Influence of microteaching on the development of differentiated instruction skills among christian religious education pre-service teachers in public universities in Kenya

Naomi Jebungei Kutto

naomikutto@gmail.com

University of Eldoret, Kenya

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ABSTRACT

Microteaching has increasingly become an essential pedagogical strategy in teacher education because it enables pre-service teachers to acquire practical instructional competencies before entering actual classroom environments. Despite its widespread use, limited empirical evidence exists regarding its effectiveness in developing differentiated instruction skills required for inclusive education, particularly among Christian Religious Education (CRE) pre-service teachers in Kenya. This study examined the influence of microteaching on the development of differentiation skills among CRE pre-service teachers in public universities in Kenya. Guided by Vygotsky's Sociocultural Theory of Learning, the study investigated whether microteaching enhances differentiation of content, process, product, and learning environment during classroom instruction. The study adopted a quasi-experimental pretest-posttest design within the post-positivist paradigm. Sixty CRE pre-service teachers participated in two consecutive microteaching sessions during which they were observed using a structured observation schedule. The first session constituted the pre-test, while the second session followed feedback, reflection, peer critique, and lesson revision. Quantitative data were analysed using paired sample t-tests. The findings revealed statistically significant improvements in all four dimensions of differentiated instruction. Significant gains were observed in content differentiation ($t=6.497$, $p<0.001$), process differentiation ($t=6.332$, $p<0.001$), product differentiation ($t=7.863$, $p<0.001$), and learning environment differentiation ($t=7.743$, $p<0.001$). These findings demonstrate that structured microteaching significantly enhances pre-service teachers' ability to accommodate learner diversity during instruction. The study concludes that microteaching is an effective pedagogical approach for preparing future CRE teachers to implement inclusive instructional practices in Kenyan secondary schools. It recommends strengthening microteaching programmes through increased instructional resources, structured reflective practice, and explicit integration of differentiated instruction competencies into teacher education curricula.

Keywords: Differentiated Instruction, Inclusive Education, Microteaching, Pre-Service Teachers

I. INTRODUCTION

Teacher education programmes are increasingly expected to prepare pre-service teachers with the competencies required to address learner diversity in inclusive classrooms. As inclusive education expands globally, attention has shifted from increasing access to ensuring equitable participation and meaningful learning for students with diverse abilities, interests, and learning needs (UNESCO, 2021; OECD, 2023). Consequently, differentiated instruction has become a fundamental pedagogical approach that enables teachers to adapt content, instructional processes, learning activities, assessment, and classroom environments to accommodate learners' varying readiness levels and learning profiles (Tomlinson, 2017). Research indicates that differentiated instruction enhances learner engagement, academic achievement, and participation while promoting inclusive classroom practices (Pozas et al., 2020; Suprayogi et al., 2018).

In Kenya, the implementation of inclusive education through the Competency-Based Curriculum (CBC) has heightened the demand for teachers capable of differentiating instruction. However, studies indicate that many teachers continue to rely on teacher-centred approaches, largely because they receive limited practical preparation in differentiated instructional strategies during teacher education (Momanyi & Rop, 2019; Kubai, 2023). This challenge is particularly evident in Christian Religious Education (CRE), where effective instruction extends beyond content delivery to nurturing learners' values, attitudes, moral reasoning, and spiritual development. Such learning outcomes require teachers to employ flexible instructional approaches that respond to learners' diverse needs.

Microteaching has been widely recognised as an effective strategy for developing practical teaching competencies by enabling pre-service teachers to plan, teach, receive feedback, reflect, and reteach lessons within a controlled environment (Kılıç, 2022). While previous studies have demonstrated its effectiveness in improving general teaching skills (Baştürk & Çelik, 2023), limited empirical evidence exists on its influence in developing differentiated instruction skills among CRE pre-service teachers. Guided by Vygotsky's Sociocultural Theory of Learning, this study examined whether microteaching significantly enhances content, process, product, and learning environment differentiation among Christian Religious Education pre-service teachers in public universities in Kenya. This evidence

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is essential for strengthening teacher education programmes and improving preparedness for inclusive classroom practice.

1.1 Statement of the Problem

The implementation of inclusive education has increased the demand for teachers who can effectively differentiate instruction to address learners' diverse abilities, interests, and learning needs. Although differentiated instruction is recognized as a fundamental competency for inclusive teaching, evidence suggests that many pre-service teachers graduate with inadequate practical skills to adapt content, instructional processes, learning products, and classroom environments to diverse learners (Pozas et al., 2020; UNESCO, 2021). In Kenya, despite reforms promoting learner-centred pedagogy through the Competency-Based Curriculum (CBC), teacher education programmes continue to face challenges such as limited instructional resources, large class sizes, and insufficient opportunities for practical application of differentiated instructional strategies (Kubai, 2023; Momanyi & Rop, 2019).

Microteaching has been widely adopted in teacher education to enhance instructional competence through repeated teaching, feedback, reflection, and re-teaching. While previous studies have established its effectiveness in improving general teaching skills, classroom management, and instructional confidence (Kılıç, 2022; Baştürk & Çelik, 2023), there is limited empirical evidence regarding its influence on developing differentiated instruction skills, particularly among Christian Religious Education (CRE) pre-service teachers in Kenyan public universities. Consequently, it remains unclear whether participation in microteaching significantly improves teachers' ability to differentiate content, process, product, and learning environment during instruction. This study therefore sought to bridge this knowledge gap by examining the influence of microteaching on the development of differentiated instruction skills among CRE pre-service teachers in public universities in Kenya.

1.2 Research Objective

i. To determine the influence of microteaching on content differentiation among Christian Religious Education pre-service teachers in public universities in Kenya.
ii. To establish the influence of microteaching on process differentiation among Christian Religious Education pre-service teachers in public universities in Kenya.
iii. To examine the influence of microteaching on product differentiation among Christian Religious Education pre-service teachers in public universities in Kenya.
iv. To determine the influence of microteaching on learning environment differentiation among Christian Religious Education pre-service teachers in public universities in Kenya.

II. LITERATURE REVIEW

2.1 Theoretical Review

This study was anchored on Vygotsky's Sociocultural Theory of Learning, developed by Lev Vygotsky in 1978. The theory posits that learning is fundamentally a social process in which knowledge is constructed through interaction with more knowledgeable others within a specific cultural context. According to Vygotsky (1978), cognitive development occurs through guided participation, dialogue, collaboration, and scaffolding, enabling learners to progress from what they can accomplish independently to what they can achieve with support. This progression is conceptualized as the Zone of Proximal Development (ZPD), which represents the difference between a learner's current level of competence and their potential level of performance under appropriate guidance.

The theory emphasizes that learning is enhanced when teachers provide instructional support tailored to learners' individual needs, readiness levels, and experiences. Such support is gradually withdrawn as learners gain competence, allowing them to become independent thinkers and problem-solvers. Consequently, effective teaching requires teachers to recognize learner diversity and adapt instructional strategies to maximize learning opportunities for every student. This perspective closely aligns with differentiated instruction, which advocates modifying instructional content, teaching processes, learning products, and classroom environments according to learners' readiness, interests, and learning profiles (Tomlinson, 2017).

Microteaching embodies the principles of Sociocultural Theory by providing pre-service teachers with structured opportunities to learn through observation, collaboration, reflection, peer feedback, and guided practice. During microteaching sessions, teacher educators and peers function as the "more knowledgeable others" who provide constructive feedback that enables novice teachers to improve their instructional competence. The cycle of planning, teaching, receiving feedback, reflecting, revising, and reteaching creates a scaffolded learning environment that supports professional growth and facilitates mastery of effective teaching practices (Reddy, 2019).

In the context of Christian Religious Education (CRE), differentiated instruction is particularly important because learners differ in their prior religious knowledge, cultural backgrounds, values, learning preferences, and cognitive abilities. Teachers are therefore expected to employ diverse instructional approaches that facilitate meaningful

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participation and understanding among all learners. Through repeated microteaching experiences, pre-service teachers gradually develop the competence to differentiate instructional content, learning activities, learner products, and classroom environments to accommodate this diversity. The theory is therefore appropriate for this study because it explains how guided practice and reflective feedback during microteaching contribute to the acquisition of differentiated instructional skills. It provides a theoretical basis for understanding how collaborative learning experiences within teacher education programmes enhance pre-service teachers' capacity to implement inclusive teaching practices in actual classroom settings.

2.2 Empirical Review

2.2.1 Microteaching and Content Differentiation

Content differentiation involves adapting instructional materials, resources, and learning experiences to address learners' varying abilities, interests, and prior knowledge (Tomlinson, 2017). Empirical studies indicate that practical teaching experiences enhance teachers' ability to modify instructional content. Kılıç (2022) established that microteaching improved lesson planning, instructional resource selection, and delivery among pre-service teachers. Similarly, Pozas et al. (2020) found that teachers exposed to differentiated instruction training demonstrated improved competence in selecting appropriate learning materials for diverse learners.

In Kenya, however, implementation of learner-centred approaches promoted under the Competency-Based Curriculum remains constrained by limited practical preparation and inadequate application of differentiation strategies among teachers (Momanyi & Rop, 2019; Kubai, 2023). This suggests the need to examine how microteaching contributes to content differentiation among CRE pre-service teachers.

2.2.2 Microteaching and Process Differentiation

Process differentiation focuses on varying instructional methods, learning activities, classroom interactions, and teaching strategies according to learners' needs (Tomlinson, 2017). Studies show that microteaching enhances instructional flexibility through repeated practice, observation, and feedback. Kubai (2023) reported that microteaching improved questioning skills, learner engagement strategies, and instructional delivery among pre-service teachers.

Similarly, Suprayogi et al. (2018) established that teachers trained in differentiated instruction were better able to apply flexible grouping, scaffolding, and varied instructional approaches. However, limited evidence exists on how microteaching influences process differentiation among CRE pre-service teachers in Kenyan public universities.

2.2.3 Microteaching and Product Differentiation

Product differentiation involves providing learners with varied ways of demonstrating knowledge, understanding, and skills through assessment tasks and learning outputs (Tomlinson, 2017). Research indicates that differentiated instruction training enhances teachers' ability to design diverse assessment approaches that accommodate learner differences.

Pozas et al. (2020) found that teachers with exposure to differentiated instruction were more likely to develop varied assessment activities. Further, Irvan et al. (2023) demonstrated that authentic teaching experiences strengthen teachers' ability to connect theoretical knowledge with classroom practice. Despite these findings, the influence of microteaching on product differentiation among CRE pre-service teachers remains inadequately documented.

2.2.4 Microteaching and Learning Environment Differentiation

Learning environment differentiation involves creating flexible, inclusive, and supportive classroom conditions that promote participation among diverse learners (Tomlinson, 2017). UNESCO (2023) emphasizes that inclusive classrooms require teachers to establish supportive environments that recognize learner diversity.

Hidayati (2022) found that reflective teaching experiences improve teachers' capacity to create learner-centred classroom environments. However, evidence regarding the contribution of microteaching to learning environment differentiation among CRE pre-service teachers in Kenyan universities remains limited. Therefore, this study examines whether microteaching enhances the ability of CRE pre-service teachers to create inclusive learning environments.

III. METHODOLOGY

3.1 Research Design

The study adopted a quasi-experimental research design anchored within the post-positivist paradigm to determine the influence of microteaching on the development of differentiated instruction skills among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. The quasi-experimental design was appropriate because participants were drawn from existing microteaching groups and could not be randomly assigned to experimental conditions (Creswell & Creswell, 2017). Specifically, the study employed a one-group pre-test–post-test design, which enabled the comparison of participants' differentiated instruction skills before and after the microteaching intervention.

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3.2 Study Area

The study was conducted in selected public universities in Kenya offering Bachelor of Education programmes with Christian Religious Education as a teaching subject. The universities provided an appropriate setting because pre-service teachers undertake microteaching as part of their professional teacher preparation. The study focused on CRE pre-service teachers enrolled in microteaching programmes, where they were expected to develop practical pedagogical competencies, including the ability to differentiate instruction to address diverse learner needs.

3.3 Target Population

The target population comprised CRE pre-service teachers enrolled in selected public universities in Kenya and undertaking Bachelor of Education programmes. The study specifically targeted students who had undertaken or were undertaking the microteaching course. These participants were considered appropriate because microteaching provides an opportunity for pre-service teachers to practice, receive feedback, reflect on their teaching, and improve their instructional competencies before engaging in actual classroom teaching.

3.4 Sampling and Sample Size

The study involved a sample of 60 CRE pre-service teachers who had undertaken the microteaching course. The participants constituted an intact microteaching class and were selected purposively because they were directly involved in the intervention under investigation. The use of an intact group was appropriate for the quasi-experimental design since the participants could not be randomly assigned to different experimental conditions. All the 60 participants were assessed during both the pre-test and post-test phases.

3.5 Data Collection Instruments

Data were collected using a structured observation protocol developed based on the principles of differentiated instruction advanced by Tomlinson (2017). The observation protocol was designed to assess the participants' ability to modify their instructional practices to accommodate learner diversity. The instrument comprised four sections corresponding to the major dimensions of differentiated instruction: content differentiation, process differentiation, product differentiation, and learning environment differentiation. Each section contained observable indicators used to assess the extent to which participants applied differentiated instructional strategies during microteaching sessions.

The intervention followed the conventional microteaching cycle, involving lesson planning, classroom presentation, observation, structured feedback, reflection, lesson revision, and re-teaching. During the initial session, participants conducted a micro-lesson that was observed to establish baseline differentiation competencies during the pre-test. Participants subsequently received constructive feedback from peers and teacher educators regarding their strengths and areas requiring improvement. They then revised their lesson plans and conducted a second microteaching session, during which their differentiated instruction skills were reassessed as the post-test. The same observation protocol was administered during both the pre-test and post-test sessions to ensure consistency and comparability of observations. Content validity was established through expert review by specialists in curriculum studies and teacher education. Reliability was enhanced through standardized observation procedures and consistent scoring across the two instructional sessions.

3.6 Data Analysis

Quantitative data were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including means and standard deviations, were used to summarize participants' differentiated instruction skills during the pre-test and post-test phases. Inferential analysis was conducted using the paired-samples t-test to determine whether there were statistically significant differences between participants' pre-test and post-test scores. The paired-samples t-test was appropriate because the study involved two related measurements obtained from the same participants before and after the microteaching intervention (Field, 2018). Statistical significance was evaluated at the 0.05 level of significance. The null hypotheses were rejected where the probability value (p) was less than 0.05 and retained where the probability value was greater than or equal to 0.05. The findings were presented and interpreted according to the four study objectives and corresponding hypotheses.

3.7 Ethical Considerations

The study adhered to relevant ethical principles governing research involving human participants. Ethical approval and permission to conduct the study were obtained from the relevant university authorities before the commencement of data collection. Participation was voluntary, and participants were informed about the purpose and procedures of the study. Participants were assured of confidentiality and anonymity, and no personally identifying information was included in the presentation of the findings. The participants were also informed of their right to

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withdraw from the study without any penalty. The data collected were used strictly for academic purposes and handled securely to protect the privacy of the participants.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Influence of Microteaching on Content Differentiation

The first objective sought to determine the influence of microteaching on content differentiation among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. Specifically, the study examined whether participation in the microteaching cycle significantly improved pre-service teachers' ability to adapt instructional content to learners with diverse needs. Six indicators were assessed, namely: use of reading materials at varying readability levels, highlighting key points, use of manipulatives, presenting ideas through auditory and visual approaches, meeting with small groups to reteach concepts, and the overall content differentiation score.

Table 1

Paired Samples t-Test for Content Differentiation (n = 60)

Content Differentiation Indicator	Mean Difference	t	df	p-value
Using reading materials at varying readability levels	1.003	6.239	59	.000
Highlighting key points	0.617	4.204	59	.000
Using manipulatives	0.633	3.974	59	.000
Presenting ideas through auditory and visual means	0.650	4.773	59	.000
Meeting with small groups to reteach concepts	0.683	4.310	59	.000
Overall Content Differentiation	**0.717**	**6.497**	**59**	**.000**

The results presented in Table 1 indicate statistically significant improvements across all indicators of content differentiation following participation in the microteaching programme. The greatest improvement was observed in the use of reading materials at varying readability levels (Mean Difference = 1.003, $t = 6.239$, $p < .001$), suggesting that after receiving structured feedback and engaging in reflective practice, pre-service teachers became more competent in selecting instructional materials appropriate for learners with varying academic abilities. Significant improvements were also observed in highlighting key instructional points ($t = 4.204$, $p < .001$), using manipulatives during instruction ($t = 3.974$, $p < .001$), presenting ideas through both auditory and visual approaches ($t = 4.773$, $p < .001$), and conducting small-group re-teaching sessions ($t = 4.310$, $p < .001$).

The overall analysis demonstrated that microteaching produced a statistically significant improvement in content differentiation ($t(59) = 6.497$, $p < .001$; Cohen's $d = 0.839$), indicating a large practical effect. Since the probability value was below the predetermined significance level of 0.05, the null hypothesis (H_{01}), which stated that microteaching has no significant influence on content differentiation among CRE pre-service teachers, was rejected. The study therefore concludes that participation in structured microteaching significantly enhances pre-service teachers' competence in differentiating instructional content.

The findings suggest that the iterative process of lesson planning, classroom presentation, peer observation, feedback, reflection, and re-teaching enabled participants to critically evaluate their instructional practices and improve their ability to modify learning materials to accommodate learner diversity. Through repeated exposure to constructive feedback from peers and teacher educators, pre-service teachers became more aware of the importance of selecting instructional resources that address different learner abilities and learning preferences. This finding demonstrates that microteaching extends beyond improving general teaching techniques to strengthening competencies directly associated with inclusive classroom practice.

The findings corroborate those of Bakır (2014), who reported that microteaching significantly enhanced pre-service teachers' lesson organization, instructional delivery, and utilization of teaching resources. Similarly, Reddy (2019) observed that the reflective nature of microteaching enables novice teachers to refine instructional strategies through continuous feedback and practice. The present findings also agree with Pozas *et al.* (2020), who found that teachers with practical exposure to differentiated instruction were more capable of adapting instructional content to learners' varying readiness levels than those relying solely on theoretical preparation.

The results further support Tomlinson (2017) proposition that effective content differentiation requires teachers to modify instructional materials according to learners' readiness, interests, and learning profiles. The observed improvement in the use of varied instructional resources, audiovisual materials, and small-group instruction demonstrates that microteaching provided opportunities for pre-service teachers to operationalize these principles within authentic teaching situations. Such improvements are particularly important in Christian Religious Education, where

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abstract concepts—including faith, morality, forgiveness, stewardship, and spirituality—require multiple instructional approaches to facilitate learner understanding.

The findings are equally consistent with Vygotsky's Sociocultural Theory, which underpinned the study. According to Vygotsky (1978), learning occurs through guided interaction with more knowledgeable individuals within the learner's Zone of Proximal Development. During the microteaching programme, teacher educators and peers provided scaffolding through observation, critique, and reflective dialogue, enabling participants to refine their instructional practices progressively. This collaborative learning environment facilitated the acquisition of differentiated content delivery skills that participants successfully applied during the second microteaching session.

Within the Kenyan context, the findings address concerns raised by Situma (2016) and Kimosop (2014) that Christian Religious Education instruction remains predominantly teacher-centred and heavily dependent on textbooks. The significant improvements observed after the microteaching intervention demonstrate that structured practical experiences can effectively address these shortcomings by equipping pre-service teachers with competencies required to implement learner-centred and inclusive instructional approaches. Consequently, strengthening microteaching programmes within teacher education institutions has the potential to improve classroom practice and enhance the quality of inclusive education in Kenyan secondary schools.

Overall, the findings provide compelling empirical evidence that microteaching is an effective pedagogical strategy for developing content differentiation skills among CRE pre-service teachers. The study therefore recommends that teacher education programmes allocate sufficient time and resources to microteaching activities and deliberately integrate differentiated instruction competencies into lesson planning, observation, feedback, and assessment processes to better prepare future teachers for increasingly diverse classrooms.

4.1.2 Influence of Microteaching on Process Differentiation

The second objective sought to establish the influence of microteaching on process differentiation among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. Process differentiation involves varying instructional approaches, learning activities, pacing, and classroom interactions to accommodate learners' diverse abilities, interests, and learning preferences. During the study, participants were assessed on their ability to use tiered activities, provide interest centres, optimize learners' experiences, vary the pace of instruction, and adapt activities to individual learning styles.

Table 2

Paired Samples t-Test for Process Differentiation (n = 60)

Process Differentiation Indicator	Mean Difference	t	df	p-value
Using tiered activities	0.976	6.040	59	.000
Providing interest centres	0.567	4.067	59	.000
Optimizing learner experiences	0.567	3.752	59	.000
Varying the pace of work	0.567	4.476	59	.000
Adapting activities to learning styles	0.550	3.888	59	.000
Overall Process Differentiation	**0.645**	**6.332**	**59**	**.000**

The findings indicate statistically significant improvements across all indicators of process differentiation following participation in the microteaching programme. The largest improvement was observed in the use of tiered activities (Mean Difference = 0.976, $t = 6.040$, $p < .001$), while significant gains were also recorded in providing interest centres, optimizing learner experiences, varying instructional pace, and adapting learning activities to different learning styles. Overall, the paired-samples t-test showed that microteaching significantly improved process differentiation among CRE pre-service teachers ($t(59) = 6.332$, $p < .001$; Cohen's $d = 0.817$). Consequently, the null hypothesis (H_{02}), which stated that microteaching has no significant influence on process differentiation, was rejected.

The observed improvement demonstrates that repeated cycles of planning, teaching, observation, feedback, reflection, and re-teaching enabled pre-service teachers to refine instructional processes that accommodate learner diversity. Through reflective practice and peer evaluation, participants became more competent in selecting learner-centred instructional approaches and adjusting classroom activities according to learners' readiness and learning preferences. This finding suggests that microteaching provides an authentic learning environment where theoretical principles of differentiated instruction are translated into practical classroom competencies.

The findings are consistent with Darling-Hammond and Hyler (2020), who argue that effective teacher preparation programmes should emphasize practice-based learning experiences that enable pre-service teachers to experiment with instructional strategies and improve their pedagogical decision-making through continuous feedback. Similarly, Hattie (2023) observes that structured feedback is one of the most influential factors in improving instructional practice because it enables teachers to reflect critically on their classroom performance and make evidence-based

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instructional adjustments. The significant improvements observed in this study demonstrate the value of feedback in strengthening teachers' capacity to differentiate instructional processes.

The results further support the work of Deunk et al. (2018), whose meta-analysis found that adaptive instruction significantly improves learner engagement and achievement when teachers modify teaching approaches to accommodate learners' varying educational needs. Likewise, Suprayogi et al. (2018) established that teachers who receive practical preparation in differentiated instruction are more likely to vary instructional strategies, organize flexible learning activities, and provide individualized support than those with limited practical experience. These findings suggest that differentiated instructional processes are strengthened through experiential learning rather than theoretical knowledge alone.

From the perspective of Vygotsky's Sociocultural Theory, the findings illustrate how collaborative learning and guided support facilitate professional growth. During the microteaching sessions, teacher educators and peers acted as more knowledgeable others by providing scaffolding through observation, dialogue, and constructive critique. These interactions enabled participants to progress within their Zone of Proximal Development, thereby improving their ability to organize learning experiences that accommodate learner diversity. The significant improvement observed between the pre-test and post-test therefore reflects the effectiveness of socially mediated learning in developing differentiated instructional competencies.

Within the Kenyan context, the findings demonstrate that microteaching can strengthen the implementation of learner-centred pedagogy envisaged under the Competency-Based Curriculum. By improving teachers' ability to vary instructional processes, microteaching contributes to preparing CRE teachers capable of responding effectively to increasingly diverse classrooms. Universities should therefore strengthen reflective practice, peer mentoring, and structured feedback within microteaching programmes to enhance pre-service teachers' competence in process differentiation and inclusive instruction.

4.1.3 Influence of Microteaching on Product Differentiation

The third objective sought to determine the influence of microteaching on product differentiation among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. Product differentiation refers to the various ways through which learners demonstrate their understanding, application of knowledge, skills acquisition, and achievement of learning outcomes. In differentiated classrooms, learners are provided with multiple opportunities to express their learning according to their abilities, interests, and strengths. The study assessed participants' ability to focus learners on real-world applications, connect theory to practice, scaffold and support learners, encourage creativity, and the overall product differentiation competency.

Table 3

Paired Samples t-Test for Product Differentiation (n = 60)

Product Differentiation Indicator	Mean Difference	t	df	p-value
Focusing learners on real-world applications	1.103	6.835	59	.000
Connecting theory to practice	0.750	4.891	59	.000
Scaffolding and supporting learners	0.717	4.490	59	.000
Encouraging creativity	0.783	5.818	59	.000
Overall Product Differentiation	**0.838**	**7.863**	**59**	**.000**

The findings presented in Table 3 reveal statistically significant improvements across all indicators of product differentiation following participation in the microteaching programme. The greatest improvement was observed in focusing learners on real-world applications (Mean Difference = 1.103, $t = 6.835$, $p < .001$), indicating that pre-service teachers became more capable of designing learning experiences that enabled students to apply religious concepts to practical life situations. Significant improvements were also recorded in connecting theory to practice ($t = 4.891$, $p < .001$), scaffolding and supporting learners ($t = 4.490$, $p < .001$), and encouraging creativity ($t = 5.818$, $p < .001$).

The overall analysis demonstrated that microteaching significantly improved product differentiation among CRE pre-service teachers ($t(59) = 7.863$, $p < .001$; Cohen's $d = 1.015$). Since the probability value was less than the threshold of 0.05, the null hypothesis (H_{03}), which stated that microteaching has no significant influence on product differentiation among CRE pre-service teachers, was rejected. The study therefore concludes that microteaching positively and significantly influences the development of product differentiation skills.

The significant improvement in product differentiation suggests that the microteaching experience enhanced participants' ability to design learning outcomes that move beyond rote memorization towards application, analysis, creativity, and reflection. Through repeated teaching, observation, and feedback sessions, pre-service teachers learned how to provide learners with alternative ways of demonstrating knowledge and understanding. The findings indicate that microteaching exposed participants to reflective teaching practices that encouraged them to consider learner differences when designing assessment tasks and learning products.

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These findings are consistent with Brookhart (2017), who argues that effective assessment practices require teachers to provide learners with varied opportunities to demonstrate understanding through projects, presentations, discussions, portfolios, and practical tasks. Similarly, Heritage (2013) contends that instructional improvement occurs when teachers continuously align learning activities and assessment products with learners' strengths and learning needs. The improvements observed in this study suggest that microteaching enabled participants to internalize these principles and apply them during subsequent instructional sessions.

The findings also support the work of Guskey (2020), who observed that continuous feedback and reflective teaching significantly improve teachers' ability to design meaningful learning outcomes and authentic assessment tasks. Likewise, Reddy (2019) emphasizes that contemporary teacher education should prepare teachers to foster creativity, problem-solving, critical thinking, and real-world application of knowledge among learners. The significant gains observed in encouraging creativity and connecting theory to practice demonstrate that microteaching contributes to the acquisition of these competencies among future teachers.

From the perspective of Christian Religious Education, the findings are particularly significant because CRE seeks not only to transmit biblical knowledge but also to cultivate values, ethical behaviour, spiritual growth, and responsible citizenship. Consequently, effective CRE instruction requires teachers to design learning activities that enable learners to apply religious teachings to everyday situations. The observed improvement in real-world application suggests that microteaching strengthened participants' capacity to transform abstract religious concepts into meaningful learning experiences. Such competencies are essential for helping learners connect scriptural teachings with contemporary social, moral, and ethical challenges.

The findings further align with Situma (2016), who emphasizes learning through concrete experience, reflection, conceptualization, and active experimentation. The microteaching cycle mirrors these stages by providing opportunities for pre-service teachers to teach, reflect on feedback, revise instructional approaches, and reteach improved lessons. Through this experiential process, participants developed stronger competencies in designing differentiated learning products that address learner diversity.

Within the Kenyan educational context, the findings contribute to ongoing efforts to implement learner-centred approaches under the Competency-Based Curriculum. CBC emphasizes demonstration of competencies through performance tasks, projects, practical activities, and authentic assessments rather than reliance on traditional examinations alone. The significant influence of microteaching on product differentiation therefore suggests that teacher education programmes can support successful curriculum implementation by equipping pre-service teachers with skills necessary for designing varied and meaningful learner outputs.

Overall, the findings provide strong empirical evidence that microteaching is an effective strategy for developing product differentiation competencies among CRE pre-service teachers. The study therefore recommends that universities strengthen microteaching programmes by incorporating assessment design, authentic learning tasks, creativity-focused activities, and reflective feedback mechanisms to enhance pre-service teachers' capacity to accommodate learner diversity through differentiated products.

4.1.4 Influence of Microteaching on Differentiation of the Learning Environment

The fourth objective sought to determine the influence of microteaching on differentiation of the learning environment among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. Learning environment differentiation refers to the teacher's ability to create a classroom atmosphere that accommodates learner diversity through flexible classroom organization, positive social interactions, inclusive participation, adequate learning resources, and respect for individual learner differences. The study assessed participants' ability to form flexible groups, create supportive classroom environments, exploit learners' interests and ideas, provide diverse learning resources, respect learner contributions, and their overall competence in differentiating the learning environment.

Table 4

Paired Samples t-Test for Differentiation of the Learning Environment (n = 60)

Learning Environment Differentiation Indicator	Mean Difference	t	df	p-value
Forming fluid and flexible groupings	0.500	6.492	59	.000
Creating an atmosphere that supports diversity	0.250	1.932	59	.058
Exploiting learner interests and ideas	0.267	2.399	59	.020
Providing diverse learning materials and resources	0.233	1.843	59	.070
Respecting learner contributions	0.300	2.801	59	.007
Overall Learning Environment Differentiation	**0.620**	**7.743**	**59**	**.000**

The results presented in Table 4 indicate that participation in the microteaching programme significantly improved the overall ability of CRE pre-service teachers to differentiate the learning environment. Significant

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improvements were observed in forming fluid and flexible groupings ($t = 6.492$, $p < .001$), exploiting learners' interests and ideas ($t = 2.399$, $p = .020$), and respecting learner contributions ($t = 2.801$, $p = .007$). However, improvements in creating an atmosphere that supports diversity ($p = .058$) and providing diverse learning materials and resources ($p = .070$) were not statistically significant at the 5% significance level.

Despite the two non-significant indicators, the composite analysis revealed a statistically significant improvement in overall learning environment differentiation ($t(59) = 7.743$, $p < .001$; Cohen's $d = 1.000$), representing a large practical effect. Consequently, the null hypothesis (H_{04}), which stated that microteaching has no significant influence on differentiation of the learning environment among CRE pre-service teachers in public universities in Kenya, was rejected. The findings demonstrate that structured microteaching significantly enhances pre-service teachers' competence in creating learning environments that support inclusive classroom instruction.

The improvement observed in flexible grouping, learner participation, and respect for learner contributions suggests that microteaching provides authentic opportunities for pre-service teachers to practise classroom organization and interaction skills. During the microteaching cycle, participants were required to organize peers into learning groups, facilitate collaborative discussions, respond to learners' questions, and reflect on classroom interactions. The structured feedback received from supervisors and peers enabled participants to recognize strengths and weaknesses in classroom organization, leading to significant improvements during subsequent teaching sessions.

The absence of statistically significant improvement in creating supportive classroom environments and providing diverse learning materials may be attributed to contextual limitations rather than deficiencies in the microteaching model itself. Public universities in Kenya often conduct microteaching sessions under constrained conditions characterized by limited instructional resources, restricted teaching spaces, and large student cohorts. Such conditions may reduce opportunities for pre-service teachers to experiment with diverse classroom layouts, technological resources, and inclusive learning materials. Consequently, while participants improved their interpersonal classroom management skills, institutional resource limitations constrained the development of some aspects of environmental differentiation.

These findings are supported by Florian and Black-Hawkins (2011), who argue that inclusive classroom environments depend not only on teachers' pedagogical competence but also on institutional support, adequate resources, and collaborative learning cultures. Similarly, Ainscow (2020) observes that inclusive education succeeds when teachers create learning environments where every learner feels valued, respected, and actively involved in classroom activities regardless of individual differences. The significant improvement in respecting learner contributions found in this study reflects this principle of inclusive participation.

The findings also agree with Hammond (2015), who emphasizes that culturally responsive classrooms encourage learner engagement by creating emotionally safe and supportive environments that recognize learners' diverse experiences. Likewise, Gunes, (2020) note that effective classroom management extends beyond discipline to include establishing positive relationships, organizing flexible learning spaces, and promoting collaborative learning. The observed improvement in flexible grouping and learner participation demonstrates that microteaching contributes to these broader classroom management competencies.

From the perspective of Vygotsky's Sociocultural Theory, classroom learning is fundamentally a social process that occurs through interaction within supportive learning communities. During the microteaching programme, peer collaboration, observation, feedback, and reflective discussions created a social learning environment that enabled participants to improve their classroom organization skills through guided practice. These collaborative experiences provided the scaffolding necessary for participants to develop competencies required to establish inclusive classroom environments in future teaching practice.

The findings have important implications for Christian Religious Education teacher preparation in Kenya. CRE classrooms require environments that encourage open dialogue, mutual respect, moral reflection, and collaborative learning. By strengthening pre-service teachers' ability to organize flexible learning groups and value learner contributions, microteaching prepares future teachers to facilitate inclusive discussions on ethical, moral, and religious issues while accommodating learners from diverse cultural, social, and educational backgrounds.

Overall, the findings demonstrate that microteaching is an effective strategy for developing learning environment differentiation competencies among CRE pre-service teachers. However, universities should complement microteaching with greater investment in instructional resources, flexible teaching spaces, digital learning technologies, and simulation laboratories to strengthen aspects of environmental differentiation that require adequate physical and instructional infrastructure. Such improvements would further enhance teacher preparedness for implementing inclusive education in Kenyan secondary schools.

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V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

The study concludes that microteaching is an effective pedagogical strategy for developing differentiated instruction skills among Christian Religious Education (CRE) pre-service teachers in public universities in Kenya. The findings demonstrated that participation in structured microteaching sessions significantly improved pre-service teachers' competencies in differentiating instructional content, instructional processes, learner products, and the learning environment. Consequently, all four null hypotheses were rejected, confirming that microteaching positively influences the development of differentiation skills required for inclusive classroom practice. The iterative process of lesson planning, teaching, observation, feedback, reflection, and re-teaching enabled participants to translate theoretical knowledge into practical instructional competence. Guided by Vygotsky's Sociocultural Theory, the study established that collaborative learning, scaffolding, and reflective practice during microteaching contribute significantly to professional growth among pre-service teachers. Therefore, strengthening microteaching programmes within university teacher education curricula has the potential to enhance teacher preparedness for implementing learner-centred and inclusive education, particularly within the Competency-Based Curriculum in Kenya.

5.2 Recommendations

Based on the findings, the study recommends that public universities in Kenya strengthen and institutionalize microteaching as a core component of teacher education programmes by providing adequate time, instructional resources, structured supervision, and continuous formative feedback to support the development of differentiated instruction competencies. Teacher educators should deliberately integrate practical training on content, process, product, and learning environment differentiation into microteaching sessions while exposing pre-service teachers to authentic inclusive classroom scenarios. Universities should also invest in modern teaching technologies, simulation laboratories, and diverse instructional materials that enable student teachers to practice differentiated instruction under realistic conditions. Additionally, the Teachers Service Commission (TSC), the Commission for University Education (CUE), and curriculum developers should collaborate to establish national standards for assessing differentiation competencies during teacher preparation, thereby ensuring that graduates possess the practical pedagogical skills necessary to effectively address learner diversity in Kenyan schools.

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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