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Integrating Multiple Teaching Strategies in Language Learning for Teacher Training in the Digital Era

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ABSTRACT

In the digital era, integrating multiple teaching strategies into language instruction is increasingly vital in teacher education. This study investigates the adoption and effectiveness of multiple teaching strategies in enhancing the pedagogical competencies of pre-service language teachers in Kenyan universities. Anchored in Multimedia Learning Theory, the research explores how textual, visual, auditory, and interactive digital resources contribute to more engaging and effective language learning experiences. A descriptive research design incorporating both qualitative and quantitative methods was employed. Data was gathered through semi-structured interviews and questionnaires from a purposive sample of 30 informants, comprising five language lecturers and twenty-five pre-service teachers, from two public and three private universities in Kiambu County, Kenya. The study aimed to capture diverse perspectives on the impact of multiple teaching strategies in language teacher training programs. Interviews with lecturers provided insights into the practical benefits and challenges of using these strategies, while the questionnaires revealed how pre-service teachers perceived their influence on instructional delivery, comprehension, and classroom engagement. Findings indicate that incorporating varied media formats can enhance learners' understanding and participation, however lecture-based method is frequently used due to barriers such as limited digital literacy and inadequate technological infrastructure. The study recommends enhanced digital training for educators, improved access to educational technology, and curriculum reforms that support the integration of diverse instructional strategies. These findings contribute to ongoing conversations about innovative approaches in teacher education, emphasizing the importance of flexible and adaptive teaching methods suited to the evolving demands of 21st-century classrooms.

Keywords: Multiple Teaching Strategies; Language Learning; Teacher Training; Digital Era; Pedagogical Competency

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1. Introduction

Language learning remains a foundational component in teacher training programs globally, as it is critical for effective communication, instruction delivery, and curriculum implementation [1,2] discloses that over the years, education system in Kenya has progressively embraced diverse teaching strategies. The research [3] reinforces this by postulating that ministry of education is currently developing the context of technological advancements in classroom learning. This has made education system in the 21st century to witness a growing emphasis on digital literacy, learner autonomy, multimodality, and the integration of technology in pedagogical approaches [4]. In line with this, multiple teaching strategies should be engaged in learning languages. To some extent, multiple teaching strategies has emerged as pivotal tools for enhancing language acquisition and teaching effectiveness [5].

In Kenya teacher training education, especially at the university level, there has been development of a policy for the integration of these strategies which has suggested for education to be reinforced by digital infrastructure [6]. However, the research [7] noticed that teacher training institutions have been slower to adapt multiple teaching strategies. New education system is in the process of being implemented called Competency Based Education (CBE) in Kenya with a shift towards multiple teaching strategies [8]. While the Competency-Based Education (CBE) reform in Kenya signals a shift towards more dynamic and learner-centered pedagogies, the actual implementation at the teacher training level often remains a challenge [9]. Furthermore, the research [10] posit that limited access to digital tools, lack of policy clarity, and inadequate training on multiple and tech-integrated pedagogies hinder the full adoption of modern teaching strategies in Kenya.

The research [11] explain that existing research in Kenya has mostly focused on learning, curriculum changes, or ICT integration in general terms, without a specific focus on how multiple teaching strategies can be systematically integrated into learning within teacher training programs. There is a clear gap in understanding how Kenyan teacher training institutions can effectively adapt to the digital era by employing diverse, inclusive, and technologically supported teaching strategies in language instruction. This study seeks to fill this gap by exploring both the opportunities and challenges of integrating multiple teaching strategies in language learning for teacher trainees in Kenya, thereby contributing to the development of more responsive and future-ready teacher education models.

In this study, multiple teaching strategies in language learning refer to teaching and learning strategies that use multiple modes or channels of communication to enhance language acquisition [12]. These modes can include visual (e.g., images, videos, graphs), auditory (e.g., spoken language, music, sound effects), Gestural (e.g., body language, facial expressions), spatial (e.g., layout), and organization of information).

Universities play a central role in preparing future educators by incorporating innovative methodologies that align with evolving educational demands. The research [13] explain that the rapid advancement of digital technology has transformed various aspects of education. In contemporary classrooms, traditional instructional methods are increasingly being supplemented or replaced by multiple teaching strategies that integrate textual, visual, auditory, and interactive digital resources [14].

As explained by the research [15], these multiple learning strategies offer diverse learning experiences that cater to different learner needs, fostering engagement, comprehension, and instructional effectiveness. In the context of teacher training, the research [16] suggest that the adoption of multiple learning approaches is crucial in equipping pre-service teachers with the pedagogical competencies required for effective language instruction.

In Kenya, the integration of multiple learning strategies in teacher training programs remains an area of growing interest, particularly in institutions within Kiambu County. Grounded in the Multimedia Learning Theory, this study examines the effectiveness of multiple teaching strategies in language instruction among teacher trainees in selected public and private universities in Kiambu County, Kenya. By employing a descriptive research design with qualitative and quantitative approaches, the study explores how multiple teaching techniques contribute to instructional effectiveness and the challenges that educators face in their adoption.

1.1. Statement of the Problem

The increasing shift toward digital learning in education necessitates the integration of diverse instructional strategies to enhance language teaching. However, despite the recognized benefits of multiple teaching approaches in improving learner engagement, comprehension, and instructional effectiveness, little is known on their adoption in teacher training programs. In Kenyan universities, particularly in Kiambu County, there is a gap in more information about the effective implementation of multiple teaching strategies in pre-service teacher training for language instruction. Without proper training and institutional support, teacher trainees may struggle to effectively utilize multimodal strategies, ultimately affecting their pedagogical competencies and the quality of language instruction they provide.

This study, therefore, seeks to investigate the extent to which multiple teaching strategies are integrated into language instruction in teacher training programs in Kiambu County. It aims to assess their effectiveness in enhancing pre-service teachers' pedagogical skills and identify the barriers to their implementation. Addressing these gaps will contribute to the development of more effective teacher training methodologies, ensuring that educators are well-equipped to utilize multimodal techniques in contemporary language classrooms.

1.2. Objectives of the Study

1. To examine the extent to which multiple teaching methods of teaching are integrated into language instruction in teacher training programs.

2. To assess the effectiveness of multiple methods of teaching in enhancing the pedagogical competencies of pre-service language teachers.

3. To Explore the challenges faced by pre-service language teachers in adopting multiple methods in language instruction.

1.3. Research Questions

1. To what extent are multiple methods of teaching integrated into language instruction in teacher training programs?

2. How effective are multiple methods of teaching in enhancing the pedagogical competencies of pre-service language teachers?

3. What challenges do pre-service language teachers face in adopting multiple methods in language instruction?

1.4. Literature Review

The research [17] presents a compelling case for the integration of technology in the teaching of African languages within South African universities, advocating for a structured digitalization agenda to enhance pedagogy. The study underscores the urgent need for reform in language instruction to keep pace with the evolving digital landscape. It provides an insightful examination of the disconnect between policy frameworks that encourage ICT adoption and the on-ground realities of implementation within language departments. The study advocates the call for digitalization on transforming pedagogical practices to align with 21st-century learning expectations. However, the study only focuses primarily on technology as a tool, rather than situating it within a broader pedagogical framework involving multiple methods of teaching. The analysis centers around ICT-enhanced instruction and provides limited discussion on how diverse pedagogical approaches are currently integrated alongside technology in language teaching contexts. In this sense, the work tends to equate digitalization with effective teaching, overlooking the multifaceted nature of language pedagogy beyond technology which the current study examines.

The research [18] examine the implementation of interactive learning approaches and technology integration across various levels of the Kenyan education system. Their study underscores the transition from teacher-centred methods to more learner-centred, interactive approaches, particularly through digital platforms such as Learning Management Systems (LMS), educational mobile applications, and smart classroom technologies. They argue that such tools and methods have the potential to improve learner engagement, content retention, and critical thinking. A major strength of the study lies in its contextual relevance: it situates the Kenyan education system within the global shift toward interactive and technology-enhanced learning. However, the authors do not systematically assess the effectiveness of these strategies in developing specific

pedagogical competencies among pre-service teachers.

The research [19] explores how secondary school teachers adapted their instructional techniques to implement the Integrated English Curriculum (IEC) in Wareng Sub-County, Kenya. The study provides critical insights into classroom practices and the strategies teachers employ to navigate curriculum demands, resource constraints, and diverse learner needs. The findings highlight several adaptation techniques, including lesson improvisation, integration of literature and language content, contextualization of learning materials, and limited use of learner-centred approaches. The study also reveals that, although the curriculum advocates for integrated and interactive approaches, many teachers lack the pedagogical flexibility or institutional support to implement such methods meaningfully. This reflects a broader systemic issue in teacher education and professional development programs, which may not sufficiently prepare educators for curriculum innovation or methodological diversity. While this study focuses on in-service secondary school teachers, it has direct implications for pre-service teacher preparation, particularly in relation to the adoption of multiple teaching methods. The challenges experienced by trained teachers may be rooted in gaps during initial training, such as insufficient exposure to diverse pedagogical approaches, limited practicum support, and lack of modelling by trainers. However, the study does not investigate the experiences of pre-service teachers who may face unique challenges which the current study explores.

The research [20] examine the integration of visual, auditory, and textual elements in digital media with a focus on quality education. The study explores the integration of various modalities in English as a Second Language (ESL) instruction. The research emphasizes the significance of combining visual, auditory, and textual elements to enhance language learning, aligning with the objectives of the current study. While the study provides valuable insights into multiple teaching communication in ESL learning, it does not specifically address the extent to which these strategies are integrated into teacher training programs. This presents a knowledge gap, particularly concerning the practical application and training of multiple teaching strategies within local teacher education programs the current study addresses.

The study by the research [21] investigates pre-service teachers' (PSTs) beliefs regarding multiple teaching instructions and assessment for English learners (ELs). The findings show that while PSTs generally held favorable views toward multimodal instruction, their beliefs about multimodal assessment were more varied. Notably, PSTs often perceived nonlinguistic modalities primarily as compensatory tools to support English language development, rather than as integral components of disciplinary meaning-making. While Grapin explores pre-service teachers' beliefs about multiple teaching instructions and assessment, the study does not empirically assess how multiple teaching approaches actually impact the development of pedagogical competencies in pre-service language teachers. Specifically, there is limited understanding of the effectiveness of multiple teaching strategies in enhancing PSTs' practical teaching skills, instructional design, and reflective practices. Moreover, the perception of multiple teaching strategies as merely compensatory rather than integral to meaning-making suggests a conceptual gap in teacher training programs that needs to be addressed through applied pedagogical interventions which the current study explores.

Despite the advantages of multiple teaching approaches, several barriers hinder their effective adoption in teacher training programs. The research [22] examine enhancing teacher performance in e-learning. The study focuses on addressing barriers and promoting sustainable education in public universities of Pakistan. The findings point to limited digital literacy among educators as a primary challenge. In the Kenyan context, while universities recognize the value of digital learning, there might be possible factors that hinder seamless multiple teaching integration which the current study examines. Multiple teaching strategies leverage various modes of communication to enhance language acquisition. According to the research [23], multiple teaching instructions facilitates deeper comprehension by engaging learners through multiple sensory channels.

1.5. Research Gaps and Justification for the Study

While extensive research exists on multiple teaching strategies, limited studies focus specifically on its applica-

tion in teacher training programs in Kenyan universities. Most studies have been conducted in Western contexts, with little emphasis on how these strategies can be adapted to local educational settings in Kenya. Furthermore, there is a need to examine the specific challenges that Kenyan universities face in implementing multiple teaching strategies in language instruction. This study seeks to address this gap by exploring the integration, effectiveness, and challenges of multiple teaching approaches in teacher training programs in Universities within Kiambu County.

1.6. Theoretical Framework

This study is grounded in Cognitive Theory of Multimedia Learning (CTML) by the research [24]. This theory envisages the idea that learners learn more effectively from words and pictures combined than from words alone. The theory integrates principles from cognitive science and multimedia design to explain how people process and retain information when presented in a multiple format. Three tenets of this theory are used for data analysis in this study. The first one is multimedia principle which is used to examine the extent to which multiple teaching strategies are integrated into language instruction in teacher training programs. The tenet posits that learners understand better from words and pictures than from words alone. This concept is used to assess whether language learning instructions in teacher training programs combine visual, textual, and auditory elements.

The second tenet is the Redundancy Principle, which will be employed to assess the effectiveness of multiple teaching approaches in enhancing the pedagogical competencies of pre-service language teachers. This principle, derived from Mayer's Cognitive Theory of Multimedia Learning, posits that individuals learn more effectively when information is presented through graphics and spoken narration rather than through a combination of graphics, narration, and on-screen text. The rationale behind this principle is that redundant input across multiple channels, especially when spoken and written text present the same content, can overload the learner's cognitive capacity, leading to diminished learning outcomes. The tenet is used to evaluate effectiveness based on optimized combinations of input modes.

The third tenet is contiguity principles to explore the challenges faced by teacher trainees and their institutions in adopting multiple strategies for language instruction. This tenet alludes to the technological or instructional challenges that prevent simultaneous or spatially-aligned presentation of corresponding words and visuals. People learn better when they know the names and characteristics of concepts. Mayer's theory supports the use of multimodal approaches in teaching such as combining text, images, audio, and video but emphasizes that their cognitive alignment with how learners process information is essential for effectiveness. Poorly designed content for multiple teaching strategies can lead to cognitive overload and hinder learning.

2. Materials and Methods

This study adopted a descriptive research design incorporating both qualitative and quantitative approaches as suggested by the research [25]. This mixed-methods approach allowed for an in-depth understanding of how multiple teaching strategies can enhance pre-service teachers' pedagogical competencies while identifying the challenges faced in their adoption. The research was conducted in Kiambu County, Kenya, focusing on universities that offer teacher training programs in language instruction. The study targeted both public and private universities to provide a comprehensive perspective on the integration of multiple teaching approaches across different institutional settings. The study population included fourth year pre-service language teachers enrolled in teacher training programs and lecturers from the language departments of selected universities.

A purposive sampling technique was used according to the research [26] to select 5 universities and 25 participants based on their relevance to the study. The sample size of 30 informants consisted language lecturers (5 lecturers) and pre-service teachers (25 preservice teachers) from two public universities and three private universities offering language teacher training programs, one language department lecturer per institution, and five pre-service teachers were selected from each university to ensure diverse representation. Semi-structured interviews were conducted with language department lecturers to gather qualitative insights on the effectiveness and challenges of multiple teaching strategies in teacher training. Questionnaires were admin-

istered to pre-service teachers to collect quantitative data on their experiences with multiple teaching strategies and impact on their pedagogical skills.

Construct validity test was used to check if the questions were aligned with theoretical constructs under investigation. Reliability of the research instruments were tested using internal Consistency (Cronbach's Alpha) where Likert-scale items was calculated to assess the internal consistency of each subscale. A threshold of 0.70 or higher was considered acceptable. The interview guide and questionnaires were piloted with a small sample of 10 participants similar to the target group in Kiambu County to identify ambiguities and improve clarity. Feedback was used to revise and refine questions and the guide's wording and sequencing.

Qualitative data was analyzed using thematic analysis, identifying key themes related to multiple teaching strategies, integration, challenges, and instructional effectiveness. Audio recordings from interviews and discussions were transcribed verbatim. The researcher repeatedly read through the transcripts to gain a deep understanding of the content. Each segment of data was examined for meaningful patterns relevant to the research objectives, particularly focusing on themes of *multiple teaching strategies*, *instructional challenges*, and *pedagogical effectiveness*. Related codes were grouped into broader categories or candidate themes that captured recurring patterns and concepts, such as institutional limitations, curriculum design, technological competence, and pre-service teacher agency. Quantitative data from questionnaires was analyzed using descriptive statistics in percentages to measure the extent of multiple teaching strategy adoption and its impact on pre-service teachers' competencies. Responses were first screened for completeness and consistency. Categorical and Likert-scale data were coded numerically for analysis. Frequency and percentage distributions were calculated to determine the prevalence of various multimodal strategies used in instruction. Bar charts, pie charts, and frequency tables were used to visualize trends and facilitate interpretation of the extent of multiple teaching strategies integration across different teacher training institutions. Participants were briefed on the study's purpose, and their voluntary participation was ensured. Personal data was anonymized to maintain privacy. Permission was sought from relevant university authorities before conducting data collection. This methodological approach ensures a comprehensive assessment of how multiple teaching strategies can influence teacher training in language instruction within Kenyan universities.

3. Results

The study intended to find out how multiple teaching strategies are employed in teacher training, with a specific focus on understanding the extent to which multiple teaching strategies employing modes such as textual, visual, auditory, interactive, and digital tools are integrated into instructional practices.

3.1. Integration of Multiple Teaching Strategies in Teacher Training

Data were collected from fourth-year pre-service language teachers enrolled in teacher training programs. The dataset represents insights gathered from individuals in their final year of teacher training programs, specifically those specializing in language education. As fourth-year pre-service teachers, these participants have undergone substantial pedagogical coursework and practicum experiences, making them well-positioned to provide informed perspectives on the instructional strategies employed during their training.

The purpose of collecting data from this group was to assess their exposure to and experience with multiple teaching strategies, an increasingly essential component of effective language instruction. These strategies encompass various modes of communication, such as textual, auditory, visual, and digital/interactive tools, which cater to different learning styles and promote deeper engagement in language learning environments.

By focusing on fourth-year students, the study captures feedback from individuals at the culmination of their training journey. Their responses offer a reliable indicator of the instructional approaches emphasized throughout their training and the extent to which modern, multiple teaching strategies have been integrated into the teacher preparation curriculum.

3.1.1. Multiple Teaching Strategies in Language Teacher Training

Table 1 provides data indicating how often different teaching strategies are used, highlighting a need to increase the use of interactive and digital strategies.

3.1.2. Quantitative Data Presented in a Bar Chart

The data in **Figure 1**. provide valuable insights not only into current practices but also into potential gaps and areas for improvement in the design and delivery of teacher education programs, particularly in the context of preparing future language teachers for diverse and digitally enriched classrooms.

3.1.3. Qualitative Data: Direct Quotes from Pre-Service Teachers

Table 2 features direct quotes from participants that highlight how various teaching strategies were applied during language teacher training sessions. These personal insights provide a clearer picture of how preservice teachers experienced the integration of multiple instructional methods within their training.

Table 1. Statistical Analysis of quantitative Data on Multiple Teaching Strategies in Language Teacher Training (Kiambu County).

Teaching Strategy	Percentage of Participants Using	Assumed Mean Score (1–5 Likert)	Standard Deviation (SD)	Interpretation
Lecture-based Instruction	84%	4.4	0.60	Very frequently used
Textual & Visual Materials	72%	4.0	0.75	Frequently used
Auditory Resources	65%	3.7	0.80	Moderately used
Video/Online Activities	43%	3.1	0.85	Occasionally used
Interactive Digital Tools	38%	2.9	0.90	Least frequently used

Notes: Mean scores are inferred estimates based on the percentage of 30 participants reporting usage and mapped against the 5-point Likert scale; Standard Deviation (SD) values reflect possible variation in participant responses; sample size: 25.

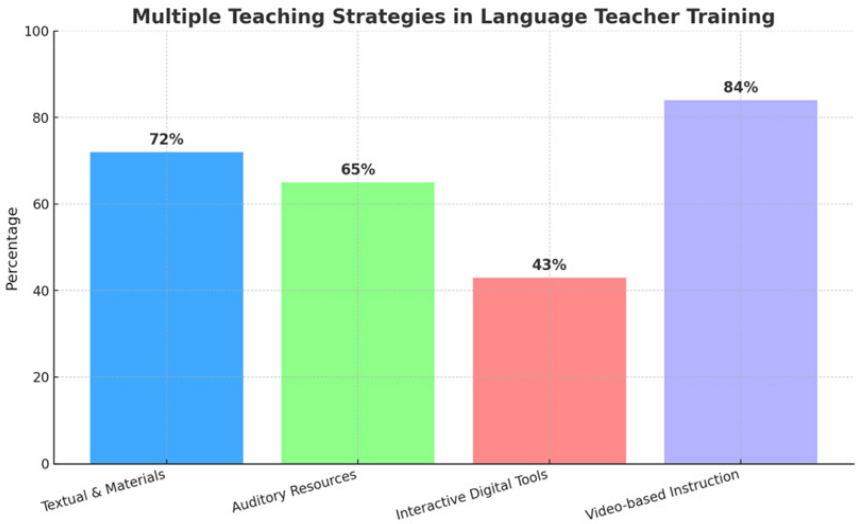


Figure 1. Multiple Teaching Strategies Employed in language Teacher Training at Universities in Kiambu County, Kenya.

Table 2. Direct quotes from pre-service teachers on teaching strategies.

Teaching Strategy	Direct Participant Quotes
Lecture-based Instruction (84%, M = 4.4)	*"Most of our lessons are lecture-based. It's what we're used to, and it helps when the teacher explains thoroughly."*—Pre-service Teacher, University A *"I learn best when I listen to the teacher first. Lectures give a foundation before we try other methods."*—Pre-service Teacher, University B

Table 2. *Cont.*

Teaching Strategy	Direct Participant Quotes
Textual & Visual Materials (72%, M = 4.0)	*" We do use textbooks with pictures or diagrams. It makes the lesson easier to follow, especially when learning new vocabulary."*—Pre-service Teacher, University C *"I like when the lecturer uses handouts and draws on the board; it helps me connect words to meanings."*—Pre-service Teacher, University D
Auditory Resources (65%, M = 3.7)	*"Sometimes we listen to audio clips or read aloud in class. It helps with pronunciation and listening skills."*—Pre-service Teacher, University E *"Audio materials are good, but we don't use them enough. When we do, I feel more confident in speaking."*—Pre-service Teacher, University A
Video/Online Activities (43%, M = 3.1)	*"Watching videos is helpful, especially for language use in real-life situations, but we rarely get to do that."*—Pre-service Teacher, University B *"When we use YouTube or online videos in class, I understand the cultural context better, but it happens once in a while."*—Pre-service Teacher, University C
Interactive Digital Tools (38%, M = 2.9)	*"We hardly ever use tools like Padlet or Google Docs in training. I wish we could do more digital activities."*—Pre-service Teacher, College I *"Digital tools are great for collaboration, but most trainers don't include them. Maybe they're not comfortable with technology."*—Pre-service Teacher, College J

3.2. Effectiveness of Multiple Teaching Strategies in Enhancing Pedagogical Competencies

In order to find out perceived effectiveness of various multiple teaching strategies in enhancing the pedagogical competencies of pre-service teachers. Quantitative data was analyzed from the responses of the informants interviewed (Preservice teachers). Here is a sample statistical analysis table for the effectiveness of multiple teaching strategies in enhancing pedagogical competencies, using quantitative data collected from pre-service teachers. The data provides a quantitative evaluation of various multimodal strategies based on mean scores, standard deviations, and respondent ratings regarding their perceived effectiveness.

3.2.1. Quantitative Data on Effectiveness of Multiple Teaching Strategies in Enhancing Pedagogical Competencies

Table 3 provides a breakdown of outcomes along with their corresponding effectiveness percentages, giving a clearer sense of how each instructional strategy was perceived in terms of its impact on teaching competence. The data not only quantifies effectiveness but also offers a comparative view of which approaches were most strongly associated with improved teaching performance among participants.

Table 3. Statistical Analysis of Survey Data on Effectiveness of Multiple Teaching Strategies.

Multiple teaching Strategy	Mean Score	Standard Deviation (SD)	Percentage of Respondents Rating as Effective (Agree/Strongly Agree)	Interpretation
Use of multiple tools (e.g., diagrams, videos)	4.32	0.61	88%	Highly effective
Explaining language concepts multimodally	3.95	0.74	82%	Moderately effective
Dual channel processing	4.10	0.68	79%	Effective
Interactive Platforms (e.g., Kahoot, Padlet)	3.88	0.82	85%	Moderately effective

Notes: Likert Scale: 1 = Strongly Disagree, 5 = Strongly Agree; Sample Size: 25; Interpretation Criteria: Mean ≥ 4.20 = Highly effective, Mean 3.80–4.19 = Effective, Mean 3.50–3.79 = Moderately effective, Mean < 3.50 = Less effective.

3.2.2. Quantitative Data in a Pie Chart

Figure 2 visually represents quantitative data reflecting the perceived effectiveness of four distinct teaching strategies, each designed to improve instructional quality. By displaying the effectiveness percentages, the chart offers a comparative overview of how each strategy contributed to enhancing teaching practices, based on participants' evaluations.

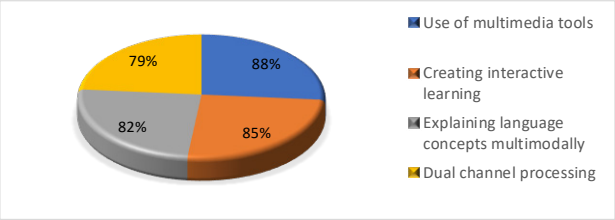


Figure 2. Perceived effectiveness of multiple teaching strategies among the pre-service teachers.

3.2.3. Qualitative Data: Perceived Effectiveness of Multiple Teaching Strategies

Table 4 presents direct quotes from pre-service teachers, offering personal reflections on the effectiveness of the different learning strategies they experienced during their training. These firsthand accounts provide valuable insight into how each strategy was perceived in terms of its impact on their learning and teaching development.

3.3. Challenges in Adopting Multiple Teaching Strategies

According to the responses from the informants, who were lecturers from the Department of Languages, a significant number of educational institutions are hindered by a lack of essential digital infrastructure. These institutions often do not have access to basic yet crucial teaching tools such as multimedia-equipped classrooms, projectors, interactive whiteboards, and reliable audio-visual systems. The absence of these tools greatly limits the ability of lecturers to implement multiple teaching strategies effectively, especially those that rely heavily on visual and interactive content. Moreover, the situation is further exacerbated by poor or inconsistent internet connectivity, which not only affects real-time access to digital learning platforms but also restricts the ability to stream videos, access cloud-based teaching materials, and utilize virtual learning environments. As a result, both teaching and learning processes become constrained, making it difficult to fully integrate modern educational technologies into the curriculum. This infrastructural gap poses a significant challenge to the advancement of technology-enhanced learning and undermines efforts to create engaging, inclusive, and interactive classroom experiences.

Table 4. Direct Quotes from Pre-Service Teachers on Perceived Effectiveness of Multiple Learning Strategies.

Multiple Teaching Strategy	Direct Participant Quotes
Use of multiple tools (e.g., diagrams, videos) *(Mean = 4.32, SD = 0.61, 88% Effective – Highly effective)*	*"When our lecturer used both diagrams and videos, I could easily visualize the content and it made learning easier."*—Pre-service Teacher, University A *"I understand better when different tools are used together—like videos for examples and diagrams for structure."*—Pre-service Teacher, University B
Explaining language concepts multimodally *(Mean = 3.95, SD = 0.74, 82% Effective – Moderately effective)*	*"Grammar rules are difficult, but when explained with gestures, drawings, and stories, it becomes clearer."*—Pre-service Teacher, University C *"Multimodal explanation makes abstract concepts like tenses easier to grasp, especially when you're a visual learner."*—Pre-service Teacher, University D
Dual channel processing *(Mean = 4.10, SD = 0.68, 79% Effective – Effective)*	*"Listening while watching a visual explanation helps me concentrate and retain more information."*—Pre-service Teacher, University E *"When the teacher talks and shows examples at the same time, I find it easier to follow and stay engaged."*—Pre-service Teacher, University C
Interactive Platforms (e.g., Kahoot, Padlet) *(Mean = 3.88, SD = 0.82, 85% Effective – Moderately effective)*	*"Using Kahoot makes learning fun and competitive. It helps me remember what we covered in class."*—Pre-service Teacher, University D *"I felt more involved when we used digital platforms like Padlet to contribute answers anonymously."*—Pre-service Teacher, University E

3.4. Qualitative Data on Challenges in Adopting Multiple Teaching Strategies

Table 5 presents direct quotes from lecturers discussing the challenges they encountered while trying to implement multiple teaching strategies. These reflections reveal the practical difficulties educators face in balancing diverse instructional methods within real classroom settings.

Table 5. Direct Quotes from Lectures on Challenges in Adopting Multiple Teaching Strategies.

Theme	Direct Quote from Lecturers
Inadequate infrastructure	*"We don't have access to basic teaching tools like projectors and interactive whiteboards."Lecturer, University A*
Reliance on outdated methods	*"Sometimes we rely on chalk and talk methods because there's no alternative." Lecturer, Universit B*
Lack of multimedia support	*"Multimedia-equipped classrooms are rare in our institution."Lecturer, University, C*
Internet connectivity issues	*"Internet connectivity here is very inconsistent. Sometimes we can't even download a video." Lecturer, University D*
Limited access to digital materials	*"Accessing cloud-based materials is a challenge when the network keeps dropping." Lecturer, University E*
Restricted innovation in teaching	*"We want to be innovative in our teaching, but the lack of tools and internet limits us." Lecturer, University A*
Difficulty in lesson engagement	*"It becomes hard to make lessons interactive or visually engaging." Lecturer, University, B*
Institutional neglect	*"There is little investment in upgrading teaching infrastructure." Lecturer, University C*

4. Discussion

4.1. Integration of Multiple Teaching Strategies in Teacher Training

The data in **Table 1** illustrates the extent to which different teaching strategies are employed by participants, based on the percentage of users, the assumed mean score on a 5-point Likert scale, and the standard deviation (SD). This is reinforced with data in in **Figure 1** of the bar chat which indicate that universities in Kiambu County have partially integrated multiple teaching strategies into their language teacher training programs. Approximately 72% of pre-service teachers reported regular exposure to textual and visual materials, such as printed notes, slides, and infographics. This strategy has a mean score of 4.0, meaning it is frequently used. With an SD of 0.75, there is slightly more variation in usage compared to lecture-based instruction. The high usage could stem from its effectiveness in supporting diverse learning styles and enhancing comprehension through multimodal representation. While 65% confirmed the use of auditory resources including audio recordings and video lectures, the mean score of 3.7 indicates moderate use, and the SD of 0.80 suggests variability in user preferences. As much as it is beneficial for auditory learners, it might be less favoured due to the need for supplementary materials to ensure full engagement. However, only 38% indicated access to interactive digital tools like educational apps, online simulations, or digital storytelling platforms with a low mean score of 2.9. The highest SD (0.90) among all strategies implies significant disparity in adoption. Despite their potential to promote learner engagement and interactivity, tools like quizzes, apps, or simulations may be underused due to digital literacy gaps or lack of infrastructure. Only 43% of participants reported using this strategy, with a mean of 3.1 signifying occasional use. The SD of 0.85 indicates a wider spread in participant responses, possibly due to differences in digital access, confidence, or institutional support. Although videos can enhance interactivity and illustrate complex ideas, limited usage suggests underutilization of digital pedagogy in training programs. Lecture-based instruction remained the predominant method in 84% of the interviewed informants at a high mean score of 4.4, indicating it is very frequently used. The low standard deviation (0.60) suggests a high level of agreement among participants on its usage. This may reflect a traditional preference in teacher training programs for lecture-centric instruction, which is often valued for its efficiency in content delivery.

These findings align with [20], who underscore the effectiveness of integrating visual, auditory, and textual elements in enhancing language learning. Nevertheless, the relatively low adoption of interactive resources points to a critical gap in fully leveraging multiple teaching strategies to improve pre-service teachers' instructional competencies and adaptability to diverse learning environments. This confirms the multimedia principle of Cognitive Theory of

Multimedia Leaning Theory by the research [9], which posits that learners understand better from words and pictures than from words alone.

The study findings indicate that some universities in Kiambu County have partially integrated multiple teaching strategies into their language teacher training programs. Most pre-service teachers reported exposure to textual, visual, and auditory learning resources, but interactive digital tools were less frequently utilized. While some institutions incorporated videos, online simulations, and digital storytelling, traditional lecture-based instruction remained dominant. These findings align with the researcher [15] who claims that in contemporary classrooms, traditional instructional methods are increasingly being supplemented or replaced by multiple teaching approaches that integrate textual, visual, auditory, and interactive digital resources. However, the limited use of interactive resources suggests a gap in fully harnessing the potential of multiple teaching approaches to enhance pre-service teachers' instructional competencies.

Informants (Lecturers from the Department of Languages) were asked to reflect on the extent to which they employ multiple teaching strategies in teacher training within language education. Many respondents acknowledged that while multiple teaching strategies can be effective, developing coherent and pedagogically sound content is both time-consuming and demanding. As a result, they tend to use these strategies less frequently. Some responses indicated that, without careful planning and thoughtful integration, multiple teaching strategies risk overwhelming trainees rather than enhancing their learning. These observations are consistent with the findings of the research [22], who identify limited digital literacy among educators as a significant barrier to the effective adoption of multiple teaching strategies in teacher training programs.

4.2. Effectiveness of Multiple Teaching Strategies in Enhancing Pedagogical Competencies

From data in **Figure 2**, some responses from the informants interviewed indicate that some pre-service teachers who engaged with a variety of multimodal resources such as a combination of visual, auditory, and textual elements reported improved teaching skills, particularly in structuring lessons. This increases ability to create interactive and engaging learning experiences, which improves the ability to explain language concepts. The application of redundancy principle of Multimedia Learning Theory by the research [24] was evident, as pre-service teachers benefited from dual-channel processing, where both verbal and visual elements reinforced understanding. This indicates that the modality principle (using audio instead of only text) and the multimedia principle (combining text and visuals) significantly enhances lesson delivery. This finding is in agreement with the findings of the study by the research [24], showing that pre-service teachers perceive nonlinguistic modalities primarily as compensatory tools to support English language development, rather than as integral components of disciplinary meaning-making.

Figure 2 highlights the fact that pre-service teachers overwhelmingly value the use of multimedia in lessons, with 88% rating it as the most important skill. This high endorsement suggests they see multimedia not just as an add-on but as a core tool for organizing and delivering rich, engaging content. **Table 2** backs this up with a strong mean score of 4.32 and a low standard deviation of 0.61, pointing to consistent agreement across the board. It seems that blending different media appeals to varied learning styles, making it easier for students to grasp and remember material.

On a similar note, 85% of respondents acknowledged the importance of creating interactive learning environments. However, the numbers tell a slightly more complex story. Despite the high percentage, the mean score here drops to 3.88, and the standard deviation rises to 0.82, the highest among all the metrics. This suggests some mixed feelings. Teachers might differ in how effective they think interactivity really is, perhaps due to varying levels of comfort with tech, differences in classroom infrastructure, or challenges in keeping students engaged.

Explaining language concepts using multiple modes, like combining text, images, and sound, also scored well, with 82% of respondents in favor. Still, the standard deviation of 0.74 reveals that experiences with this method vary. Its success likely depends on factors such as the teacher's training, the type of content, and the availability of media tools. Even so, the general takeaway is clear: using multiple sensory channels tends to boost student understanding

and involvement.

Interestingly, the concept of dual-channel processing, which lies at the heart of Mayer's Cognitive Theory of Multimedia Learning, didn't rate as high as one might expect. Only 79% highlighted it, despite a decent mean score of 4.10 and a moderate standard deviation of 0.68. This method, presenting information both visually and verbally, is well-supported by research, yet its effects may not be as immediately noticeable in practice. While the theory holds water, its classroom application might feel abstract or less obvious to educators working on the ground.

The data indicates that pre-service teachers prefer practical, visible strategies like using digital media and promoting interactivity over abstract theoretical concepts. This points to a disconnect between theory and practice, emphasizing the need for more targeted training to bridge this gap. This finding aligns with the research [20], who highlight the importance of integrating visual, auditory, and textual elements to support language learning. As such, teacher education programs should embed cognitive principles into hands-on activities to help trainees apply them effectively in real classroom settings.

Some lecturers from the Department of Languages acknowledged that when teacher trainees use videos, audio recordings, and visual aids in their micro-teaching sessions, they tend to explain concepts more clearly and creatively. This suggests that such tools not only enhance learner engagement but also encourage deeper reflection on teaching practices. However, there is a need to ensure that the use of multiple teaching strategies is properly aligned with language learning objectives in teacher training programs. This alignment will guide pre-service teachers in the effective and purposeful application of multimedia approaches. These findings support the researcher [14] who argue that multiple teaching strategies offer varied learning experiences that meet diverse learner needs, thereby enhancing engagement, comprehension, and overall instructional effectiveness.

4.3. Challenges in Adopting Multiple Teaching Strategies

One of the most significant obstacles to integrating multiple teaching strategies in teacher education is the limited technological infrastructure available in many universities and teacher training institutions, as reported by several language department lecturers interviewed shown in **Table 5**. Some informants noted that, in numerous cases, institutions lack essential modern digital tools, such as multimedia-equipped classrooms, projectors, interactive whiteboards, and reliable audio-visual systems. In addition, inconsistent or unreliable internet access often hinders the ability to stream educational content, utilize cloud-based teaching tools, or participate in virtual collaboration.

These infrastructural deficiencies not only obstruct the effective integration of multiple teaching strategies into teaching and learning processes but also exacerbate inequalities between institutions with advanced technological capabilities and those without. This finding supports the observations of the research [22], who emphasize the need to eliminate infrastructural and systemic barriers to achieve sustainable education in public universities in Pakistan. While their study highlights limited digital literacy among educators as a primary challenge, the present research identifies inadequate infrastructure as a more urgent and foundational concern within the context of teacher training.

Another major challenge lies in the design and structure of the teacher training curriculum. In many institutions, the curriculum is not adequately aligned with the pedagogical demands of multiple teaching instruction. Multiple teaching strategies are often positioned as supplementary or optional enhancements rather than being systematically embedded as core teaching practices. This approach limits opportunities for pre-service teachers to engage meaningfully with multiple teaching resources, such as podcasts, infographics, collaborative digital platforms, and interactive video tools. In the absence of a curriculum that explicitly prioritizes multiple teaching pedagogical frameworks and offers structured, hands-on experiences, the potential for innovative teaching remains largely unrealized. These findings resonate with the work of the research [16], who argue that the successful adoption of multiple teaching approaches is vital in preparing pre-service teachers with the pedagogical competencies required for effective and engaging language instruction.

Institutional and policy-level barriers further compound these challenges. Responses from interview participants indicate that many institutions lack clear policies

or strategic frameworks that support the use of multiple teaching approaches in teacher education. According to some informants, budgetary constraints often inhibit the acquisition of digital technologies and the implementation of professional development programs aimed at enhancing educators' digital pedagogical skills. Additionally, the absence of continuous training opportunities means that even motivated lecturers may face difficulties integrating multiple teaching strategies due to outdated competencies or unfamiliarity with emerging technologies. These findings are consistent with the research [19], who identify infrastructural limitations and digital skill gaps as major impediments to the adoption of technology-enhanced learning. Their research underscores the urgent need for systemic investment in both technological infrastructure and professional development. Without such targeted investment, efforts to embed multiple teaching strategies in teacher education programs are likely to remain disjointed, underutilized, and ultimately ineffective.

5. Conclusions

This This study emphasizes the powerful role of multiple teaching strategies in language teacher training, highlighting their ability to enhance engagement, comprehension, and instructional effectiveness through multimodal approaches. While these strategies offer valuable tools for pre-service teachers, their impact is often limited by inadequate infrastructure, outdated curricula, and rigid institutional policies.

To overcome these challenges, the study recommends implementing targeted digital literacy programs, improving access to digital infrastructure, and embedding multimodal instruction into teacher training curricula. Policy implications include investing in technology, reforming assessment methods, and promoting continuous professional development. In practice, educators should adopt blended learning models, use diverse digital tools, and adapt strategies to local contexts.

Future research should explore the effectiveness of specific multimodal techniques, the link between digital literacy and pedagogical integration, and the challenges faced in low-resource environments. Overall, a coordinated effort across policy, practice, and research is essential to fully realize the potential of multimodal teaching in preparing future language educators.

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Institutional Review Board Statement

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study. Participation was entirely voluntary, and confidentiality of the participants' responses was maintained throughout the research process.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical considerations.

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Conflicts of Interest

The author declares no conflict of interest in the production, presentation, or dissemination of the findings of this study.

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