE and UNICEF (2024) on SB CPD materials revealed bewildering variety of over 20 guides, books, brochures, manuals, and booklets, most of which lacked consistency and did not complement each other. This inconsistency contributed to the uneven implementation of SB CPD activities in schools. Additionally, the absence of standardized evaluation forms and circulating lesson plans negatively impacted the quality of post- lesson discussions.

It was observed that teachers had no written notes to refer to during post discussions from all the schools under study. This was as a result of lack of assigned task to be observed during lesson observation against the stipulated implementations guidelines (MoE, 2007:15), that points of observation were to be assigned before the commencement of the lesson. MOE & UNICEF (2024) report also added that among the challenges encountered during the LS were; lack of consistency from the teachers, teachers shunning participation to avoid negative comments during reviews, demotivation due to lack of provision of snacks and high workloads affected the quality of lesson observations.

The study also noted significant disturbances caused by the ringtones teachers' phones. Instead of keeping their phones on silent, they continued to ring during the observations, compounded by teachers moving around the classroom. Additionally, some teachers arrived late while others left before the lesson concluded. The researcher observed that time management was poor, as lessons rarely started on time. Lewis and Hurd (2011) outlined a five-step procedure for observing a research, which includes respecting the classroom atmosphere (keeping phones silent, avoiding side conversations, arriving on time, staying for the entire class, and refraining from assisting learners or interfering with the natural flow of the lesson. These guidelines were intended to minimise disruption and allow for focused observation.

4.1.3 Enhancement of Teaching and Learning

The study also explored how lesson observations enhanced the quality of teaching and learning. Findings from School A revealed valuable lessons learned from observations which greatly aided in mentoring teachers. The Head of Department from School A further stated that both new and experienced teachers found the process very helpful for lesson planning. He remarked:

HOD A: “Teachers learn a lot and this is noticed in the way they plan and teach. Teachers learn practical ways of lesson delivery away from the theories learnt at college or universities.”

The HOD from School A emphasized the importance of lesson study through lesson observation, describing it as a game changer in lesson planning and delivery. He stated that the program should not merely be an academic exercise but should be implemented in practice. At school A, it was noted that there were fewer challenges in lesson

observation compared to the past, as teachers were now more willing to learn, focusing on the lesson rather than the teacher. The HOD recommended increasing the frequency of lesson observations to enhance the quality of planning and delivery. Similarly, at School B, it was observed that during lesson observations, teachers gained valuable knowledge, which they then passed on to their students. The skills and approaches they learned were also applied in their own classrooms. The HOD from school B had School B remarked;

HOD B: "The effects of lesson observation are noticed in the improvements in planning, delivery and teaching during lessons. For those teachers who attend the observations, you trace the positive effects in the planning and delivery of lessons."

The HOD from School B further stated that lesson observations improved the effectiveness of teachers in the way they delivering their lessons. He also emphasised the need for more observations each term to enhance interaction among the teachers.

From School C, the HOD observed that lesson observations contributed to the capacity building of the teachers and noted significant improvements in lesson planning and delivery. He further stated that lesson observations also help boost teachers' confidence. Below is an excerpt from the HOD from School C;

HOD C: "What we learn from college or university was different, so lesson study through lesson observation helps teachers to capacity build teachers. I have learnt a lot through lesson study under lesson observation from my former HOD as he was the only teacher teaching Additional mathematics (Addma). Through lesson observations I learnt how to plan, teach and delivery Addma lessons to my learners. Iam now mentoring some teachers."

Similarly, the HOD from School D observed gradual improvements in lesson planning, noting that teachers were now able to teach topics they had previously found challenging. School E made similar observations regarding lesson observations, highlighting their use for mentorship and the capacity building of teachers in new skills, methods, and approaches. The HOD from School E stated;

HOD E: "I had one teacher who had challenges in teaching senior grades but after these lesson observations, she is now more than able to prepare and deliver lessons to senior classes. Having a degree is different from actual teaching, so lesson observation is an avenue for mentorship of the teachers."

The HOD from School F also mentioned that a significant amount of mentoring occurs through lesson observations, allowing teachers to learn new strategies, ideas and methods. He said emphasised that there is no distinction between Newly Qualified Teachers (NQT) and experienced; everyone was mentored through capacity building. The HOD from School F provided the following excerpt;

HOD F: "Like today (during observation) I learnt something new on the slash as slash. I never knew that before, so it is capacity building each other. Learning such brings confidence as you teach your classes."

From the information above, it is clear that lesson observation significantly impacted teacher mentorship regarding lesson planning and delivery.

The study also highlighted the perceived effects of lesson observation on the quality of teaching and learning. Insights from FGD A indicated that teachers learned new methods, skills, and approaches that enhanced the quality of lesson delivery. The FGD A stated;

FGD A: "Like today I learnt a new method when teaching inequalities on linear programming for the line cutting both the x and y axes without finding gradient. I can't wait to teach it in my classes."

The FGD A stated that they currently needed a lesson demonstration on vector equations to help them deliver quality lessons to their students, confirming some benefits derived from lesson observations. They argued that the newly acquired skills contribute to effective teaching and learning. They revealed that when teachers are equipped with new skills, methods and approaches it enhances classroom delivery, which in turn improves the quality of learning. They also noted that when lesson observations are well organized and thoughtfully conducted, learners consistently appreciate and benefit from instruction.

In FGD B made similar observations, indicating that when they equip themselves with new approaches, skills, methods and strategies, it enhances the quality of teaching and learning. They further pointed out that during the lesson observations, they discussed the best approaches and teaching/learning aids to improve the quality of instruction. FGD C provided the following excerpt;

FGD C: "learning new concepts, approaches and methods help improve delivery which in turn improves the quality of teaching and learning. Perceived mistakes and errors are ironed out. Those observing and the presenter are both capacity built to improve teaching and learning."

The FGD D participants noted that learning new methods, skills and approaches for presenting challenging topics motivated teachers and positively impacted the quality of teaching and learning. They stated that lesson observations helped teachers develop techniques for addressing these challenging topics, which improved classroom delivery. Additionally, they mentioned that once teachers gained knowledge of the subject matter, their confidence in

teaching increased, thereby enhancing both teaching and learning. This enabled learners to grasp challenging topics through simplified teaching methods.

The observation from FGD E and FGD F echoed those from the other FGDs, highlighting how acquisition of new skills and methods helped teachers deliver quality lessons, resulting in improved learning outcomes. They also emphasised that lesson observations contributed to teachers' capacity to handle challenging topics, further enhancing the quality of teaching and learning. As teachers engaged in the lesson observation process, they found numerous opportunities for capacity building their understanding of mathematics and effective teaching strategies (ACME, 2015). The knowledge gained was applied directly to the classroom context. Observing and analyzing others' lesson allowed teachers to gain a better understanding of students' thought processes and learning of mathematical concept, as well as a broader perspective on teaching ideas and pedagogy (Lomibao, 2016).

Moreover, the literature suggests that observation is a powerful tool for fostering teacher growth in content, knowledge, curriculum understanding, pedagogy, and student learning. It helps develop critical observation, analysis, and reflection habits (Burroughs & Luebeck, 2010; Chassels & Melville, 2009; Murata & Takahashi, 2002; Stigler & Hiebert, 1999). Lesson observation significantly impacts the mentorship of teachers a lesson study leading to improved lesson planning and delivery. It was important to note that the success of these observations relied on the teachers themselves for their professional growth but also on the support from the school administration.

Research indicates that when conducted effectively, peer observation, including feedback and reflection has a substantial impact on enhancing professional practice and can be a vital component of a teachers' professional development. Peer observation benefits both the observed teacher and the observer. It can facilitate opportunities to discuss challenges and successes with trusted colleagues, encourage the sharing of ideas and expertise among teachers, and build a community of trust by opening classroom practices to a broader audience, focus on improving learning outcomes, and contribute to the collective efficacy of the entire whole school.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study examined how Mathematics teachers conducted lesson observations and how this practice enhanced the quality of teaching and learning in the lesson study cycle in Chingola District, Zambia. It was found out that lesson observations were conducted or implemented in accordance with the guidelines set by the Ministry of Education. The study concluded that lesson observation practices within the lesson study cycle have significant potential to improve the quality of teaching and learning in mathematics. Positive impacts on teacher mentorship and collaboration through lesson observation were evident. However, inconsistent implementation, insufficient adherence to guidelines, and limited teacher collaboration undermined its overall effectiveness.

5.2 Recommendations

Based on the findings and conclusions of the study, several recommendations are proposed. Firstly, it is essential to strengthen adherence to lesson study guidelines at all stages of implementation. This would ensure that the structured approach to lesson planning, execution and evaluation is consistently adhered to, thereby maximizing the benefits of the lesson study methodology.

Furthermore, enhancing teacher collaboration through regular, structured professional development sessions is recommended. By providing opportunities for teachers to engage in ongoing learning and best practices, schools can foster a culture of collaboration and continuous improvement. This, in turn, would support the effective implementation of lesson observation and contribute to enhanced teaching and learning outcomes.

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