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Digital Pedagogical Competence and Instructional Readiness among Pre-Service Social Studies Teachers in Kogi State, Nigeria

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Highlights:

Reveals using a descriptive survey with correlational design showed moderate level for digital pedagogical competence and high level instructional readiness among pre-service social studies teachers

Recommends that Colleges of Education should systematically integrate practical, subject-specific digital pedagogical training into the curriculum to better prepare pre-service social studies teachers.

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Abstract: The digital era has transformed learning, exposing children to vast information while also threatening cognitive skills like attention, critical thinking, and problem-solving. The enhancement of a child's cognitive holds the key to the child's future. Today a good parent and teacher want their children to succeed in school and thrive intellectually. They struggle to achieve and maintain the strong family structure that can withstand negative pressures so prevalent in our society, therefore, the importance of early enrichment activities that can help parents gain the skills that are so important to their child's future success cannot be overemphasized. Research has shown that a child's early life experiences and environmental surroundings are closely linked to cognitive enhancement and the foundation for future development. It is known that parents create the first learning environment for their children, and the parents are their child's first teachers. This Paper therefore seek to unravel what the parents and teachers should know and do to help this young school child enrich their brain through providing information and services that will aid in the children's physical, social, emotional, and intellectual development, in order to improve their learning and educational achievement. This could be realized through proper nutrition, good health condition, good exercises, and acquisition of language. A child should be assisted early enough in the cognitive enrichment activities for better performance that will leads to sustainable development.

Keywords*:* Parents, Teacher, Cognitive development, Digital era, and Sound education

Introduction

The rapid advancement of digital technologies has transformed educational practices globally, thereby reshaping the competencies required of teachers in the 21st century. In contemporary classrooms, effective teaching extends beyond mastery of subject content to include the ability to integrate digital tools and pedagogical strategies that enhance learning experiences. This has brought increasing attention to digital pedagogical competence, which emphasizes teachers' capacity to combine technological knowledge with pedagogical and content expertise for effective instructional delivery. Within teacher education, the development of such competence is particularly important for pre-service Social Studies teachers, as Social Studies instruction requires interactive, participatory, and value-oriented approaches that can be significantly enhanced through digital learning environments. Consequently, instructional readiness among pre-service teachers is increasingly linked to their level of digital pedagogical competence, especially in

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preparing them to meet the demands of teaching in the digital era (Redecker, 2017).

Digital pedagogical competence represents a multidimensional construct that integrates technological proficiency with pedagogical knowledge and content expertise. Mishra & Koehler (2016) stressed that it extends beyond mere operational skills in using digital devices to encompass the ability to design, implement, and evaluate technology-enhanced learning experiences that promote critical thinking, collaboration, and learner engagement. Frameworks such as the Technological Pedagogical Content Knowledge (TPACK) model underscore the interconnectedness of these domains, emphasizing that effective teaching in the digital era requires a seamless integration of technology, pedagogy, and subject content (Falloon, 2020). Scherer, Siddiq & Tondeur (2019) suggested that teachers who demonstrate high levels of digital pedagogical competence are better positioned to facilitate meaningful learning experiences and adapt instructional strategies to diverse learner needs.

In the context of teacher education, pre-service teachers occupy a strategic position as prospective implementers of educational innovations. Their preparedness to integrate digital technologies into classroom practice is a key determinant of the success of ongoing educational reforms. Readiness for digital instruction encompasses a combination of cognitive, affective, and behavioral attributes, including knowledge of digital tools, confidence in their use, positive attitudes toward technology integration, and the ability to apply such tools in pedagogically sound ways. Studies have consistently shown that digital competence significantly predicts teachers' readiness and willingness to adopt technology in instructional settings (Instefjord & Munthe, 2017). This predictive relationship underscores the importance of embedding digital pedagogical training within teacher education programmes to ensure that graduates are adequately equipped for the demands of modern classrooms.

Despite global advancements, the integration of digital technologies in education remains uneven, particularly in developing countries such as Nigeria. While national policies, including the National Policy on Education and ICT-in-Education initiatives, advocate for the infusion of technology into teaching and learning, the implementation of these policies has been fraught with challenges. These include inadequate infrastructure, limited access to digital resources, insufficient training opportunities for teachers, and systemic constraints within Colleges of Education (Ajani, 2024). Olurinola and Olugbade (2024) further revealed that many Nigerian pre-service teachers exhibit low to moderate levels of digital competence, which adversely affects their readiness to integrate technology into classroom instruction.

The challenge is particularly pronounced in the teaching of Social Studies, a discipline that plays a pivotal role in fostering civic competence, critical thinking, value orientation, and social responsibility among learners. Social Studies education inherently requires interactive, inquiry-based, and participatory teaching approaches, which can be significantly enhanced through the integration of digital technologies such as multimedia resources, simulations, virtual field trips, and collaborative platforms. When effectively utilized, these tools can transform abstract social concepts into concrete learning experiences, thereby improving student engagement and learning outcomes. However, in many Nigerian secondary schools and teacher education institutions, including those in Kogi State, Social Studies instruction is still largely characterized by conventional lecture methods, rote memorization, and excessive reliance on textbooks, with minimal learner

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participation. This traditional approach often makes the subject abstract and less engaging, thereby limiting students' critical thinking and practical understanding of societal issues. Consequently, the need for digital pedagogical competence among Social Studies teachers has become more urgent, as technology-driven instructional strategies can foster interactive learning experiences that are essential for meaningful Social Studies instruction in the digital era. Nevertheless, the successful integration of digital tools in Social Studies instruction is contingent upon the teacher's digital pedagogical competence. Where such competence is lacking, instructional practices tend to remain conventional, limiting the transformative potential of the subject (Oyelekan, 2021).

In Kogi State, Nigeria, teacher education institutions including colleges of education and universities are mandated to prepare pre-service teachers who can meet the evolving demands of the digital age. However, empirical studies on ICT utilization in educational institutions in Kogi State indicate that many of these institutions continue to experience significant barriers to effective technology integration. Studies have reported challenges such as inadequate ICT infrastructure, poor internet connectivity, irregular power supply, limited access to digital devices, and insufficient training opportunities for both lecturers and students (Onojah, 2022; Salawu & Abu, 2023). Similarly, research on teacher preparedness in North-Central Nigeria revealed that many pre-service teachers possess limited practical exposure to technology-driven pedagogy, thereby constraining their ability to effectively integrate digital tools into classroom instruction (Ajani, 2024). These institutional limitations continue to hinder the development of digital pedagogical competence among pre-service teachers in Kogi State. As a result, many graduates enter the teaching profession without the requisite digital skills, confidence, and pedagogical capacity required for effective instructional delivery in contemporary classrooms in subject areas like Social Studies that demand innovative pedagogical approaches.

Although several studies have examined digital literacy and technology integration in Nigerian education, there remains a paucity of empirical research that specifically investigates the predictive relationship between digital pedagogical competence and pre-service teachers' readiness for subject-specific instruction, especially within the context of Social Studies education in Kogi State. This is particularly critical for Year II NCE students who are on the verge of their mandatory teaching practice exercises, where instructional readiness is actively tested in real classroom settings. Despite their transitional position between pedagogical training and professional practice, limited empirical attention has been given to assessing whether these students possess the digital pedagogical competence required for effective Social Studies instruction. This gap in the literature limits the ability of stakeholders to design targeted interventions that can enhance teacher preparedness and improve instructional quality. Understanding how digital pedagogical competence influences readiness for teaching Social Studies is therefore critical for informing teacher education curriculum, guiding policy decisions, and strengthening the overall quality of education.

Against this backdrop, this study examines digital pedagogical competence and instructional readiness among pre-service Social Studies teachers in Kogi State, Nigeria. By establishing the nature and strength of this relationship, the study seeks to provide empirical evidence that can support the integration of digital pedagogy into teacher education programmes and contribute to the broader discourse on educational transformation in the digital era.

https://doi.org/10.68071/xfmvvk44

This study is anchored on the Technological Pedagogical Content Knowledge developed by Punya Mishra and Matthew J. Koehler in 2016. The TPACK framework explains the interaction between technology, pedagogy, and content knowledge in effective teaching and learning processes. The theory posits that effective classroom instruction in the digital era requires teachers to possess not only mastery of subject matter (Content Knowledge) and teaching methods (Pedagogical Knowledge), but also the ability to integrate technology appropriately into instructional practice (Technological Knowledge). According to the TPACK framework, meaningful teaching occurs at the intersection of these three domains. Teachers are expected to understand how technological tools can support pedagogical strategies and enhance the teaching of specific subject content. The framework therefore emphasizes that technology integration should not be treated as an isolated skill but as an integral component of instructional delivery. In the context of Social Studies education, teachers are required to combine digital technologies with inquiry-based, participatory, and value-oriented pedagogies in order to improve students' engagement, critical thinking, and understanding of societal issues.

The relevance of the TPACK framework to this study lies in its emphasis on digital pedagogical competence as a prerequisite for effective instructional readiness. Pre-service Social Studies teachers who possess adequate technological, pedagogical, and content knowledge are more likely to demonstrate confidence, preparedness, and competence in classroom instruction. Conversely, inadequate digital pedagogical competence may hinder their ability to effectively implement technology-enhanced teaching strategies during teaching practice and future professional engagement. Therefore, the framework provides an appropriate theoretical lens for understanding the relationship between digital pedagogical competence and instructional readiness among pre-service Social Studies teachers in Kogi State, Nigeria. Digital pedagogical competence refers to the knowledge, skills, attitudes, and abilities required by teachers to effectively integrate digital technologies into teaching and learning processes. It extends beyond basic ICT literacy to include the pedagogical application of technology for instructional delivery, classroom management, assessment, collaboration, and learner engagement (Falloon, 2020). In teacher education, digital pedagogical competence has become increasingly important due to the growing demand for technology-enhanced learning environments. Recent educational reforms globally emphasize that teachers must be digitally competent in order to function effectively in modern classrooms. UNESCO (2023) noted that teachers in the digital era are expected to possess competencies in technological integration, digital communication, digital assessment, and innovative instructional delivery. Consequently, teacher education institutions are increasingly under pressure to prepare pre-service teachers who can effectively integrate digital technologies into classroom instruction.

Instructional readiness refers to the preparedness, competence, confidence, and willingness of teachers to effectively carry out classroom instructional responsibilities. It encompasses mastery of teaching methods, lesson planning, classroom management, and the ability to utilize appropriate instructional resources. In contemporary education, instructional readiness also includes preparedness for digital and technology-enhanced teaching environments (Instefjord & Munthe, 2017). Among pre-service teachers, instructional readiness is particularly important because it determines their ability to translate theoretical pedagogical knowledge into practical classroom experiences during teaching practice exercises. Teachers who demonstrate high instructional readiness are

more likely to employ learner-centered instructional strategies, engage students effectively, and adapt to emerging educational innovations. Ajani (2024) investigated teachers' competencies in digital integration of learning contents in Nigeria using a descriptive survey design. The study found that many teachers possessed only moderate digital competence and faced challenges in integrating technology into instructional practice. The study recommended continuous professional development in digital pedagogy. However, the study focused on in-service teachers generally and did not specifically examine pre-service Social Studies teachers or instructional readiness, thereby creating a contextual gap for the present study.

Olurinola and Olugbade (2024) examined the impact of digital teacher training on Nigerian educators' digital pedagogy competence and confidence. Findings revealed that digital training significantly improved teachers' confidence and technological competence. Despite its relevance, the study concentrated mainly on teacher confidence and did not investigate the predictive relationship between digital pedagogical competence and instructional readiness among NCE students in Kogi State. Instefjord and Munthe (2017) analyzed digital competence in teacher education curricula across European institutions. The study revealed that although digital competence was recognized as important, its practical integration into teacher preparation programmes remained inadequate. While the study provided valuable insights into teacher education, it was conducted outside the Nigerian context and did not focus on Social Studies instruction, thereby limiting its applicability to the present study.

Tondeur et al. (2020) conducted a meta-analysis on enhancing pre-service teachers' technological pedagogical content knowledge (TPACK). The study found that practical exposure to technology integration significantly improved pre-service teachers' competence and readiness for classroom instruction. However, the study focused broadly on pre-service teachers without addressing the unique pedagogical demands of Social Studies education in Kogi State. Adams et al. (2025) investigated digital literacy and technological pedagogical content knowledge as predictors of pre-service science teachers' readiness for 21st-century instruction in Kwara State, Nigeria. Findings revealed a significant relationship between digital competence and instructional readiness. Although the study closely relates to the present research, it focused on science education rather than Social Studies and was conducted outside Kogi State, thereby leaving both disciplinary and geographical gaps. Scherer et al. (2029) conducted a meta-analysis on teachers' adoption of digital technology using the Technology Acceptance Model. Findings indicated that teachers' technological competence significantly influenced their willingness to integrate digital tools into instruction. However, the study emphasized technology acceptance rather than instructional readiness and did not examine pre-service teachers specifically

The reviewed studies collectively established that digital competence plays a significant role in technology integration and effective instructional delivery. However, existing literature has focused largely on in-service teachers, general digital literacy, teacher confidence, or technology acceptance, with limited attention given to pre-service Social Studies teachers in Colleges of Education. Furthermore, many of the studies were conducted outside Kogi State and did not specifically investigate Year II NCE students who are preparing for teaching practice exercises where instructional readiness becomes practically relevant. Thus, there exists a contextual, disciplinary, and empirical gap regarding the relationship between digital pedagogical competence

and instructional readiness among pre-service Social Studies teachers in Kogi State, Nigeria. The present study therefore seeks to fill this gap by examining digital pedagogical competence and instructional readiness among Year II pre-service Social Studies teachers in selected Colleges of Education in Kogi State

Research Questions

The following research questions were raised to guide this study.

i. What is the level of digital pedagogical competence among pre-service teachers in Kogi State, Nigeria?
ii. To what extent does the level of instructional readiness affect pre-service Social Studies teachers in Kogi State, Nigeria?

Methodology

This paper employed descriptive survey involving the correlation approach. T he population of the study comprised all Colleges of Education year II Social Studies Pre-service teachers in Kogi State, Nigeria. Two Colleges of Education in Kogi State out of three government owned colleges of Education were purposely selected for the study because they were in researchers' jurisdiction. Those two Colleges of Education were Kogi State College of Education, Ankpa (108 participants) and Federal College of Education, Okene, Kogi State (120 participants). Simple random sampling was used to select a total of 228 year two Social Studies students who participated in the study. The instrument used for data collection was a structured questionnaire titled: Digital Pedagogical Competence and Instructional Readiness Questionnaire (DPCIRQ). The instrument consisted of three sections: A, B, C. Section A: contained demographic information which includes gender, level, and institution type. Section B contains items measuring digital pedagogical competence (ability to integrate digital tools, design digital lessons, and use multimedia resources). Section C contained items measuring readiness for Social Studies instruction, including confidence, preparedness, and the ability to implement digital instructional strategies. The items were structured on a four-point Likert scale ranging from Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). To determine the level of digital pedagogical competence and instructional readiness, the mean scores were interpreted using the following decision rule: 3.50–4.00 = Extremely High Level, 2.50–3.49 = High Level, 1.50–2.49 = Moderate Level and 1.00–1.49 = Low Level. This criterion served as the basis for interpreting respondents' levels of competence and readiness in the study. The instrument was subjected to face and content validity by experts in Social Studies Education, Educational Technology, and Measurement and Evaluation. Their suggestions and corrections were incorporated to ensure clarity, relevance, and adequacy of the items in measuring the constructs under study. The reliability of the instrument was established using the Cronbach Alpha method. A pilot test was conducted using a sample of pre-service teachers outside the study area. The reliability of the instrument was determined using the Cronbach's Alpha method. The analysis yielded a reliability coefficient of 0.70 which indicated that the instrument possessed high internal consistency and was therefore considered reliable and suitable for the study. The researcher, with the assistance of trained research assistants, administered the questionnaire directly to respondents in their respective institutions. Respondents were given adequate time to complete the instrument, and a high return rate was ensured through follow-up. Mean and standard deviation were used to answer Research Question 1 (levels of competence and readiness). While, Simple linear regression analysis was used to answer Research Question 2 in order to ascertain

https://doi.org/10.68071/xfmvvk44

the level of instructional readiness among pre-service Social Studies teachers in Kogi State. All hypotheses were tested at a 0.05 level of significance.

Research Question 2: To what extent does the level of instructional readiness affect pre-service Social Studies teachers in Kogi State, Nigeria?

Results

Research Question 1: What is the level of digital pedagogical competence among pre-service teachers in Kogi State, Nigeria?

Table 1: Mean and Standard Deviation of Digital Pedagogical Competence

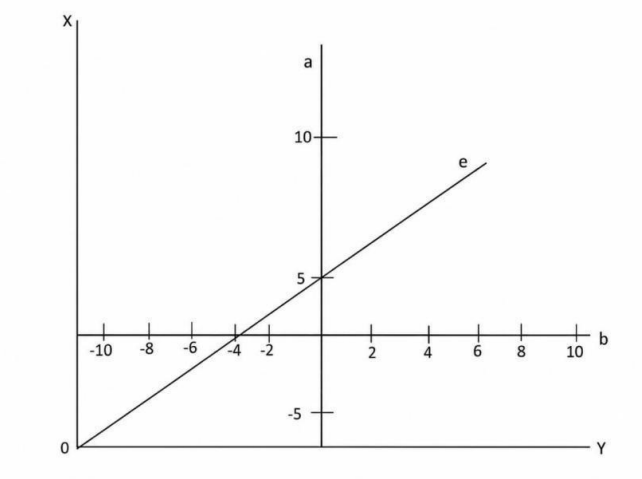
S/N	Items	$\bar{x}$	S/D	Decision
1	Ability to use digital tools for lesson delivery	3.12	0.68	High
2	Ability to design digital instructional materials	2.48	0.72	Moderate
3	Use of multimedia resources in teaching	3.05	0.70	High
4	Ability to integrate technology into pedagogy	2.47	0.72	Moderate
5	Ability to assess students using digital tools	2.46	0.80	Moderate
	Cluster Mean	**2.46**		**Moderate**

Table 1 shows that the overall (cluster) mean of 2.46 indicates a moderate level of digital pedagogical competence among pre-service teachers in Kogi State. While respondents demonstrated relatively strong abilities in using digital tools and multimedia resources, their competence in designing instructional materials, integrating technology pedagogically, and conducting digital assessments remains moderate. This suggests partial preparedness in digital pedagogy.

Regression Model

The regression model is expressed as:

$$Y=a+bX+e$$



Where:

- **Y** = Instructional Readiness
- **a** = Constant (Intercept)
- **b** = Regression Coefficient
- **X** = Digital Pedagogical Competence
- **e** = Error Term

The model assumes that instructional readiness is a function of digital pedagogical competence among pre-service Social Studies teachers in Kogi State, Nigeria.

https://doi.org/10.68071/xfmvvk44

Table 2: Simple Linear Regression Analysis of Instructional Readiness as it affects pre-service Social Studies teachers

Model	R	R^2	Adjusted R^2	Std	Error	F	Sig
1	0.64	0.41	0.40	0.52	172	35	0.000

Table 3: Regression Coefficient

Variable	B	Std	Error	Beta	t	Sig
(Constant)	1.12	0.21			5.33	0.000
Digital Pedagogical Competence	0.64	0.05		0.64	13.12	0.000

The regression analysis in Table 2 shows that instructional readiness affect pre-service Social Studies teachers (R = 0.64). The R^2 value of 0.41 indicates that 41% of the variance in pre-service teachers' readiness for Social Studies instruction is explained by their digital pedagogical competence. Furthermore, Table 3 reveals that digital pedagogical competence is a significant predictor of instructional readiness ($\beta = 0.64$, $p < 0.05$). This implies that an increase in digital pedagogical competence leads to a corresponding increase in instructional readiness. Therefore, digital pedagogical competence significantly predicts pre-service teachers' readiness for Social Studies instruction in Kogi State, Nigeria.

Discussions

The study revealed that pre-service teachers in Kogi State, Nigeria possess a moderate level of digital pedagogical competence. This finding suggests that while pre-service teachers demonstrate some familiarity with digital tools and basic instructional technologies, their ability to integrate these tools effectively into pedagogical practices remains limited. The moderate competence observed in areas such as digital lesson design, technology integration, and digital assessment indicate that exposure to technology alone does not automatically translate into pedagogical effectiveness. This finding aligns with the submission of Mishra and Koehler (2016) under the Technological Pedagogical Content Knowledge framework, which emphasizes that meaningful technology integration requires the intersection of technological knowledge, pedagogical knowledge, and content knowledge. It also corroborates findings by Falloon (2020) and Ajani (2024), who reported that many teachers in developing contexts possess basic digital skills but lack deeper pedagogical competence for effective classroom integration.

Also, another finding of the study is that instructional readiness affects pre-service Social Studies teachers. The strong positive relationship observed indicates that improvements in digital pedagogical competence are likely to enhance teachers' readiness for instructional practice. This finding provides empirical support for existing literature which posits that competence is a critical determinant of readiness and effective technology integration. Studies by Tondeur et al. (2020) and Scherer, Siddiq, and Tondeur (2019) similarly found that teachers' technological and pedagogical competencies significantly influence their adoption and use of digital tools in teaching. The implication of this finding is that readiness is not an isolated construct but is strongly dependent on the level of competence acquired during teacher training. However, the findings highlight a critical gap between competence and readiness, suggesting that while pre-service teachers in Kogi State are willing and

https://doi.org/10.68071/xfmvvk44

psychologically prepared to embrace digital teaching, their technical and pedagogical capabilities require further development. This gap has significant implications for teacher education institutions, as it points to the need for structured and sustained digital pedagogy training. Bridging this gap is essential for ensuring that future Social Studies teachers are not only ready in disposition but also competent in practice, thereby enhancing the quality of instruction and learning outcomes in the digital era.

Conclusion

This study examined digital pedagogical competence and instructional readiness among pre-service Social Studies teachers in Kogi State, Nigeria. The findings revealed that although pre-service teachers demonstrated a moderate level of digital pedagogical competence, they exhibited a relatively high level of readiness for instructional practice. This suggests that while they possess the willingness, confidence, and positive disposition toward integrating digital tools into teaching, their practical ability to effectively apply such tools pedagogically is still developing. More importantly, the study established that instructional readiness affects pre-service Social Studies teachers. This indicates that readiness for teaching in the digital era is largely dependent on the level of competence acquired during teacher training. Consequently, the ability of pre-service teachers to deliver effective, technology-enhanced Social Studies instruction is closely tied to how well they are equipped with the necessary digital pedagogical skills.

Recommendations

Based on the findings of the study and the paper recommends that:

1. Teacher education institutions in Kogi State and Nigeria at large should systematically integrate digital pedagogical training into their curriculum. This should go beyond basic ICT literacy to include practical and subject-specific applications for Social Studies instruction in order to improve the digital pedagogical competence of pre-service teachers.
2. Lecturers and instructors in Colleges of Education should be provided with continuous professional development programmes focused on digital pedagogy. This will ensure that teacher educators possess the required competence to model effective technology integration and adequately prepare pre-service teachers for instructional practice in the digital era.

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