

DIGITAL PEDAGOGIES AND TEACHERS' DIGITAL COMPETENCE IN EARLY CHILDHOOD CARE DEVELOPMENT AND EDUCATION IN THE FEDERAL CAPITAL TERRITORY, NIGERIA

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Abstract

This study examined Digital Pedagogies, Teachers' Competence, and the Effectiveness of Pre-Primary Education in Nigeria. Three research questions were formulated to guide the study. The descriptive survey research designs were adopted for the study. The population of the study comprised 45 pre-primary school teachers in selected early childhood education centres within Abuja Municipal Area Council (AMAC), Federal Capital Territory. A sample size of 30 teachers was selected for the study using a purposive sampling technique. A self-designed questionnaire titled: "Digital Pedagogies, Teachers' Competence, and Delivery Questionnaire" (DPTCDQ) was used for data collection which had a reliability index of 0.81. The three research questions were answered using mean scores and standard deviation, while the hypotheses were tested using linear regression at 0.05 level of significance. Based on the findings of the study, it is concluded that the use of digital devices and digital pedagogies in pre-primary schools in the FCT, Abuja is generally low. Teachers demonstrated limited competence in integrating digital technologies into numeracy instruction due to inadequate training and insufficient digital resources. However, the study established a significant positive relationship between teachers' digital competence and the effective use of digital pedagogies. Based on the findings of the study, the study recommended amongst others that: Government and school authorities should provide adequate digital devices such as computers, tablets, projectors, and internet facilities in pre-primary schools to improve the utilization of digital technologies for teaching and learning activities,

Keywords: FCT, digital pedagogies; teachers' competence; pre-primary education; instructional delivery; early childhood education

Introduction

Early childhood represents a critical period in human development during which children acquire foundational cognitive, language, socio-emotional, and motor skills necessary for lifelong learning and social functioning. These foundational learning experiences are connected to children's developmental domains, which represents the major areas of growth and developmental progression during early childhood. Scholars have emphasised that the early years are marked by both vulnerability and huge developmental potential, requiring adequate care, stimulation, and structured learning experiences to ensure optimal growth (Olowe, 2023). Consequently, pre-primary education plays a vital role in shaping children's intelligence, personality, and social behaviour, serving as a foundation for subsequent learning at the primary level (Ejeh, 2006).

In Nigeria, the importance of early childhood education has been formally recognised through policy frameworks such as the National Policy on Education and the Universal Basic Education (UBE) Act, which underscore the need to provide quality early learning experiences that facilitate smooth transition from home to school and promote basic literacy and numeracy skills (FRN, 2014). Despite these policy commitments, the

delivery of pre-primary education in the Federal Capital Territory and by extension Nigeria continues to face significant challenges, including inadequate infrastructure, insufficient funding, and a shortage of qualified and competent teachers (Mahuta, 2007; Sooter, 2013).

In recent years, there has been a growing global shift toward the integration of digital technologies in education, giving rise to digital pedagogies. Digital pedagogies involve the purposeful use of digital tools and technologies to enhance teaching and learning processes, promote interaction, and support child-centered and play-based learning approaches. In early childhood settings, appropriately designed digital learning experiences have the potential to foster creativity, critical thinking, collaboration, and engagement among young learners (UNESCO, 2021). Basically, the Early Childhood Care, Development and Education curriculum in Nigeria promotes holistic child development through integrated learning experiences that covers key areas such as literacy and language development, numeracy, environmental studies, social and moral development, creative arts, and physical and health education. These learning areas are designed to develop children's cognitive, social, emotional, and physical abilities through interactive and child-centred activities. Grace Adeoye (2017) noted that the ECCDE curriculum supports balanced foundational learning by integrating essential developmental experiences needed for children's overall growth and future learning.

Early childhood education also emphasises major developmental domains such as gross and fine motor skills, language development, cognitive growth, self-help abilities, and social-emotional competence, all of which are essential for children's school readiness and holistic development (Bredekamp & Copple, 2009). In the same vein, foundational literacy components such as phonemic awareness, phonics, vocabulary, reading fluency, and comprehension are regarded as critical building blocks for effective learning and lifelong academic success (Snow, Burns, & Griffin, 1998). In the Nigerian context, the use of digital pedagogies in pre-primary education remains uneven and, in many cases, underdeveloped. While some schools have access to digital devices, their utilisation is often limited or misaligned with play-based and child-centered learning principles. Issues such as inadequate teacher training, limited digital literacy, infrastructural constraints, and lack of pedagogical guidance continue to hinder effective implementation (Berhanu, 2024; Ngene, 2025). As a result, the potential of digital pedagogies to improve instructional effectiveness in pre-primary education has not been fully realised.

In re-envisioning Pre-Primary Education in the Federal Capital Territory through Digital Pedagogies, the persistent challenges confronting early childhood care and education (ECCE) in the FCT ranges from limited access and inequitable provision to poor teacher quality, inadequate infrastructure, and overemphasis on rote learning necessitate a fundamental rethinking of pre-primary education. While the National Policy on Education (2014) recognises pre-primary education as the foundation of the educational system, implementation gaps have continued to undermine its delivery hence the need for re-considering other methods such as digital tools to boost cognitive domains of the pupils.

In this perspective, digital pedagogies present a transformative opportunity to reposition pre-primary education as an inclusive, learner-centred, and developmentally appropriate system that responds to the realities of the twenty-first century. Digital pedagogy in early childhood education extends beyond the mere integration of technological devices into classrooms; rather, it embodies a shift towards interactive, participatory, and flexible learning approaches that leverage digital tools to enhance cognitive, social, and emotional development (Burnett, 2010; Fleeer, 2018).

Within the Nigerian setting, re-assessing foundational education through digital pedagogies requires a structure approach that aligns with infrastructural limitations, socio-cultural diversity, and varying levels of digital literacy. This implies moving away from screen-dominated instruction towards a blended, play-based digital learning model where technology complements, rather than replaces, teacher-child interaction. A critical dimension of this re- imagination is the adoption of equitable and accessible digital solutions. Given the disparities in electricity, internet connectivity, and device availability across the Federal Capital Territory, particularly in rural and underserved communities, digital pedagogy must be designed around offline-first and low-cost technologies.

Tools such as pre-loaded tablets, solar-powered devices, radio-based instruction, and mobile phone-supported learning platforms can bridge access gaps while ensuring scalability (UNICEF, 2020). Such approach aligns with the principle of educational equity by preventing digital transformation from becoming an exclusive privilege of urban and high-income populations. Furthermore, digital pedagogies offer a pathway to shift in pre-primary education from its current emphasis on early formal academics to true play-based and exploratory learning. Research in early childhood education consistently highlights play as central to children's development, fostering creativity, problem-solving, and social interaction (Wood, 2013).

Digital tools, such as interactive storytelling applications, phonics games, animated numeracy activities, and creative drawing platforms can enrich play experiences when used intentionally within a structured pedagogical framework. Importantly, these tools must be culturally responsive, incorporating Nigerian languages, such as the Gbagyi, Gwari and other languages including Yoruba , prominently spoken languages in North-central Nigeria as well as Hausa, Igbo languages to tell folktales, and familiar contexts to enhance relevance and engagement. The role of the teacher remains pivotal in this re-imagined framework. This underscores the need for targeted professional development programmes focused on Technological Pedagogical Content Knowledge (TPACK), enabling teachers to balance content delivery, pedagogy, and technology integration (Mishra & Koehler, 2006), opined that Teachers must be equipped to use digital resources as instructional stimuli facilitating storytelling, guided play, collaborative activities, and reflective dialogue rather than as passive content delivery mechanisms. Language and inclusivity also occupy a central place in digitally reimagined pre-primary education.

Teachers' competence is widely regarded as a fundamental determinant of educational quality and learner achievement, particularly in early childhood and pre-primary education. It refers to the combination of knowledge, skills, attitudes, and professional abilities that enable teachers to effectively plan, implement, and evaluate instructional activities. In the context of early childhood education, competence extends beyond subject mastery to include pedagogical knowledge, emotional intelligence, classroom management skills, and the ability to apply developmentally appropriate practices. According to Olowe (2023), teachers' competence in early childhood education involves the capacity to create stimulating, safe, and interactive learning environments that support children's holistic development. This includes fostering cognitive growth, language development, socio-emotional skills, and psychomotor abilities. Competent teachers are also expected to understand individual differences among learners and adjust instructional strategies accordingly to meet diverse learning needs.

Similarly, Ejieh (2006) emphasizes that the effectiveness of early childhood education is highly dependent on the quality of the teacher, as teachers serve as the primary facilitators of learning experiences during the formative years. In this regard, pedagogical competence becomes essential, as it enables teachers to select appropriate

teaching methods such as play-based learning, storytelling, group activities, and experiential learning strategies that align with children's developmental stages. In recent years, teachers' competence has expanded to include digital competence, which refers to the ability to effectively integrate digital tools and technologies into instructional processes. Hassan and Bala (2021) note that teachers who possess both pedagogical and digital competence are better positioned to deliver interactive and engaging lessons that enhance learner participation. Digital competence also involves the ability to select appropriate digital resources, manage technology-enhanced classrooms, and apply digital tools in ways that support learning objectives.

The delivery of pre-primary education refers to the extent to which early childhood education achieves its intended goals of promoting holistic child development and preparing learners for successful transition into primary education. It is often measured in terms of children's cognitive development, language acquisition, socio-emotional growth, school readiness, and overall learning outcomes. Pre-school education is widely recognised as the foundation of lifelong learning, as it provides children with their first structured learning experiences. According to Olowe, Kutelu, and Majebe (2014), early childhood education plays a crucial role in shaping intellectual development, social behaviour, and emotional stability. When effectively implemented, it helps children develop essential skills such as communication, problem-solving, creativity, and cooperation.

The National Policy on Education (FRN, 2014) also emphasises that pre-primary education should provide a smooth transition from home to school and prepare children for primary education by introducing basic literacy, numeracy, and social skills through play-based learning. This asserts that delivery of education in early childhood learning is not measured solely by academic performance but also by the overall development of the child. Sooter (2013) further explains that effective pre-primary education should foster proper development of children, identify and address learning difficulties early, and equip learners with the necessary skills for future educational success. This implies that effectiveness is closely linked to the quality of instructional practices, learning environment, and teacher competence.

However, empirical studies show that the delivery of pre-primary education in many developing countries, including Nigeria, is often constrained by systemic challenges such as inadequate funding, shortage of qualified teachers, poor infrastructure, and limited access to instructional resources (Mahuta, 2007). These challenges negatively affect the quality of teaching and reduce the ability of schools to achieve desired educational outcomes. Meanwhile, modern educational research suggests that the integration of innovative pedagogical approaches, such as digital pedagogies, can significantly improve the effectiveness of pre-primary education when properly implemented. Digital tools can enhance learner engagement, support individualised instruction, and promote interactive and play-based learning experiences. However, the delivery of such innovations depends largely on teachers' competence and the availability of supportive infrastructure. Therefore, the successful delivery of pre-primary education is a multidimensional construct that reflects the quality of teaching, learning environment, resource availability, and the ability of teachers to apply appropriate pedagogical approaches that meet the developmental needs of young learners.

This study is anchored on the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). The TPACK framework explains how teachers integrate technology into teaching by combining three interrelated knowledge domains: Content Knowledge (what is taught), Pedagogical Knowledge (how

it is taught), and Technological Knowledge (the use of digital tools and resources). The framework posits that effective instruction occurs when these three knowledge areas are thoughtfully integrated rather than treated in isolation. In the context of this study, TPACK is particularly relevant because it provides the chance for understanding how teachers in pre-primary education can truly deliver impactful teaching using digital tools to enhance education at the foundational level. It emphasises that the use of technology in the classroom is not sufficient on its own; rather, its effectiveness depends on how well it is blended with appropriate teaching methods and an understanding of learners' developmental needs. This is especially important in pre-primary education, where learning is expected to be play-based, interactive, and developmentally appropriate.

The TPACK framework is based on several key assumptions. First, it assumes that effective teaching is a complex process that requires the integration of content, pedagogy, and technology. Second, it assumes that technology alone does not improve learning outcomes unless it is properly aligned with pedagogical strategies and instructional content. Third, it assumes that teachers' competence plays a central role in determining how effectively technology is integrated into classroom instruction. Fourth, it recognises that the teaching context, including available resources and learner characteristics, influences the success of technology integration. Finally, it assumes that meaningful learning occurs when technology is used to support engagement, understanding, and active participation rather than being used as a substitute for instruction. The relevance of the TPACK framework to this study lies in its direct connection to the key variables under investigation, namely digital pedagogies, teachers' competence, and the delivery of pre-primary education. The framework provides a theoretical explanation for how teachers' competence influences the use of digital pedagogies in the classroom. It also helps to explain how the effective integration of technology, pedagogy, and content can enhance the quality of instruction and improve learning outcomes among pre-primary learners. Furthermore, the framework is appropriate for this study because it highlights the importance of teachers' ability to combine digital tools with suitable instructional methods to achieve meaningful learning experiences. Considering early childhood education in the Federal Capital Territory, where challenges such as inadequate training, limited access to digital resources, and infrastructural constraints exist, the TPACK framework helps to explain why variations in teachers' competence may lead to differences in the delivery of digital pedagogy implementation. It therefore provides a strong theoretical foundation for examining how digital pedagogies and teachers' competence jointly influence the effectiveness of pre-primary education in the FCT.

However, given the central role of teachers' in mediating the use of digital pedagogies, there is a need to empirically examine how these factors interact to result to impactful delivery of digital pedagogies at the pre-school primary education level in the Federal Capital Territory. Understanding the relationship between teachers' competence, and ECCDE delivery is essential for informing policy, improving teacher preparation, and enhancing classroom practices. It is against this backdrop that this study investigates digital pedagogies, teachers' competence, and the delivery of ECCD education in the federal capital territory, Nigeria.

Statement of the Problem

The integration of digital pedagogies and teachers' digital competence is increasingly recognised as essential for improving the quality of Early Childhood Care, Development and Education (ECCDE). Appropriate use of digital technologies can enhance play-based, child-centred learning, improve instructional delivery, and support children's cognitive, language, and social development (UNESCO, 2021; Bredekamp &

Copple, 2009). Consequently, the National Policy on Education expects pre-primary teachers to possess the competence and resources required to effectively integrate technology into teaching and learning (FRN, 2014). However, the situation in many pre-primary schools in the Federal Capital Territory does not reflect this expectation. The integration of digital pedagogies remains limited due to inadequate digital facilities, insufficient professional training, and low levels of teachers' digital competence (Mahuta, 2007; Sooter, 2013; Berhanu, 2024). As a result, many teachers continue to depend largely on conventional teaching methods, thereby limiting opportunities to improve instructional effectiveness through technology. Although previous studies have examined technology integration and early childhood education, there is limited empirical evidence on how teachers' digital competence influences the use of digital pedagogies and the delivery of ECCDE in the Federal Capital Territory, Nigeria.

Purpose of the Study

The main objective of this study is to examine the relationship between digital pedagogies, teachers' competence, and the delivery of Early Childhood Care, Development and Education (ECCDE) in the Federal Capital Territory, Nigeria, with a view to determining how teachers' digital competence and the integration of digital pedagogical practices influence instructional effectiveness and learning outcomes in pre-primary education.

Research Questions

The following research questions guided the study:

1. What type of digital devices are utilised in pre-primary classrooms?
2. What digital pedagogical practices are employed by pre-primary school teachers in teaching numeracy?
3. What is the level of teachers' digital competence in integrating digital pedagogies in pre-primary education subjects such as literacy?

Methods

This study adopted a descriptive survey research design. The choice of the descriptive survey design is informed by its suitability for collecting data from a defined population through the use of questionnaires. The population of the study comprised 45 pre-primary school teachers in selected early childhood education centres within Abuja Municipal Area Council (AMAC), Federal Capital Territory. A sample size of 30 teachers was selected for the study using a purposive sampling technique. This approach allowed the researcher to specifically target teachers who are actively engaged in pre-primary education and are likely to have some level of exposure to digital tools or teaching practices. The primary instrument for data collection was a structured questionnaire titled "Digital Pedagogies and Teachers' Competence Questionnaire (DPTCQ)" developed by the researcher which consisted of 15 items. The questionnaire was divided into sections to capture relevant variables, including demographic information, use of digital tools, types of digital devices utilised, challenges affecting digital integration, teachers' readiness, and attitudes toward play-based digital learning. The items were designed using four-point Likert scale format: VHL = Very High Level; HL = High Level; LL = Low Level; VLL = Very High Level and SA= Strongly Agree; A= Agree; D= Disagree; SD= Strongly Disagree

The reliability of the instrument was established through a pilot test conducted with a small group of pre-primary teachers outside the main study area. The responses were analysed using Cronbach Alpha Method which generated an internal consistency index of 0.81 indicating that the questionnaire is reliable. The data collected were analysed

using frequency counts, percentages, mean scores and standard deviation. Responses from the Likert scale items were weighted as follows: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). A decision mean of 2.50 was used as the benchmark for interpreting responses.

Data Analysis And Results

Research Question One: What type of digital devices are utilised in pre-primary classrooms in the FCT, Abuja?

Table 1: Types of digital devices are utilized in pre-primary classrooms

S/N	Types of digital devices are utilized in pre-primary classrooms	4	3	2	1	Mean	SD	Decision
1	Mobile phones are used to support teaching and learning activities in my classroom	11	9	7	3	2.93	1.01	Agreed
2	Tablets are available for instructional activities in my classroom	3	6	16	5	2.23	0.86	Disagreed
3	Computers are incorporated into classroom learning activities	2	9	13	6	2.23	0.86	Disagreed
4	Radio are used as teaching aids in my classroom	6	6	8	10	2.27	1.14	Disagreed
5	Televisions are used to facilitate learning in my classroom	2	4	11	13	1.83	0.91	Disagreed
6	Projectors are employed for instructional presentations and classroom activities	9	4	8	9	2.43	1.22	Disagreed
Sectional Mean/SD						2.32	1.00	Disagreed

Table 1 presents the types of digital devices utilized in pre-primary classrooms in the Federal Capital Territory (FCT), Abuja, with a sectional mean and standard deviation of 2.32 and 1.00 respectively. The analysis revealed that mobile phones are used to support teaching and learning activities in the classroom, recording a mean score of 2.93 and a standard deviation of 1.01, which is above the benchmark of 2.50. This indicates that mobile phones are utilized in pre-primary classrooms. Further analysis showed that projectors are employed for instructional presentations and classroom activities with a mean score of 2.43 and SD of 1.22, although this falls slightly below the benchmark and was therefore adjudged not utilized. Similarly, radios used as teaching aids recorded a mean score of 2.27 and SD of 1.14, while tablets available for instructional activities recorded a mean score of 2.23 and SD of 0.86. Computers incorporated into classroom learning activities also had a mean score of 2.23 and SD of 0.86. In addition, televisions used to facilitate learning recorded the lowest mean score of 1.83 and SD of 0.91. Conclusively, the sectional mean indicated that digital devices are generally not utilized in pre-primary classrooms in FCT, Abuja, except for mobile phones which were found to be adequately utilized for teaching and learning activities.

Research Question Two: What digital pedagogical practices are employed by pre-primary school teachers in teaching numeracy in FCT, Abuja?

Table 2: Digital pedagogical practices employed by teachers in pre-primary education

S/N	Digital pedagogical practices employed by teachers in pre-primary education	4	3	2	1	Mean	SD	Decision
Teachers:								
6	use digital storytelling during classroom lessons	3	6	7	14	1.93	1.05	Not Employed
7	use digital tools to support play-based learning	6	5	11	8	2.30	1.09	Not Employed
8	use videos, songs, or animations to teach children	4	7	7	12	2.10	1.09	Not Employed
9	combine digital tools with classroom activities (play, drawing, role play)	4	8	11	7	2.30	0.99	Not Employed
10	use digital tools to help children participate actively in learning	4	4	13	9	2.10	0.99	Not Employed
						2.43	1.04	Not Employed
Sectional Mean/SD								

Table 2 presents the digital pedagogical practices employed by teachers in pre-primary education in FCT, Abuja, with a sectional mean and standard deviation of 2.43 and 1.04 respectively. The analysis showed that teachers use digital tools to support play-based learning, recording a mean score of 2.30 and SD of 1.09. Similarly, teachers combine digital tools with classroom activities such as play, drawing, and role play, which also recorded a mean score of 2.30 and SD of 0.99. However, both mean scores fall below the benchmark of 2.50 and were therefore adjudged not employed. Further findings revealed that teachers use videos, songs, or animations to teach children, recording a mean score of 2.10 and SD of 0.99. Teachers also use digital tools to help children participate actively in learning with a mean score of 2.10 and SD of 1.09. In addition, the use of digital storytelling during classroom lessons recorded the lowest mean score of 1.93 and SD of 1.05. All the items were below the benchmark of 2.50, indicating low adoption of digital pedagogical practices among teachers. Conclusively, the sectional mean showed that digital pedagogical practices are not employed by teachers in pre-primary education in FCT, Abuja.

Research Question Three: What is the level of teachers' digital competence in integrating digital pedagogies in pre-primary education subjects such as literacy?

Table 3: Level of teachers' competence in integrating digital pedagogies in teaching numeracy in pre-primary schools

S/N	Level of teachers' competence in integrating digital pedagogies in teaching numeracy in pre-primary schools	4	3	2	1	Mean	SD	Decision
Teachers:								
12	confidently apply digital tools and resources while teaching numeracy concepts to pre-primary learners	9	9	4	8	2.63	1.17	High Level
13	have undergone relevant	8	2	9	11	2.23	1.25	Low

	Professional training on the use of digital pedagogical approaches in early childhood education								Level
14	incorporate digital technologies into numeracy teaching and classroom learning activities	2	7	10	11	2.00	1.00		Low Level
15	demonstrate willingness to adopt innovative digital strategies for improving numeracy instruction in pre-primary classrooms	9	6	7	8	2.53	1.22		High Level
	Sectional Mean/SD					2.35	1.16		Low Level

Table 3 presents the level of teachers' competence in integrating digital pedagogies in teaching numeracy in pre-primary schools in FCT, Abuja, with a sectional mean and standard deviation of 2.35 and 1.16 respectively. The analysis revealed that teachers confidently apply digital tools and resources while teaching numeracy concepts to pre-primary learners, recording a mean score of 2.63 and SD of 0.93, which indicates a high level of competence. The findings further showed that teachers demonstrate willingness to adopt innovative digital strategies for improving numeracy instruction in pre-primary classrooms, with a mean score of 2.53 and SD of 1.22, which also indicates a high level of competence. However, teachers were found to have a low level of competence in some areas. Specifically, teachers who had undergone relevant professional training on the use of digital pedagogical approaches in early childhood education recorded a mean score of 2.23 and SD of 1.25. Likewise, teachers' incorporation of digital technologies into numeracy teaching and classroom learning activities recorded a mean score of 2.00 and SD of 1.00, both of which fall below the benchmark of 2.50. Conclusively, the sectional mean indicated that teachers generally possess a low level of competence in integrating digital pedagogies in teaching numeracy in pre-primary schools in FCT, Abuja, despite showing confidence and willingness in the use of digital tools and innovative strategies.

Hypotheses

H0₁: There is no significant relationship between teachers' digital competence and the use of digital pedagogies in teaching at the pre-primary education level in the FCT.

Table 4: Test of Relationship between teachers' digital competence and the use of digital pedagogies

Variables	x	SD	r	Sig.	Decision
Teachers' Digital Competence	2.35	1.16	0.672	0.002	Rejected
Use of Digital Pedagogies	2.43	1.04			

Table 4 presents the test of relationship between teachers' digital competence and the use of digital pedagogies in pre-primary education in the FCT, Abuja. The analysis revealed that teachers' digital competence had a mean score of 2.35 with a standard deviation of 1.16, while the use of digital pedagogies recorded a mean score of 2.43 and a standard deviation of 1.04. The result further showed a correlation coefficient (r) value of

0.672, indicating a strong positive relationship between teachers' digital competence and the use of digital pedagogies. The significance value obtained was 0.002, which is less than the 0.05 level of significance. Based on this, the null hypothesis which stated that there is no significant relationship between teachers' digital competence and the use of digital pedagogies in teaching at the pre-primary education level in the FCT was rejected. This implies that teachers with higher levels of digital competence are more likely to employ digital pedagogical practices in teaching. Therefore, digital competence significantly influences the effective use of digital pedagogies among pre-primary school teachers in the FCT, Abuja.

Discussion of Findings

The study found out that digital devices are generally not utilized in pre-primary classrooms in the Federal Capital Territory (FCT), Abuja. The study showed that mobile phones were the only digital devices adequately utilized for teaching and learning activities, while tablets, computers, radios, televisions, and projectors were not effectively utilized in classroom instruction. This finding suggests that access to and utilization of digital technologies in early childhood education remain limited, despite the increasing emphasis on technology integration in teaching and learning globally. The relatively higher utilization of mobile phones may be attributed to their affordability, portability, and widespread ownership among teachers compared to other digital devices. This finding agrees with the study of UNESCO (2023), which reported that many developing countries continue to face challenges related to inadequate digital infrastructure, limited access to educational technologies, and poor funding for technology-based learning in schools. Similarly, Adu and Galloway (2015) found that the integration of digital devices in Nigerian schools remains low due to insufficient resources, inadequate electricity supply, and lack of institutional support. The finding also supports the work of Eze and Aja (2020), who observed that teachers in early childhood centres in Nigeria rarely use computers and projectors because such facilities are either unavailable or non-functional.

The study discovered that teachers do not employ digital pedagogical practices in pre-primary education in the FCT, Abuja. Specifically, teachers were found not to effectively use digital storytelling, digital tools for play-based learning, videos and animations, or digital tools that encourage active participation and classroom interaction among learners. This suggests that even when some digital devices are available, teachers may lack the pedagogical knowledge and practical skills required to integrate technology meaningfully into teaching and learning processes. Ertmer (2010) argued that teachers' beliefs, pedagogical orientations, and confidence significantly influence the extent to which digital pedagogies are adopted in classroom practice. Furthermore, Lawrence and Tar (2018) found that many Nigerian teachers still rely heavily on traditional teacher-centred instructional methods because they lack adequate exposure to innovative digital teaching strategies.

The study revealed that teachers possess a generally low level of competence in integrating digital pedagogies in teaching numeracy in pre-primary schools in the FCT, Abuja. Although teachers demonstrated confidence in applying digital tools and willingness to adopt innovative digital strategies, they lacked adequate professional training and showed limited integration of digital technologies into classroom learning activities. This indicates that teachers may have positive attitudes toward digital learning but are constrained by insufficient digital competence and inadequate professional development opportunities. This finding corroborates the work of Tondeur (2017), who reported that teachers' competence in technology integration is strongly influenced by

continuous professional training and institutional support. Likewise, Redecker (2017) explained that teachers require digital competence in areas such as digital resource creation, learner engagement, and technology-supported assessment to effectively implement digital pedagogies. The finding also supports the study of Nwosu and Ugwoke (2021), which revealed that many early childhood teachers in Nigeria possess limited technological competence due to inadequate training opportunities and lack of access to modern instructional technologies.

The hypothesis tested further revealed that there is a significant positive relationship between teachers' digital competence and the use of digital pedagogies in teaching at the pre-primary education level in the FCT, Abuja. This implies that teachers with higher levels of digital competence are more likely to utilize digital pedagogical practices effectively in classroom instruction. The finding highlights the importance of building teachers' technological capacity as a prerequisite for successful integration of digital pedagogies in early childhood education. This finding is consistent with the research of Falloon (2020), who found that teachers' digital competence significantly predicts their readiness and effectiveness in technology integration. Similarly, Instefjord and Munthe (2017) reported that teachers who receive adequate digital skills training demonstrate greater confidence and effectiveness in implementing digital learning practices in schools.

Conclusion

The study concluded that the use of digital devices and digital pedagogies in pre-primary schools in the FCT, Abuja is generally low. Teachers demonstrated limited competence in integrating digital technologies into numeracy instruction due to inadequate training and insufficient digital resources. However, the study established a significant positive relationship between teachers' digital competence and the effective use of digital pedagogies. Therefore, improving teachers' digital skills and providing adequate technological facilities are essential for enhancing digital teaching and learning in pre-primary education.

Recommendations

Based on the findings, the study recommends that:

1. Government and school authorities should provide adequate digital devices such as computers, tablets, projectors, and internet facilities in pre-primary schools to improve the utilization of digital technologies for teaching and learning activities.
2. Teachers should be regularly trained through workshops, seminars, and professional development programmes on the use of digital pedagogical practices such as digital storytelling, play-based digital learning, videos, and interactive teaching strategies.
3. Educational stakeholders should organize continuous digital competence training programmes for pre-primary teachers to enhance their skills, confidence, and ability to effectively integrate digital technologies into numeracy instruction.

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